APFNet

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Asia-Pacific Network for Sustainable Forest Management and Rehabilitation

EVALUATION REPORT

Demonstration of Sustainable Upland Agroforestry Systems in Chinese Taipei

(Project Number: 2011P1/6-CTN)

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Abbreviations

APEC: Asia Pacific Economic Cooperation Organization

APFNet: Asia-Pacific Network for Sustainable Forest Management and Rehabilitation

TFRI: Taiwan Forestry Research Institute

TFB: Taiwan Forestry Bureau

CFA: Chinese Forestry Association (Chinese Taipei)

1. EXECUTIVE SUMMARY

The Terminal Evaluation of APFNet funded project *Demonstration of Sustainable Upland Agroforestry Systems in Chinese Taipei* has been carried out over 12 working days since October, 2013, with seven of these days (November 17-23, 2013) field visiting the project sites and sites relevant with agroforestry practices in Chinese Taipei. The evaluation mission includes desk work meetings with project partners and field visit, and the assessment and results presented in this evaluation report developed by the evaluation team.

Overall, all activities of this 2-year project have been conducted at the schedule and all objective are achieved. The project's goal conforms to APFNet's objectives and priorities as in strengthening sustainable forest management and improving socioeconomic benefits. The project team has paid much attention to the project management and project expenses are reasonable and under strict financial regulation.

This project has successfully demonstrated that the agroforestry systems can be sustainable and adaptable in Chinese Taipei. The three demonstration sites can well disseminate the agroforestry technologies which are ready to duplicate to adjacent areas by core farmers and/or communities who are leaders in vicinity areas.

The close cooperation among stakeholders (research team, farmers, communities and industries) is a successful example for comprehensive agroforestry system. Under this model, the burden of government can be reduced. Moreover, the idea of participative management has applied into the executive process of the project, which facilitated the smooth project implementation.

The project team has developed a framework of criteria, which needs to be further verified and improved with research data and will be helpful for evaluating the sustainability of agroforestry systems. The existing infrastructures and research results will be very important technical support for agroforestry development decision-making in Chinese Taipei. The value has been recognized by the administrative authority. Constantly technical supports and suggestions to participating farmers are essential to maintain the study sties. The project team's follow-up projects may ensure the sustainability of the project achievement.

Although agroforestry is currently not encouraged or allowed in upland area in

Chinese Taipei due to its complicated history and background, continuous research is necessary to provide needed information for policy making in the future.

2. INTRODUCTION AND EVALUATION STUDY APPROACH

This report was contracted through APFNet as an evaluation of the project "Demonstration of Sustainable Upland Agroforestry Systems in Chinese Taipei, which was funded by APFNet. From October, 2013, the Evaluation team carried out a Terminal evaluation of the project. One visit was made to Chinese Taipei from November 17-23, 2013 to consult with people involved in the project and participate in meetings. During this time the following activities were carried out:

1. Desk work of reviewing project relevant documents (Annex 1).
2. Project terminal evaluation meeting in Chinese Taipei on November 17, 2013 (Agenda in Annex 2)

   Participators:
   Yue-hsing Huang, the Director General (DG) of TFRI; Tao-sheng Li, the DG of Chinese Taipei Forestry Bureau, Chinese Taipei; the team members of TFRI and partners including local framer and industry representatives, and the APFNet Terminal Evaluation members**.**
3. Field visit to project sites in Chinese Taipei from November 17-23, 2013.
4. Interviews with project stakeholders to acquire information and data in terms of the progress, issues encountered, outcomes and achievements.
5. Developing Terminal Evaluation Report.

Based on the information gained through this information gathering process, this report and assessment is presented. The Terminal Evaluation Plan is included as Annex 3.

3. PROJECT DESIGN

3.1 APFNet requirements

The establishment of the APFNet, proposed by China and co-sponsored by Australia and the United States, was agreed by the 15th APEC Economic Leaders' Meeting in September 2007 in Sydney. In "Guidelines for Project Management" (APFNet 26 February 2012), APFNet projects aim to summarize, demonstrate and disseminate best practices in sustainable forest management and rehabilitation in the Asia-Pacific region to fulfill the three main objectives of APFNet as follows:

1. To promote forest rehabilitation, reforestation and afforestation to help to achieve the goal of *increasing forest coverage in the APEC regions by 20 million hectares of all types of forests by 2020.*

2. To strengthen sustainable forest management, improve forest quality, increase carbon sequestration, and mitigate climate change.

3. To enhance biodiversity conservation and improve the productivity and socioeconomic benefits of forest ecosystems.

All APFNet projects should be in conformity with APFNet's objectives and priorities and relevance to the submitting country's policies. The goal of this project is well fit in APFNet's objectives.

3.2 Project design

The project design presented here is a summary of the design stated in the Project Proposal which is approved by APFNet in October, 2011. The project was run for two years from September 1, 2011.

Development objective: To develop and demonstrate the sustainable agroforestry systems adaptable in upland areas.

Impact indicators:

1. At least 2 agroforestry systems for uplands will be provided.
2. At least 2 demonstration sites will be established for inspection.

Specific Objectives:

1. To develop several different agroforestry management systems to cope with different demands of crop planting and afforestation: According to the choice of crop and tree species, the purpose of land owners and the natural condition of the area, various agroforestry systems and management strategies will be developed in this study. A good agroforestry system should not only achieve sustainability in land use, but also fulfill the needs of the local people.

2. To demonstrate the ability of these systems in preventing the destructive landslides and massive surface erosions on cultivated uplands: As huge landslides and massive erosions occurred frequently in upland areas in Chinese Taipei, awareness of the need for soil conservation has arisen. Interplanting trees in farms may control erosion through increasing soil cover, providing hedgerow barriers, stabilizing earth structures and etc.

3. To develop the criteria and indicators for evaluating the sustainability of such agroforestry management systems: One of the most important purposes of developing agroforestry systems in this study is to accomplish a sustainable land-use system. Important criteria and indicators for sustainable may include the evaluation on biological diversity, forestry and crop products, healthy ecosystems, soil and water resources, carbon dioxide sequestration and etc.

4. To encourage the communities of mountain villages to participate in the development of new agroforestry system(s) and take part in the dissemination of new technologies: Not only individual farmers and stewards of natural resources execute the new agroforestry system(s), people from mountain villages need to know the system(s) and encourage related people to participate in some workshops that will be held in the next two years. Linking individual and communities actions to national concerns and achieving sustainable land use becomes important.

Expected Outputs:

Output 1: at least 2 agroforestry management systems, the criteria and indicators for evaluating the sustainability of such agroforestry management systems will be developed by TFRI.

Output 2: to set up 3 demonstration areas for verifying the ability of soil and water conservation of these agroforestry systems, will be carried out by TFRI, TFB and CFA.

Output 3: to foster 3 technical teams to be organized by farmers of village communities in uplands for technology dissemination, will be carried out by TFRI and CFA.

Target Area:

The field study and demonstration sites were planned in the public forest area, the aboriginal reserves, or private upland farms in Chinese Taipei. Near 77% of forest areas is belonging to the public forest area. The majority of aboriginal reserves are located in upland area. When aboriginal people work on their reserve areas, there are special regulations which are usually more flexible to fit the tribe's traditions. Generally, other people's activities on upland areas are more restricted for natural resources protection reason.

Farmlands of betel nut and tea are the main target this study. Firstly, betel nut and tea farms occupy majority of upland agricultural areas. In 2009, betel nut and tea farm areas were 49,093 ha and 14,855 ha, respectively. Secondly, the prices of both betel

nuts and tea are dropping gradually every year since cheap products are imported. As a result, some farmers are considering changing their crops of betel nut or tea to other crop(s) or even planting trees.

Finances:

The overall Budget is USD 537,000, out of which:

- USD 400,000 of the overall budget is provided as a grant by the APFNet;
- USD 137,000 is from the counterpart contribution, comprising USD 131,000 in cash and USD 6,000 in kind.

4. PROJECT IMPLEMENTATION

4.1 Project activities

The Project Logical Framework which summarizes the project's goals, objectives, expected outputs and activities is replicated in Annex 4 from Project Proposal. By the end of the project (August 2013), the project manages to complete implementation. The anticipated and actual implementation completion schedule as listed in the project Completion Report is given in Table 1. A list of important activities was shown in Annex 5.

Table 1 Implementation schedule (scheduled versus actual)

Outputs & activities	Completion time		Key points of the results achieved (qualitative or quantitative)	
	Anticipated	Actual	Anticipated	Actual
Output1				
Activity 1.1	August 2013	August 2013	Establishing 3 study sites	Established 5 study sites
Activity 1.2	August 2013	August 2013	Data collection and analyses	Data collected and analyzed
Activity 1.3	August 2013	August 2013	Model simulation	Model simulation
Activity 1.4	June 2013	July 2013	3 training tours	3 training tours
Output2				
Activity 2.1	August 2012	August 2012	Income analyses and land productivity evaluation	Income analyses and land productivity evaluation

Activity 2.2	August 2013	August 2013	3 soil and water conservation demonstration areas	3 soil and water conservation demonstration areas
Output3				
Activity 3.1	June 2012	March 2012	Holding 1-2 seminars	Held 2 seminars
Activity 3.2	August 2013	August 2013	Organizing 2-3 technical teams	Organized 2 technical teams
Activity 3.3	August 2013	August 2013	Setting up 2 demonstration sites	Set up 3 demonstration sites

4.2 Project expenditure

The following table adapted from the Completion Report gives a summary of the expenditure to the end of the project (except the last quarter) and the variance rate between of planed and actual expenses.

Table 2 Details of project expenditure by category (September 1, 2011 to May 31, 2013)

Expenses (USD)	**APFNet Grant**			**Counterpart Fund**		
	Anticipated	Actual	Variance rate (%)	Anticipated	Actual	Variance rate (%)
Project staff cost	109,200	104,704	4.1	78,850	78,550	0.4
Travel and related cost	180,138	172,311	4.3	7,800	8,661	-11.0
Meeting and training cost	16,393	15,265	6.9	4,590	2,995	34.7
Field activities cost	44,140	44,869	-1.7	19,200	19,200	0
Publication & Dissemination cost	2,500	1,807	27.7			
Office Operation cost	31,445	32,680	-3.9	2,520	2,739	-8.7
Procurement	101,230	107,522	-6.2	11,520	12,485	-8.4
Monitoring, evaluation and audit cost	2,525	1,644	34.9			
Other (Balance of the 1st quarter)		1,107			352	
TOTAL	**344,426**	**341,611**	**1.1**	**121,960**	**121,891**	**0.3**

5. FINDINGS AND SUGGESTIONS

5.1 General findings and suggestions

Project Design:

Findings:

1. This project provided Chinese Taipei a practical and sustainable management approach on upland areas through the establishment of agroforestry system demonstration and the development of sustainability evaluation.

2. According to the devious history of Chinese Taipei agroforestry development, to develop a tool of assessing the sustainability of the agroforestry models is very important for supporting the decision-making on the development of agroforestry.

3. The close cooperation among stakeholders, including research team, farmers, communities and industries, is a very effective and sustainable way to establish study sites.

Suggestions and comments:

1. To make future explanation on the logic relationship of the finished activities and objectives and goal of this project, such as the linkages among the selection of different plant models, the pilot monitoring and research, the training courses and workshops, and its contribution to the objectives and goal.

2. Participation of different stokeholds is the essential driver for achieving the objectives. The close cooperation among stakeholders (research team, farmers, communities and industries), which can reduce the burden of government, is highly recommended for future studies. Still, the government should take the responsibility of monitoring, such as fertilizer pollution and pesticides residual test.

3. Since interplanting trees with crops will change pest and disease ecology on farms, more research on pest and disease and control strategy on agroforestry is strongly recommended. The residual of pesticide is another important issue which should be paid attention.

4. Reviewing the background, history and status of agroforestry development in Chinese Taipei will be helpful for both of assessing the goal of this project and promoting the decision-making support.

5. What is the relationship of those research works (or sites) on the developed agroforestry models and the new established models? How can we get the balance between the 4 objectives and to achieve the goal of the project?

Project Implementation:

Findings:

1. The main development object of this project is to develop and demonstrate the sustainable agroforestry systems adaptable in upland areas in Chinese Taipei. Five types of agroforestry management systems which cope with demands of different stakeholders have been developed.

2. The idea of participative management has been applied into the executive process of the project, which facilitate the project was smoothly implemented.

3. The existing infrastructures and research results have been used to support this project, and which is very helpful for achieving the goal of the project, and which will be very important technical support for agroforestry development decision-making in Chinese Taipei.

4. The project team has developed a framework of criteria categorizing into three main themes which are environment, economy and society, and more than 30 indicators are developed for these three criteria respectively. The criteria and indicators will be helpful for evaluating the sustainability of agroforestry systems.

Suggestions and comments:

1. To establish comprehensive and practical criteria and indicator (C/I) for assessing the sustainability of agroforestry in Chinese Taipei, more study and discussion is necessary in future continuous project. Indicators may be adjusted after collecting more data for a longer period of time. The quantitative baseline or standard at both of project level and Chinese Taipei level for different types of soil and water control system or different agroforestry systems in Chinese Taipei is necessary for most of the indicators, and some research results from the project can be prospected. The technical report should make a simple description on how the C/I were developed. What is the rationale and approaches to measurement for every indicator, which should be very important for achieving the goal? For example, it will be a unique tool for sustainable agroforestry management at whole Chinese Taipei level. The rationale and approaches to measurement should be also developed and attached for every indicator, on which, a completed framework of C/I for objective 3 of this project can be identified, and the sustainability of the

agroforestry system in Chinese Taipei can be clearly explained. Although the duration of this project is only two years, a simple experimental analysis/application test based on the data from this project will be very helpful for identifying if or not the C/I will work efficiently? Some indicators, e.g. carbon leakage, reasonable land use plan, and unit production cost, are not clear enough to understand well.

2. The mechanism or actions to maintain the project sustainably, especially the study sites, should be taken as soon as possible. Constantly technical supports and suggestions to participating farmers are essential to maintain the study sties.

3. Taiwan Forestry Bureau was one of the project partners. However, it seems TFB did not involve in the project implementation as planed in the original project proposal. It would be suggested that a closer cooperation between TFRI and TFB as which will facilitate and benefit the development of agroforestry in Chinese Taipei.

Project Management:

Findings:

1. Generally, the project was well managed and implemented smoothly following the approved proposal and the work plan. All activities have been conducted at the schedule. All objectives were achieved.

2. The project team has paid much attention to the project management, including good documents, data, experimental sites and reports, and financial issues, etc. Project audit report is provided and expenses are generally reasonable.

3. A Steering Committee for the project (PSC) was established from the onset of project for supervision project implementation and following project work plan. The PSC meeting was held each year, i.e. at inception stage and midterm.

4. The EA produced six Quarterly Progress Reports and a midterm report between December 2011 and June 2013. Such reports proved useful in identifying some of the implementation issues for this review.

Figure 1 Purchase documents and receipts were presented by TFRI Accounting and Statistics Office in the summary meeting.

Suggestions and comments:

1. There was a very prescriptive internal control environment over expenditure/cash disbursement system. Since all government departments of Chinese Taipei have to follow very restricted regulations and prescriptive on procurement, such as Government Procurement Act, a third party audit of the project may be redundant.

2. Although a PSC was established, only two meetings were held during the project implementation. The PSC showed somewhat a weak monitoring role. As a result, TFRI took most responsibility on regular project supervision. It is reasonable and practical, since TFRI is a well-organized and experienced governmental research institute for over a century.

3. No project office was established by the executing agency. According to our experiences, it is a very common situation in Chinese Taipei. Nevertheless, a light sight on the project daily management, such as the normative financial management and training workshop materials, were provided in the summary meeting on November 22. It is acceptable as long as the executing agency keep all project relevant documents and equipment well organized.

4. The project may hire consultants to obtain professional advice from experts at varied field if it is financially affordable. Experienced local or overseas experts sometimes could provide significant inputs and help the project team think progressively and innovatively.

Project Output:

Findings:

1. This project has successfully demonstrated that the agroforestry systems can be sustainable and adaptable in Chinese Taipei. The three demonstration sites can well disseminate the agroforestry technologies which are ready to duplicate to adjacent areas by core farmers and/or communities who are leaders in vicinity areas.

2. The agroforestry have being exploring for a long time at both of administrative authority level and the scientific research level, and also adapted by local communities in diverse manner and in small scale in Chinese Taipei, and such is the practical attitude, the attitude of seeking truth from facts. But clearly, no common consensus has been achieved. When it is unable to get policy approval, it is difficult for the project team to address the issue of agroforestry.

3. Due to the restrictions of laws/regulations in Chinese Taipei, no study site was set on public lands where are the most controversial area of agroforestry. All study sites in this project are on public land for agricultural or animal husbandry purposes or on private land. However. The research results from public land for agricultural or animal husbandry purposes or on private land should be able to provide a lot useful information on developing sustainable agroforestry.

4. The project has encouraged more people to go back from cities to their hometown in the upland village, especially in aboriginal communities. In the long run, the gaps between the city and countryside can be reduced and it may also solve many social problems.

5. Decision-making support will be prospected output of the project, for example, to change the policy on developing the agroforestry in public forest area of Chinese Taipei.

6. Capacity building for the local farmers will grant to maintain the sustainability of the project.

Suggestions and comments:

1. Although agroforestry is currently not encouraged or allowed in upland areas in Chinese Taipei due to its complicated history and background, continuous research is essential to provide needed information for policy making in the future.

2. It necessary and urgent for Chinese Taipei to development a tool of assessing the sustainability of agroforestry, and Chinese Taipei lack of capacity building of sustainable agroforestry development, including the policy review, development of criteria and indicators, and more different models suitable for different forest areas and local communities, etc. So another continuous international or outside project, for example, APFNet, FAO, etc. on agroforestry is helpful.

3. Common consensus of the development of agroforestry among different groups in Chinese Taipei is an important issue in the future. Before making new policy about agroforestry, more discussion and communication among different groups may lead to an agreement faster.

4. The project team is suggested to slightly modify the Completion report and Technical report according to the comments and suggestions from Terminal Evaluation team.

5.2 Findings and suggestions by site

Pinglin study site:

Figure 2 Informative sign at Pinglin demonstration site.

Findings and Comments:

1. The pilot density experiment by *Cinnamomum kanehirae*, interplanted in Pinglin's tea garden at different densities (2x1.5 m, 3x3 m, 4x4 m) has shown that the production and environments may be different after a few years.

2. Due to the good cooperation among the research team, farmer and the industries, the land owner is willing to take good care of the valuable interplanted trees and maintain the study site.

3. But 1) *Cinnamomum kanehirae* might replace the tea in a few year, which will confuse the idea of agroforestry at this site. 2) the site is need more canopy control management, such as thinning. Continuously technical supports of research team at this site are suggested.

Yuchi study site:

Figure 3 Informative sign at Yuchi demonstration site.

Findings:

1. Very normative *Pinanga salicifolia* + *Cinnamomum kanehirae* model, which consist of different density by thinning or clearcutting betel nut trees, although the current reforestation reward policy in Chinese Taipei, all crops have to be removed before reforestation. Which also cater to the farmer's need of trying to change their crops of betel nut to other crop(s) or even planting trees to face the change of market of betel nut, even to transform their local industry or business which will be possible to help them improve their low-income, labor intensive, and/or environmental unfriendly agricultural land. So this model is welcomed by the land owner.

2. The landholder of this study site was the General Secretary of Yuchi Community Association, who plays an important role on promoting agroforestry concept in local community through the community association, and which is the base of sustainable managing this kind of agroforestry model.

3. To sustainable developing this site, the landholder is planning to develop new products of *Cinnamomum kanehirae*, such as *Cinnamomum kanehirae* seedings,

Cinnamomum kanehirae essential oil, and *Antrodia camphorate*. The *Cinnamomum kanehirae* forest may also attract more guests to stay in their B&B.

Suggestions:

1. To established a more stable cooperative mechanism to maintain this study site.
2. To strength the monitoring, control, and study on the dynamic process of the sites to show scientifically why it will be valuable for promoting the development of agroforestry in Chinese Taipei.

Alishan agroforestry (2 sites):

The two sites visited in Alishan are two special cases of agroforestry systems on public lands which are temporally permitted by TFB. These cases would help the Terminal Evaluation team to understand some current status of agroforestry in the field in Chinese Taipei.

Figure 4 *Cryptomeria fortune* and *Wasabia japonica* agroforestry system in Alishan.

Findings:

1. Both of *Calocedrus formosana*+tea and *Cryptomeria fortune+Wasabia japonica* in Alishan are good models of agroforestry planted by ground afforestation, which has

showed that agroforestry is a valuable and prospective type of forest management or land use in public forest area in Chinese Taipei.

2. Agroforestry currently temporally exists by special regulations on some part of public forest area as a compromise between farmers' demand and government policy. This project can provide important support for agroforestry development decision-making in the future.

Wushow agroforestry site:

Wushow agroforestry site is one of TFRI research team's long-term agroforestry monitoring sites since 2010 before implementing this APFNet project.

Figure 5 *Ginkgo biloba* and tea interplanting agroforestry system in Wushow Tea Garden.

Findings:

1. As an existed long-term study site, *Ginkgo biloba* + tea in Wushow Tea Garden is a successful water and soil conservation experiment site. The research results will efficiently support the objectives and goal of this project, especially the development of criteria and indicators to assess the sustainability of agroforestry.

2. A good example of combination of agroforestry and tourism. This area is now famous of Gingko trees scenery, especially when leaf turning yellow in fall. Tourists who come to see Gingko trees will also purchase tee products and Gingko leaf tea.

3. Agroforestry was once encouraged around Wushow area in 1990s. However, it is now banned since the change of forestry policy. A sound policy should be made to avoid conflictions in the future.

Suggestions:

1. The research team has developed easy and low-cost method to monitor soil and water erosion. This method can be installed at other study sites to obtain more useful scientific data.

2. Based the results of these sites to formulate the approaches of methodologies to measurement of indicators.

3. To make independent dynamic records on the productivity or biomass and quality of tea at two sites, and to make comparative analysis with the pure tea garden there, which will be very constructive and scientific data for decision-making.

6. Preliminary impact and sustainability of the project

Impact:

The duration of the project is relatively too short to actually change any law in Chinese Taipei. However, the value of this project has been recognized by the administrative authority by the speech of Tao-sheng Li, the DG of TFB. He appreciates very much the excellent exploring on the development of agroforestry by this project based on the past experiences in Chinese Taipei. Although at the time of this review no agroforestry-related policy has been changed, TFB has begun discussing to approve the policy on facilitate the moderate development of agroforestry in public forest area of Chinese Taipei.

It is good to see the project team initiated cooperation with both international and local experts in agroforestry through many ways, such as training tour visits, attending APFNet annual meetings, and holding international conference. This would benefit agroforestry research in Chinese Taipei.

More farmers realized the necessity and possibility of sustainable management on their farm. Except cooperating farmers/landowners, many other farmers are

interested in changing their farm into agroforestry system in a sustainable way after attending workshops or meetings in this project.

Sustainability:

The design of this project is applicable for project sustainability after the termination of APFNet funding. The study sites may be used for demonstration as well as for collecting scientific data for many years. Extension of sustainable agroforestry systems in Chinese Taipei is expected to occur gradually afterwards. However, making agroforestry friendly policy/regulations will be an essential in the foreseeable future.

The demonstration sites in this project are key roles on promoting agroforestry in the future in Chinese Taipei. Therefore, it would be important to sustain those demonstration sites. It should not require large amounts of funding to support the sites. The follow-up project planned to be carried out by TFRI will be able to cover this part. Moreover, during our interview, the landowners/farmers were still highly interested in maintaining the study sites and cooperating with TFRI study team. The follow-up project also will carry on promotion and assisting local community programs.

To obtain more scientific data for establishing sustainability criteria, long-term monitoring on all existing study sites is recommended.

Annex 1 List of Reports and Documents of "Demonstration of Sustainable Upland Agroforestry Systems in Chinese Taipei" Project

Name	**Date**	**Category**
Project Proposal	January 2011	Technology
Project Agreement	August 2011	
Inception Workshop Handbook	October 2011	Output
Overall plan (September 2011-August 2014)	December 2011	Technology
Project Work Plan- Project Year 1 (September 2011- August 2012)	December 2011	Technology
Project Progress Report- Quarterly (September 2011- November 2011)	December 2011	Output
Project Progress Report- Quarterly (December 2011- February 2012)	March 2012	Output
Project Progress Report-Quarterly (March 2012- May 2012)	June 2012	Output
Project Progress Report-Midterm Progress Report (September 2011- August 2012)	September 2012	Output
Project Work Plan- Project Year 2 (September 2012- August 2013)	October 2012	Technology
Tea –making Process at Pinglin (video)	October 2012	Output
Mid-term Workshop Handbook	October 2012	Output
Project Progress Report- Quarterly (September 2012- November 2012)	December 2012	Output
Agroforestry Tree Tending	January 2013	Output
Agroforestry Products –*Cinnamomoum osmophloeum* Hydrosol and Soap Producting Handbook	January 2013	Output
Management and Development Potential of *Cinnamomoum osmophloeum*	January 2013	Output
Biology and Management of *Cinnamomum kanehirae*	January 2013	Output
Project Progress Report- Quarterly (December 2012- February 2013)	March 2013	Output

Name	Date	Category
Introduction of Tree Pest Control in Agroforestry	May 2013	Output
Introduction of Tree Disease Control in Agroforestry	May 2013	Output
Project Progress Report-Quarterly (March 2013- May 2013)	June 2013	Output
Symposium Proceedings of 2013 International Symposium on Agroforestry	August 2013	Output
Project Completion Report	October 2013	Output
Technical Report	October 2013	Output

Annex 2 Project Terminal Evaluation Meeting Agenda

"Demonstration of Sustainable Upland Agroforestry Systems in Chinese Taipei"

Date ： 2013.11.18

Venue： 3F Meeting room, Administration building, Taiwan Forestry Research Institute, Taipei, Chinese Taipei.

Time	Topic	
8:40 - 9:00	Registration	
9:00 - 9:15	Opening Ceremony Director General of Taiwan Forestry Research Institute - Yue-Hsing Huang Director General of Taiwan Forestry Bureau - Tao-Sheng Lee Director of Project management, APFNet -Qian Lu	
Time	Speaker	Topic
9:15 - 9:45	Fen-Hui Chen (TFRI)	"Demonstration of Sustainable Upland Agroforestry Systems in Chinese Taipei" project final report
9:45 - 10:10	Jaung-Pey Lin (TFRI)	Effect of Agroforestry Management on Soil and Water Conservation on Upland
10:10 - 10:30	Tea Break	
10:30 - 10:55	Chung-Fon Chen (Yuchi study site)	The Advantage and Dissemination of Betel Nut Palm and *Cinnamomum kanehirae* Interplanting System in Yuchi Community
10:55 - 11:20	Chen-Hon Huang (Kalala study site)	The Expectation of Developing Betel Nut Palm, Coffee and *Cinnamomum osmophloeum* Agroforestry System in Aboriginal Community
11:20 - 11:45	Su-Cheng Huang (Yiengu Environment Engineering Company)	The Benefit of Industry Investment on Agroforestry Management and Community Sustainable Development
11:45 - 12:00	Discussion	
12:00 - 13:30	Lunch Break	

Annex 3 Terminal Evaluation Plan

-Demonstration of Sustainable Upland Agroforestry Systems in Chinese Taipei-

1. Background

Chinese Taipei has lush and diverse forests which occupied 58.5% of the island area. However, upland area is vulnerable and unstable, especially huge landslides and debris flow disaster happened in upland area frequently in recently decades. In 2011, APFNet supported a project entitle *Demonstration of Sustainable Upland Agroforestry Systems in Chinese Taipei* through Taiwan Forestry Research Institute (TFRI) to develop and demonstrate the sustainable agroforestry systems adaptable in upland areas of Chinese Taipei. Through a 2 years duration, the project aims to 1) develop several different agroforestry management systems to cope with different demands of crop planting and afforestation; 2) demonstrate the ability of these systems in preventing the destructive landslides and massive surface erosions on cultivated uplands; 3) develop the criteria and indicators for evaluating the sustainability of such agroforestry management systems; 4) and to encourage the communities of mountain villages to participate in the development of new agroforestry system(s) and take part in the dissemination of new technologies.

2. Role and responsibility

The evaluation team will assess project performance and the implementation of planned project activities and planned outputs against actual results, as well as the impact and sustainability of the project, including:

- Development of TE Plan as the foundation for evaluation in team work and consulting APFNet and Executing Agency;
- Conduction of evaluation, including desk work, field visit to project sites in Chinese Taipei from November 17-23, 2013, interviews with project stakeholders to acquire information and data in terms of the progress, issues encountered, outcomes and achievements;
- Development and dissemination evaluation result and report.

Prof. Wang Yanan and Prof. Xiao Wenfa is the key member of the Terminal Evaluation (TE) team. Prof. Wang Yanan (the team leader) is responsible for coordinating the TE

mission in a whole process with necessary support from APFNet and the project Executing Agency, as well as leading in TE plan and TE report drafting with support and cooperation from Prof. Xiao Wenfa.

Specific tasks for each TE team member are:

- Both Prof. Wang and Prof. Xiao will responsible for evaluating the performance of project management, finance and dissemination against the project agreement and work plans.
- Prof. Wang focuses on evaluating the response of project stakeholders and the influence on policy making;
- Prof. Xiao will focus on evaluating the agroforestry management system design and the criteria/indicators for evaluating sustainability.

Other aspects, such as APFNet project procedure review, documentation check and dissemination collection will be conduct by two experts of the delegation invited by APFNet, who are also responsible for providing assistance to the TE mission.

3. Evaluation scope

- Evaluate the project design and agroforestry management systems;
- Assess the criteria and indicators for evaluating the sustainability of such agroforestry management systems;
- Evaluate stakeholders' awareness of agroforestry system;
- Evaluate the impact of agroforestry system on policy making, and its social /economic contribution;
- Examine the sustainability of project outputs;
- Assess the basis of replication of successful project outcomes.
- Assess the project management and finance.

4. Evaluation criteria indicators

- At least two different agroforestry management systems to cope with demands of different stakeholders are developed;
- The demonstration sites can well disseminate the new agroforestry

technologies;

- Project design is able to fulfill the project objectives.
- The developed criteria and indicators are applicable for evaluating the sustainability of such agroforestry management systems;
- The awareness of agroforestry system on project stakeholders is improved;
- Outcomes and recommendations generated from this project are provided to relevant governmental policy-making agency;
- The important project outputs will be continued after the completion of this project;
- The successful agroforestry systems can be replicated to similar regions.
- Project progress reports and completion report are completed.
- Project audit report is provided and expenses are reasonable.

5. Evaluation methods

- Desk study;
- Field visits to project site for direct observation;
- Interviews with project stakeholders.

6. Tentative schedule

October 5 – 19, 2013 (Two working days)

(1) Desk study: Review Project Proposal, Overall Work Plan, Annual Work Plans in Project Year 1 and 2, Quarterly Progress Reports, Midterm Progress Report, Completion Report and Technical Report etc..

(2) Desk work: Development of TE Plan in team work; Search information and data for the evaluation.

November 17 – 23, 2013 (Six working days)

(3) Field visits to project sites in Chinese Taipei; Interviews with project stakeholders.

Date	Event	Stay
17-Nov	Arrival of TE delegation	Taipei
18-Nov	Morning: Meeting & project documents review Afternoon: Field trip-Pinglin study site	Taipei
19-Nov	Morning: Travel from Taipei-Alishan (4.5 hr) Afternoon: Field trip-Alishan agroforestry	Alishan
20-Nov	Morning: Travel from Alishan-Yuchi (3 hr) Afternoon: Field trip-Yuchi study site	Lienhuachih
21-Nov	Morning: Field trip-Wushow study site Afternoon: Travel from Wushow-Taipei (3.5 hr)	Taipei
22-Nov	Summary meeting	Taipei
23-Nov	Departure of TE delegation	

*TE team needs to summarize the work each day and plan the work/itinerary for the next day during their stay in project site.

November 24 – 30, 2013 (Two working days)

(4) Desk study: Review and analyze related materials acquired from field visits and interviews.

(5) Desk work: Development and documentation of TE Report in team work.

The estimated working days are 12 working days and the calculation of the working days for each TE member may be different upon the actual workload and responsibility.

Annex A

List of stakeholders to be interviewed:

1. Landowner/farmer of Pinglin study site
2. Landowner/farmer of Yuchi study site
3. Landowner/farmer of Kalala study site
4. Representative from participating industry

Annex 4 Project Logical Framework

PROGRAM ELEMENTS	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Development Objective: To develop and demonstrate the sustainable agroforestry systems adaptable in upland areas	. At least 2 agroforestry systems for uplands will be provided. . At least 2 demonstration sites will be established for inspection.	Research papers/notes and proceedings of seminar or symposium will be available.	
Specific Objective: 1. To develop different agroforestry management systems to cope with different demands of crop planting and afforestation. 2. To demonstrate the ability of these systems in preventing the destructive landslides and massive surface erosions on cultivated uplands. 3. To develop the criteria and indicators for evaluating the sustainability of such agroforestry management systems. 4. To encourage the communities of mountain villages to participate in the	1. At least 2 agroforestry systems can be adapted in upland areas. 2. A set of criteria and indicators for evaluating the sustainability will be ready for application. 3. At least 3 upland villages will participate in this research project.	1. Several agroforestry pilot studies have been carried out in 1980s. However, the trial plots were abandoned for years. This project will try to find out the succession of these pilot plots and gather the existed information. 2. New experimental plots will be set up within 3 study sites. 3. Soil erosion/accumulation of different agroforestry systems will be monitored. 4. The interaction between growth of tree/crops and soil conservation	The risky extreme weather events such as typhoon impacts could ruin the experimental plots and postpone the completion of the project. The recovery expenses will be borne by TFRI.

PROGRAM ELEMENTS	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
development of new agroforestry system and take part in the dissemination of new technologies.		will be evaluated.	
Outputs 1: at least 2 agroforestry management systems, the criteria and indicators for evaluating the sustainability of such agroforestry management systems will be developed by TFRI.	The new developed system and the criteria and indicator will be introduced in published research papers.	First hand on-the-ground data collection/analyses and economic analysis models will supply the necessary information for this project.	
Outputs 2: to set up 3 demonstration areas for verifying the ability of soil and water conservation of these agroforestry systems, will be carried out by TFRI, TFB and CFA.	Three soil and water conservation demonstration areas of these agroforestry systems will be set up	The demonstration sites will also be introduced in published papers and can be inspected by the public as well as foreign researchers.	The willingness of cooperation by TFB, CFA and village farmers must be assured.
Outputs 3: to foster 3 technical teams to be organized by farmers of village communities in uplands for technology dissemination, will be carried out by TFRI and CFA.	The farmers' technical teams will serve as assistants of the researchers in this project. At least 3 teams will be fostered by 2012.	A list of trained farmers' technical teams will be available to the public, including on TFRI website.	Village farmers will follow the agreement and serve after training completing.

Annex 5 Training/Meeting/Symposium Activity List

Date	Location	Topic	Participator	Amount of participator
2011.9.26	TFRI	Inception workshop	Researcher, farmer, industry, APFNet delegation	75
2012.3.13	TFRI	Agroforestry and suitable fruit trees research meeting	Researcher, farmer, governmental department	50
2012.10.25	TFRI	Mid-term workshop	Researcher, farmer, Industry, APFNet delegation	70
2012.12.30	Kalala	Agroforestry technology dissemination workshop	Farmer	25
2013.1.19-20	Kalala	Agroforestry technology dissemination workshop	Farmer, student	55
2013.1.23	Yuchi	Agroforestry technology dissemination workshop	Farmer	20
2013.5.30	Yuchi	Agroforestry technology dissemination workshop	Farmer	20
2013.7.16	Nantou	International symposium on agroforestry	Researcher, farmer, student	90

Annex 6 Results of Interviewing Stakeholders

1. Landowner/farmer of Pinglin study site

   - *Ching-Shong Pai – Landowner / 2013.11.18*

   The landowner has been planted tea for 4 generations. Considering most tea trees are getting old in their tea garden, they are willing to attempt developing other products, i.e. *Cinnamomum kanehirae* timber. The study site occupies just a small part of their tea garden. If this agroforestry system is practical after a few more years, they will extend it to other part of their tea garden.

   The guarantee the purchase of *Cinnamomum kanehirae* timber contract, signed with the company, did encourage the landowner to participate this agroforestry project.

2. Landowner/farmer of Yuchi study site

   - *Chung-Fon Chen – Landowner / 2013.11.20*

   The landowner, who was inexperienced in planting trees, has been learning about taking care of planted trees through this project. As those interplanted tree growing bigger, he gets more confidence on agroforestry.

   The duration of two years of this project is insufficient. To help the landowner, follow-up project offering technology support would be important at this study site.

3. Landowner/farmer of Kalala study site

   - *Chen-Hon Huang – Secretary of Kalala aboriginal community association / 2013.11.18*

   Coffee is one of the major agricultural products in Kalala. Among 20 ha of the coffee farms in Kalala, about 4 ha is contract farming with Kalala aboriginal community association. Since coffee is a shade-tolerant plant, coffee farms are suitable to develop agroforestry system.

   Kalala village valued this experiment and project experience very much. Villagers discussed about this case several times in their regular village meetings. The community association took this good chance to remind all villagers that the farmers also have to take their own responsibilities, such as weeding and tending, when cooperating with a research project like in this case.

The project team spent a lot of time on communicating with the farmer and community association to ensure the study meets every shareholder's interest.

4. Representative from participating industry

   - *Su-Cheng Huang – Chairman of Yiengu Environment Engineering Company / 2013.11.18*

   This company assisted the project team to find two study sites, Pinglin and Yuchi, since they are interested in *Cinnamomum kanehirae* which is used to grow a valuable medicinal fungus. The company signed contract with the landowners to guarantee the purchase of *Cinnamomum kanehirae* timber after 10 years. With technical support and timber purchase guarantee, the farmers have high motivation and are willing to maintain the study sites. The cooperation among the project team, farmers, and the industries is a successful example when promoting agroforestry system in Chinese Taipei.

   After they had a successful experience on the establishment of the two agroforestry study sites in this project, the company continues to work together with many other farmers on planting trees under agroforestry systems.