

EX-POST EVALUATION REPORT

ITTO Project PD 100/01 Rev.3 (I)

**Capacity Building for the Development of a
Sustainable Rattan Sector in China based on Plantation Sources
(China)**

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Part 1 EXECUTIVE SUMMARY

Introduction

The ITTO Committee on Economic and Market Intelligence and Committee on Forest Industry (CEM-CFI), during their Forty-fourth Session in December 2010 decided that an ex-post evaluation of ITTO Project PD 100/01 Rev. 3(I) be carried out to establish how well the Project served its purpose and to draw recommendations for future action.

The ex-post evaluation was conducted on 20-28 September 2011, about 15 months after project closure or 29 months after project completion. The evaluation aimed to provide an in-depth diagnosis of the Project in order to point out the successful and unsuccessful outcomes, the reasons for successes and failures, and the contribution of ITTO Project PD 100/01 Rev. 3(I) toward the achievement of ITTO's Objective 2000; and draw lessons that can be used to improve similar projects in the future.

The Project

ITTO PD 100/01 Rev.3 (I) "Capacity building for the development of a sustainable rattan sector in China based on plantation sources" was approved during the 33rd Session of the International Tropical Timber Council held on 4-9 November 2002 in Yokohama, Japan.

The project was implemented by the International Centre for Bamboo and Rattan based in Beijing, China starting June 2003. It was conceived to address the general lack of knowledge on cultivation and management of rattan plantations, of forestry workers and farmers in tropical China. The project specifically aimed to demonstrate sustainable management techniques for rattan plantations in three different ecological zones, and providing guidance and training on rattan plantation management for farmers and forestry workers.

The project was planned for 36 months duration and a total budget of USD 983,582.00, of which USD 504,369.00 was from ITTO and the rest contributed by the Government of China. The project was implemented for 85 months with a total budget of USD 1,164,458.70, with two approved extensions at no added cost to ITTO, and the Government of China increasing its contribution to USD 660,089.70.

The target outputs were (1) three demonstration plots for the development and dissemination of sustainable plantation and management techniques in three different ecological zones; (2) three technical manuals on rattan cultivation, management and harvesting, and rattan cane processing; (3) three national training courses on rattan tissue culture and nursery technologies, silviculture, plantation management and cane/shoot harvesting and processing, and products development and marketing; and (4) a regional course/seminar on rattan cultivation, management, utilization and marketing in Asia.

Findings

Despite the lack of a multi-stakeholder consultation conducted purposely for this project, the identified problem was valid as it was drawn from recent investigations in areas in southern China where rattan plantations were distributed, and from in depth reviews on the development and extent of application of technologies on cultivation and plantation management.

The project had successfully demonstrated rattan plantation management practices through over 32 hectares of rattan demonstration plots in southern China (Output 1). In the course of the

project, more plots were established than planned, with funds provided by the Guangzhou Municipal Forestry Administration. The project produced a technical manual in the local language mainly for training purposes, and this was later on translated to English. This manual is an integration of the three proposed manuals on rattan cultivation, management and harvesting, and rattan cane processing (Output 2). The project held three local training courses on rattan cultivation, management, utilization and marketing. A total of 109 forestry workers and farmers attended the training courses (Output 3). The project also hosted a five-day workshop held in Beijing on 23-27 July 2006, in collaboration with the International Network of Bamboo and Rattan (INBAR) (Output 4). The workshop had excellent attendance with 48 participants representing 10 countries in Asia, Latin America and Africa.

At 29 months after project completion, the state owned forest farms continued to engage their forestry workers and farmers from nearby villages in managing rattan plantations and harvesting rattan shoots. Collective farmers who were interviewed showed enthusiasm for rattan plantations and tended to give feedback more on the benefits derived from edible rattan plantations than those for cane production. This is obviously because they have harvested rattan shoots quite regularly starting around 9 months after the establishment of plantations, whereas it will take at least 3-5 years more before mature canes can be harvested.

The sustainability of the project effects is evident from the continuing tangible support from both government and private entities as follows:

- Financial support in the amount of CNY 250,000 (USD 39,195) until December 2012, from the Guangzhou Municipal Forestry Administration, for the expansion of *Calamus viminalis* plantations for edible shoots production in Guangdong, and vegetative propagation of *C. viminalis*; and
- Financial support amounting to CNY 250,000 (USD 39,195) from the Hainan Hongqi Rattan Industry Co., Ltd for the conduct of research to develop techniques for the extraction and separation of antioxidant substances in rattans, with a commitment of support until new products are developed.

The on-going formulation of a draft standard for edible rattan cultivation and storage and preservation of rattan shoots is an important project spin-off that can significantly strengthen the longer-term sustainability of the project effects and deliver the desired impact. Financial support amounting to CNY 50,000 (USD 7,839) for the formulation of these standards until May 2012, has been given by the Guangdong Provincial Forestry Department.

An examination of the progress reports revealed that the delays in completing project outputs were due partly to reasons beyond the control of the Executing Agency. The SARS outbreak and bird flu epidemic in China and other Asian countries in 2003-2004 contributed to the delay in project staff study tours and training workshops for farmers and forestry workers. Due to the untimely demise of a project consultant while on duty travel to Hainan Province and the difficulties of identifying a suitable replacement, the training needs assessment and the subsequent preparation of the technical manual were delayed, pushing the dates of the training courses further.

As this project took about three years before approval and funding, two demonstration sites that were identified when the project was planned were no longer available. Aside from additional time to establish more demonstration sites, the durations of some activities such as production of seedlings for the demonstration plots were also under estimated in the project document.

While all key outputs had been substantially completed in 66 months, the project closure was pushed further for another 19 months until the Executing Agency complied with ITTO management requirements.

Lessons learned

- The value of consensus building during multi-stakeholder consultations is that the process imparts a sense of loyalty to the project, and ownership of the project outputs – ingredients that can result in positive outcomes.
- The conduct of multi-stakeholder consultations and analysis, assessments of project demonstration sites based on suitable criteria, and training needs assessment provide sufficient scope for a pre-project for projects of this nature.
- If commitments from stakeholders are identified during the stakeholder consultation, instead of during the project implementation, such commitments can be factored into the project design and strategy earlier on, resulting in a more efficient and economical implementation.
- Weaknesses in the project design as planned can be addressed in a timely and efficient manner during implementation by constantly revisiting the logical framework matrix (LFM) in order to assess the links between objectives, outputs and activities, and the higher order objective of the project;
- The involvement of decision makers of collaborating organizations is critical to the successful completion of project outputs.
- Collaboration and information exchange among country project teams implementing related ITTO projects contribute significantly to the delivery of successful project outcomes. The role of the ITTO Projects Manager is critical in creating productive linkages among project teams.
- It is equally important, if not even more critical, to hold technical and steering committee meetings during the project extension period.
- Awareness of ITTO project management requirements at project completion avoids the unnecessary lull until project closure.

Conclusions

The project PD 100/01 Rev. 3(I) completed all outputs beyond targets, and satisfactorily achieved the specific objective. The delays encountered by the project were due partly to reasons beyond the Executing Agency's control such as the SARS outbreak, and the untimely demise of a Project Consultant. Demonstration sites that were identified during project planning were no longer available after three years of waiting for project approval.

At 15 months after project closure, the sustainability of project outcomes and effects were evident from the continuing tangible support of former project collaborators for the establishment of rattan plantations, and the interest of the private sector to fund spin-off research activities, especially on the development of products from bio-active components of edible rattan. Households of forestry workers are willing to get involved in managing the rattan plantations in state-owned forest farms, for as long they benefit from the proceeds of the harvests.

The on-going formulation of a standard on edible rattan plantation management and preservation of rattan shoots, and other regulatory tools can facilitate the long-term effects of this project's interventions, and the wider and faster paced realization of its development objective.

It is hoped that the continuing collaboration of the ICBR and INBAR and other international organizations such as FAO and WWF, could lead to a global strategy for a sustainable rattan sector as part of an integrated approach to sustainable forest management.

Recommendations

for the Executing Agency

- In order to generate support for the inclusion of the rattan sector in China's 12th Five Year Plan, conduct timely multi-stakeholder stakeholder consultations and analyses, and prepare a strategic plan for the rattan production and utilization industry in China;
- As a follow through to the successful outcomes of this project, support the formulation of a standard on edible rattan plantation management and other similar initiatives, however, this should involve all rattan-growing provinces in China, including Yunnan;
- Pursue the improvement of the technical manual that was prepared by the project, considering user feedbacks including those gathered during this ex-post evaluation;
- Enhance the capacity of researchers and research managers to prepare well-designed project proposals using the objectives-oriented framework approach;
- Encourage research staff to participate in the ITTO Freezailah Fellowship Programme for funding of short-term activities such as participation in international conferences, training courses and study tours, preparation of manuals and monographs, and small grants for post-graduate study.

for ITTO

- As part of the Project Completion Reports, it is worthwhile to require inclusion of the LFM that has evolved during implementation. This will be a more useful tool for ex-post evaluations aside from the LFM derived during planning stage. In most cases, changes in project elements are inevitable and if these are not reflected in the final LFM, evaluation can result in an inappropriate diagnosis of project performance. Lessons drawn from LFMs that have undergone changes would be useful for designing future projects of a similar nature.
- Continue to support projects on non-wood forest products such as rattan, whilst encouraging a more robust collaboration and information exchange among rattan-producing ITTO member countries.
- Ensure that technical and steering meetings are held during project extension periods;
- Reiterate ITTO project management requirements at project completion to facilitate project closure.

Part 2 MAIN TEXT

1 Introduction

1.1 Background and Rationale of the Evaluation

The ITTO Committee on Economic and Market Intelligence and Committee on Forest Industry (CEM-CFI), during their Forty-fourth Session in December 2010 decided that an ex-post evaluation of ITTO Project PD 100/01 Rev. 3(I) be carried out to establish how well the Project served its purpose and to draw recommendations for future action.

This ex-post evaluation aims to provide an in-depth diagnosis of the Project in order to point out the successful and unsuccessful outcomes, the reasons for successes and failures, and the contribution of ITTO Project PD 100/01 Rev. 3(I) toward the achievement of ITTO's Objective 2000; and draw lessons that can be used to improve similar projects in the future.

1.2 Project Identification

Serial number: PD 100/01 Rev. 3 (I)

Title: Capacity building for the development of a sustainable rattan sector in China based on plantation resources

Host Government: China

Executing Agency: The International Centre for Bamboo and Rattan (ICBR)¹

1.3 Project Context

The project aims to support capacity building for the sustainable development of the rattan sector in China by demonstrating sustainable management techniques for rattan plantations in three different ecological zones, and providing guidance and training on rattan plantation management for local farmers and foresters in communities in southern China.

The project's objective is aligned with the Objectives c and f of ITTA 1994, the ITTO Action Plan 1998-2001 (Libreville Action Plan) and ITTO Action Plan 2002-2006 (Yokohama Action Plan) as outlined below:

ITTA 1994

Objective (c) - To contribute to the process of sustainable development; and

Objective (f) - To promote and support research and development with a view to improving forest management and efficiency of wood utilization as well as increasing the capacity to conserve and enhance other forest values in timber producing tropical forests;

Libreville Action Plan

Reforestation and Management

Goal 3: Enhance technical, financial and human capacities to manage the topical timber resource base

¹ Formerly called the China International Centre for Bamboo and Rattan (CINCEBAR) until 2003. ICBR, founded in July of 2000, is a non-profitable scientific research institution under the State Forestry Administration.

Action 1: Promote access to, and transfer of, technologies and encourage technical cooperation for sustainable forest management; forest restoration and reforestation;

Action 3: Design and conduct regional training events to enhance technical and human capabilities to manage the resource base.

The Yokohama Action Plan

Reforestation and Management

Goal 1: Support activities to secure the tropical timber resource base

Action 5: Assess opportunities for, and promote development of, non-timber forest products and forest services that can improve the economic attractiveness of maintaining the forest resource base.

Goal 2: Promote sustainable management of tropical forest resources

Action 5: Encourage members and assist them, where appropriate, to Improve the productive capacity of natural forests, where appropriate, through intensified silvicultural practices, better utilization of lesser-used species, the promotion of non-timber forest products, guided natural regeneration, enrichment planting and reforestation.

The project's objective is relevant to the objectives of ITTA 2006 and ITTO's Action Plan 2008-2011, outlined as follows:

ITTA 2006

Objective (q) - Promoting better understanding of the contribution of non-timber forest products and environmental services to the sustainable management of tropical forests with the aim of enhancing the capacity of members to develop strategies to strengthen such contributions in the context of sustainable forest management, and cooperating with relevant institutions and processes to this end.

ITTO Action Plan 2008-2011

Actions F and f2 under Expected Outcome 6: Tropical forest resource sustainably managed, i.e.,

Action by ITTO

F - Provide guidance on improving the sustainable yield of timber and non-timber products and services by intensifying the silvicultural management of natural tropical production forests and by restoring degraded forests

Action by Member

f2 - Promote and support research into forest dynamics (growth and yield studies) in different forest types and under various management schemes

2 Evaluation Scope, Focus and Approach

2.1 Scope and Focus

The primary purpose of this ex-post evaluation is to provide an in-depth diagnosis of the Project, identifying its successful and unsuccessful outcomes, the reasons for its successes and failures, and the contribution of the project towards the achievement of ITTO's Objective 2000², and to draw lessons that can be used to improve similar projects in the future.

² In 1990, ITTO members agreed to strive for an international trade of tropical timber from sustainably managed forests by the end of the century. This commitment became known as the ITTO's Objective 2000.

The specific Terms of Reference for the evaluation are as follows:

- i. Assess the project's design and contribution to the achievement of the project objectives.
- ii. Assess the achievement of the project's outputs and specific objectives.
- iii. Evaluate the impact and relevance of the project, detailing its impact on development and specific objectives as stated in the project documents.
- iv. Determine the effectiveness of technology transfer to target groups if applicable.
- v. Assess the overall post-project situation for the projects, including the conditions of their intended direct or indirect beneficiaries.
- vi. Define and assess unexpected effects and impacts, either harmful or beneficial, and present the reasons for their occurrences.
- vii. Analyze and assess implementation efficiency, including the technical, financial and managerial aspects.
- viii. Assess the overall sustainability of the projects after completion, and include appropriate recommendations to safeguard the continuing of their positive impacts, and enhance utilization of the technologies (if applicable) and other results developed by the projects.
- ix. Taking into account the results of the evaluation, make an overall assessment of the projects' relative success or failure, to summarize the key lessons learnt; and identify any issues or problems that should be taken into account in designing and implementing similar projects in future.
- x. Assess the overall cost of the projects with original budget provisions, and their respective linkage with the overall results.
- xi. Prepare the evaluation report in accordance with the references for the Project Evaluation Report, as contained in the ITTO Manual for Project Monitoring, Review and Evaluation, third edition and the ITTO Manual on Standard Operating Procedures 2009.
- xii. Assess the project's contribution to the relevant ITTA objectives (1994 and 2006) and the relevant ITTO Action Plan.
- xiii. To prepare one or more articles for each project, for possible publication in the ITTO Tropical Forest Update (TFU), in consultation with the editor, containing an overview of the projects and summarizing the lessons learned from the evaluation work. Appropriate photographs should be provided.

2.2 Approach of Evaluation

This ex post evaluation was carried out approximately 15 months after project closure, or 29 months after substantial completion of project outputs, and submission of the Completion and Final Technical Reports.

The evaluation involved

- a review of the Project Document, Yearly Plans of Operation (YPO), Minutes of the Project Steering Committee Meetings, Bi-Annual Progress Reports, Project Final Technical Report (includes technical papers, study tour and other activity reports, and the Technical Manual), Project Completion Report, Audited Financial Reports, and Requests for Extension.
- an opening meeting with key project staff to discuss how the problem was identified and the method used to develop the project design, its objectives, outputs, intended outcomes, and target beneficiaries; review of the project's accomplishments and financial reports;

- discussions with the project implementation team and participating officials from the International Centre of Bamboo and Rattan (ICBR), the International Network of Bamboo and Rattan (INBAR), the Research Institute of Tropical Forestry (RITF), the Experimental Centre of Tropical Forestry (ECTF), and Provincial/Municipal/ County Forestry Administration staff;
- field visits to the demonstration plots, namely, the Jiuwantan Forest Farm and the Shadui Collective³ Forest Farm in Guangdong province; and the Du'an Forest Farm, the Qingshang Seed Orchard, and the Yingyang Forest Farm in the Guangxi province; and
- Closing meeting with Director General, Deputy Director General of the International Centre for Bamboo and Rattan, a former Project Consultant and other project staff to discuss the findings of the evaluation, conclusions and recommendations, and lessons learned.

Appendix B is a list of project staff and stakeholders who participated in the discussions. Discussions were guided by questions formulated specifically for project staff, national experts, consultants and project beneficiaries, based on the checklist provided in the ITTO Manual for Project Monitoring, Review and Evaluation (Third Edition, 2009).

The itinerary of travel for this evaluation is shown in Appendix A. The Consultant deemed it necessary to visit three more forest farms (highlighted sections) than was originally planned, and also visit a bamboo and rattan village weaving center in Du'an County. Although this weaving center was not part of the project, the intention was to gather information on the supply of rattan for the production of export-quality wares and handicrafts and the countries where their products were being exported.

3 Project Facts

3.1 Background and Origin

China is experiencing a shortage of good quality rattan canes for its rattan processing and manufacturing industries. Their annual demand for rattan canes is 40,000-50,000 tons whereas local yield is only about 10,000 tons. China, being the world's largest importer of rattan canes, needs to develop its own rattan plantations on a large scale so that it can sustain the competitiveness of its rattan industry.

A preliminary study estimated that about two million hectares of tropical forest plantations and secondary forests are suitable for inter-planting rattans, however local forestry workers and farmers lack the knowledge and skills to establish and manage rattan plantations. While rattan nursery techniques, germplasm collection, tissue culture, and plantation management have been well studied in China for the last 30 years, the results have not been applied, as there have been problems in integrating these in production practices.

3.2 Development Objective

This project was conceived to support capacity building for sustainable rattan development in China in order to increase the social and economic contributions of the rattan sector to the country.

³ Collective farming refers to agricultural production in which the holdings of several farmers are run as a joint enterprise. In China, land ownership is separate from land use rights, and land is either state-owned or collectively owned.

3.3 Problem Addressed

Forestry workers and farmers in tropical China generally lack knowledge on cultivation and management of rattan plantations.

3.4 Objectives and Outputs

The specific objective of the project is to demonstrate sustainable management techniques for rattan plantation in three ecological zones and provide guidance and training on rattan plantation management to farmers and foresters in local communities in southern China.

The target outputs are:

- Three demonstration plots for the development and dissemination of sustainable plantation and management techniques in three different ecological zones; the project sites identified were the Nanhua State-Owned Forest (NHSF) in Guangdong, Nonggang Nature Reserve (NGNR) in Guangxi; Yingyang Forest Farm at the Experimental Centre for Tropical Forestry (ECTF);
- Three technical manuals on (i) rattan cultivation, (ii) management and harvesting and (iii) rattan cane processing;
- Three national training courses on (i) rattan tissue culture and nursery technologies, (ii) silviculture, plantation management and cane/shoot harvesting and processing, and (iii) products development and marketing;
- A regional course/seminar on rattan cultivation, management, utilization and marketing in Asia.

3.5 Starting Date and Duration

Based on ITTO records, the project commenced on 10 June 2003 (upon ITTO approval of agreement) and was planned for 36 months, but was officially completed in 85 months, with two approved extensions. Progress reports, however, indicate that the project commenced on 1 August 2003, with all outputs substantially completed within 69 months, i.e., at the submission of the Project Completion Report to ITTO on 20 April 2009.

3.6 Budget

	<u>Approved, USD</u>	<u>Actual, USD</u>
ITTO	504,369.00	504,369.00
Government of China	478,213.00	660,089.70
Total	983,582.00	1,164,458.70

4 Findings and Lessons Learned

4.1 Findings

4.1.1 Achievement of the Project

(i) Realized versus Planned Outputs, and Achievement of Objective

Following is a comparison of target and realized outputs. The extension of 49 months was noted and the reasons are discussed.

Output 1: *Three demonstration plots on sustainable plantation and management techniques in three different ecological zones.*

Table 1 shows that Output 1 was satisfactorily completed, with target numbers mostly exceeded. When the project was approved, two identified demonstration sites during the planning stage had become unexpectedly unavailable for the purposes of the project. The land use of one site (NHSF) had changed by the time the project was approved as it took three years from project conceptualization to approval. In another site (NGNR), its management was no longer receptive to establishing a rattan plantation. Hence, the project team had to look for suitable alternative sites, necessitating adjustments in implementation. A Project Technical Committee (PTC) was put in place to address technical issues and all major adjustments were subjected to the approval of the Project Steering Committee (PSC). Collaborators agreed to establish and provide staff for satellite management offices at the project sites.

Table 1 Target and actual achievements for Output 1

Target	Actual
Plot 1: Nanhua State-Owned Forest (NHSF) in Guangdong Purpose: Demonstrate edible rattan plantation at one site with three trials on spacing, fertilization and irrigation	Jiuwantan Forest Farm: Three edible rattan plantations at three sites: one with three trials of spacing, fertilization and irrigation; two with fertilization trial only; Three additional plots for edible rattan, namely: <ul style="list-style-type: none"> - Quinshang Forest Farm: a plantation for rattan cane production was transformed to one for edible shoot production; - Quinshang Forest Farm: a plantation of edible rattan plantation intercropped with a high value tree species; and - Shadui Forest Farm, Xinhui District, Jiangmen City, Guangdong: an edible rattan plantation intercropped with a fruit tree species
Plot 2: Nonggang Nature Reserve (NGNR) in Guangxi Purpose: Demonstrate rattan plantation management in secondary forests at the mountainous limestone areas	Four plantations established in secondary forests at three sites: <ul style="list-style-type: none"> - Mingtang Village, Daxing Township, Du’an County, Guangxi (mountainous limestone area); - Fuqin Village, Pozao Township, Pingguo County, Guangxi (south subtropical region); - Nanmeiling Forest Production Base, Hainan (tropical region consisting of two trials, namely on tree canopy adjustment and additional fertilization); - Jiuwantan Forest Farm, Huadu District of Guangzhou, Guangdong Province (south subtropical region) – 2 ha of plantation representing family tests of two rattan species.
Plot 3: Yingyang Forest Farm at ECTF Purpose: Demonstrate sustainable harvesting of a rattan plantation	Existing 3 year-old rattan plantation at Yingyang Forest Farm at ECTF

In the course of the project, the Guangzhou Municipal Forestry Administration (GZMFA) became quite receptive of the project interventions, and provided additional funds for establishing more edible rattan demonstration sites, and for research on bioactive components from rattan shoots. The project financial reports appropriately accounted for the grant from the GZMFA.

With the approval of the PSC, part of GZMFA grant was also made available to partly fund three masters, one doctoral, and two post-doctoral studies focused on edible rattan plantation management and techniques for extraction, separation, and characterization of bioactive components in rattan shoots. This deviation was the project’s means of overcoming difficulties due to project staff turnover and unexpected redeployment.

In addition to their financial support, the GZMFA also constructed a reinforced concrete access road and a field office, costing approximately CNY 150,000 (USD 18,750), in the vicinity of the project’s demonstration site in the Jiuwantan Forest Farm.

Study tours and participation in international rattan workshops were designed to provide inputs to Output 1. Table 2 shows that the targets were exceeded in terms of number of staff participating in the study tours and the workshop. Study tours enabled project staff to observe proven rattan plantation management techniques used in Malaysia, Indonesia and Thailand.

Due to the outbreak of the Severe Acute Respiratory Syndrome (SARS) and bird flu in China, project staff were not able to participate in the conference organized by the project ITTO PPD 51/02 Rev.1 [I] Application of production and utilization technologies for sustainable development of rattan in the ASEAN member countries held in January 2004. Instead, ten project staff participated in the Global Rattan Workshop organized by the INBAR and FAO, held in on 8-11 January 2008.

The cost of an additional staff participating in the study tour was borne by the Executing Agency. The project’s participation in the Global Rattan Workshop held in Hainan, China instead of the overseas conference enabled more project staff to be involved.

Table 2 Planned and actual study tours and participation in an internal conference to achieve Output 1

Proposed	Actual
Study tours to Malaysia, Indonesia and Thailand for 9 project staff for 12 days	Study tours made by a total of 10 project staff covering 23 days
Participation of two project staff members in the IITO rattan conference for ASEAN member countries in Jan 2004, hosted by the Philippines ⁴	Participation of 10 project staff in the Global Rattan Workshop held in Hainan, China on 8-11 January 2008, organized by INBAR and FAO.

Output 2: *Three technical manuals on (i) rattan cultivation, (ii) management and harvesting, and (iii) rattan cane processing*

For practical reasons, the three manuals were integrated into one manual for training purposes, following the recommendations of the project technical committee (PTC) and project steering committee (PSC). The preparation of the manual was delayed as the local Consultant whose role was to identify the training needs of farmers and forestry workers, and formulate the corresponding course content for the training courses and technical manual, passed away while on duty travel to Hainan province. The difficulty of identifying a qualified consultant who could

⁴ Organized by the ITTO project PD 334/05 Rev 2 (I) Demonstration and Application of Production and Utilization Technologies for Rattan Sustainable Development in the ASEAN Member Countries

take on this role, and ITTO's subsequent approval, contributed to the delay in preparing the manual, pushing the dates of the training courses further. Eventually, a consultant from the Sabah Forest Research Centre took on the role, and worked closely with a local counterpart from the Chinese Academy of Science and project staff in Hainan and Guangdong. The technical manual was used in the training courses, published in May 2008 and distributed to project collaborators in all project sites.

It was noted that the unnecessary delay in the project's official completion date was partly due to the non-submission of the manual's English version until 2 July 2010, whereas all key outputs, including the Completion Report and Final Technical Report, were substantially complete on 30 April 2009.

Output 3: *Three national training courses on (i) rattan tissue culture and nursery technologies, (ii) silviculture, plantation management and cane/shoot harvesting and processing, and (iii) products development and marketing*

The project held one training course in Guangxi (Du'an County, Pingxiang on 18-23 May 2008) and two in Guangdong (Huadu District, Guangzhou on 29 June- 4 July 2008; in Lechang City 12-15 February 2009). No training course was held in Hainan as planned, however, two participants from Hainan attended the training course held in Huadu. In terms of numbers, the participation was overwhelming with 109 farmers and forestry workers compared to the 45 planned. The topics on tissue culture, and product development and marketing were not covered in the courses upon the recommendation of the PTC as project results on these topics were either deemed not suitable, or did not have sufficient scope for dissemination to farmers and forestry workers.

Output 4: *One regional course/seminar on rattan cultivation, management, utilization and marketing in Asia*

The project held a five-day workshop in Beijing on 23-37 July 2006, which was jointly sponsored by ITTO, ICBR in Asia, Latin America and Africa. Originally, the plan was to hold a 7-day workshop for 15 participants from Asia. The workshop book of abstracts and proceedings were timely published.

Based on the above findings, it can be said that all four target outputs were delivered successfully to a level beyond what was planned, and that the project satisfactorily achieved its specific objective.

(ii) Impacts and Effects

The current conditions of the rattan plantations established by the project were verified. Farmers and forestry workers who continued to engage in rattan plantation and shoot harvesting activities after project completion were interviewed. The summary of observations and information gathered is found in Appendix 3.

After over five years of establishing the plantations and more than one year after project closure, the demonstration plots remain well managed. Interviews with farmers and forestry workers who attended training courses conducted in 2008 showed that the project had enhanced their awareness on rattan plantations. Farmers tended to give feedback more on the benefits derived from edible rattan plantations than those for cane production obviously because they have harvested rattan shoots quite regularly starting around 9 months after the establishment of plantations, whereas it will take at least 3-5 years more before mature canes can be harvested. Suggestions from the head of a farmers group and an ECTF plantation manager to make the manual more farmer-friendly, demonstrate their continued interest in the use of the manual for

training purposes. Households of forestry workers are given their share of the proceeds from the rattan harvests, hence their willingness to maintain the plantations.

The active involvement of decision makers in collaborating entities significantly contributed to the positive effects of the project intervention. The objective of this project could not have been achieved without the collaboration of the state-owned forest farms that engaged farmers who did not own sufficient land for plantations of a suitable scale.

Since 2008, forest tenure reform has encouraged the privatization of former collective forests in China, with more than 100 million hectares affected (<http://www.nature.com/news/2011/110921/full/477371a.html>). It is anticipated that the benefits from rattan plantations, specifically for shoot production as demonstrated in this project shall become increasingly attractive to collective farmers and forestry workers. The continuing support of the government for sustainable rattan industry in China is evidenced by the inclusion of rattan industry as a priority sector in China's 11th Five-Year can not be understated.

It was unexpected, though, that an area covering over a hectare of edible rattan shoot production was converted into a residential area for collective farmers under the National Development and Reform Commission (NRDC) program⁵.

(iii) Sustainability

Collective farmers and forestry workers engaged in state forest farm activities, after more than five years of establishing the plantations, continued to show enthusiasm for edible rattan plantations as they are given access to land, and provided institutional and technical support by state owned forest farms. The sustainability of the project effects is demonstrated by the continuing tangible support from both government and private entities as follows:

- a) Financial support amounting to CNY 250,000 (USD 39,195) until December 2012 from the Guangzhou Municipal Forestry Administration, for the expansion of *Calamus viminalis* plantations for edible shoots production in Guangdong, and vegetative propagation of *C. viminalis*;
- b) Financial support amounting to CNY 250,000 (USD 39,195) from the Hainan Hongqi Rattan Industry Co., Ltd. to conduct studies on developing techniques for extraction and separation of antioxidant substances of rattans, with a commitment for continued support until products are developed.

An important project spin-off that can significantly strengthen the sustainability of the project effects and deliver the desired impact in Guangdong is the on-going formulation of a draft standard for edible rattan cultivation and storage and preservation of rattan shoots. Financial support amounting to CNY 50,000 (USD 7,839) for the completion of these standards until May 2012, has been given by the Guangdong Provincial Forestry Department.

Although not part of the original plan, the project had supported Masters and Ph.D. students, as well as postdoctoral fellows for the conduct of research on the characterization of bioactive components of edible rattan. In the longer term, these former project staff who have achieved higher academic degrees through research on rattan, will most likely build up their profession

⁵ The National Development and Reform Commission (NDRC), formerly State Planning Commission and State Development Planning Commission, is a macroeconomic management agency under the Chinese State Council, which has broad administrative and planning control over the Chinese economy (http://en.wikipedia.org/wiki/National_Development_and_Reform_Commission, 25/09/2011)

along this direction, given adequate institutional support. Following is a list papers that they have prepared for publication after this project's completion.

- Separation and identification of the antioxidant substances of fresh shoots of *D. margaritae*
by Huang Xuemei¹, Niu Guocai¹, Zhao Xia², Zhang Zhaoqi¹, Huang Shineng²
(1. College of horticulture, South China University of Agriculture; 2. Research Institute of Tropical Forestry, Chinese Academy of Forestry)
- Effect of boiled and dried treatments on antioxidant activities of the *D. margaritae* shoots
by Niu Guocai¹, Huang Xuemei¹, Zhao Xia², Zhang Zhaoqi¹, Huang Shineng²
(1. College of Horticulture, South China University of Agriculture; 2. Research Institute of Tropical Forestry, Chinese Academy of Forestry.)
- Comparison of antioxidant activities of fresh shoots of *D. margaritae* and four common stem vegetables
by Huang Xuemei¹, Huang Shineng², Niu Guocai¹ and Zhang Zhaoqi¹
(1. College of horticulture, South China University of Agriculture; 2. Research Institute of Tropical Forestry, Chinese Academy of Forestry.)
- Antioxidant activities of *D. margaritae* shoots and other organs
by Huang Xuemei¹, Niu Guocai¹, Zhang Zhaoqi¹ and Huang Shineng²
(1. College of horticulture, South China University of Agriculture; 2. Research Institute of Tropical Forestry, Chinese Academy of Forestry.)
- Grey relational analysis between the browning and related enzyme activities in fresh-cut *D. margaritae* shoots
by Zhang Junjun¹, Huang Xuemei², Huang Shineng¹, Zhao Xia¹
(1. Research Institute of Tropical Forestry, Chinese Academy of Forestry; 2. College of horticulture, South China University of Agriculture.)

4.1.2 Project formulation and implementation

(i) Stakeholder involvement during the identification and during the implementation of the Project

Despite the lack of multi-stakeholder consultation conducted purposely for this project, the problem identified was valid as it was drawn from recent investigations in areas in southern China where rattan plantations were distributed, and from in depth reviews on the development and extent of application of technologies on cultivation and plantation management.

It must be emphasized, however, that the process of consensus building during stakeholder consultations held for a specific project, imparts a sense of loyalty to the project and shared ownership of its intended outcomes. Commitments of stakeholders, such as the additional financial support from GZMFA, if identified during a stakeholder consultation and factored into the project's resource allocation plan, would have resulted in a more efficient implementation.

Upon the recommendation of the ITTO Projects Manager, a Project Technical Committee (PTC) was put in place for the purpose of addressing technical issues arising from the implementation strategy of the project. Hence, weaknesses in the project design that became apparent during implementation were addressed. Prior assessment of the demonstration sites that could have been identified by stakeholders during project planning consultation would have significantly improved implementation.

Considering the revisions in the project's LFM within almost three years before gaining ITTO approval and funding, there was sufficient scope for a pre-project for the conduct of stakeholder

consultations and analysis, an assessment of plantation demonstration sites against a set of selection criteria, and a training needs assessment.

(ii) Appropriateness of the Project design

Although the Logical Framework Matrix in the Project Document was not derived using the logical framework method, the vertical and horizontal logic were appropriate, as the Experts Panel had alluded to several improvements of the LFM during the project's appraisal. One of the benefits of using an objectives-oriented framework in designing projects is in enabling stakeholders participating in the planning process to have a holistic view of the problem at hand, how it links with other industry problems, and where the project interventions are placed in the bigger picture – such as in the overall strategy for China's rattan industry.

It is also worthwhile to mention that the project LFM is a useful tool during implementation, and changes made in the course of implementation should be reflected in the matrix as a means of evaluating the appropriateness of deviations and additional activities. In some cases, changes during implementation are inevitable and if these are not reflected in the final LFM, evaluation can result in an inappropriate diagnosis of the project's performance. The appropriateness of substitute activities, for example, the attendance of project staff to the Global Rattan Workshop organized by the INBAR and FAO, held in China on 8-11 January 2008 *vice* the Regional Rattan Conference in 2004 can be established through an analysis of the vertical and horizontal logic of the project design.

(iii) Efficiency and operational aspects

A total of 4 Project Steering Committee (PSC) meetings were held from 2004 -2007, and one in 2010. Project progress reports were submitted promptly to ITTO. Activities such as study tours and attendance to international conferences were adequately reported to ITTO. Decisions made during the PSCs were faithfully implemented, except the revival of the project website.

All deviations from the original project activities were approved by the PSC. Part of the increased contribution of Government of China were funds provided by the GZMFA to support the establishment of more demonstration sites, and portions of the research conducted by Masters and Ph.D. students, and postdoctoral fellows.

Although the Project Completion Report was submitted on 30 April 2009, the project closure occurred 19 months after, until the publication of the English version of the Technical Manual, and submission of ITTO requirements for the project's financial closure. This underscores the importance of holding timely technical and steering committee meetings during the extension period.

An examination of the progress reports shows that delays in completing project outputs were due partly to reasons beyond the control of the Executing Agency. The SARS and bird flu outbreak in China and other Asian countries, and the untimely demise of a project consultant while on duty travel to Hainan Province, contributed to the delay in study tours and the training courses. Aside from additional time for the establishing additional demonstration sites, the duration of some activities such as production of seedlings for the demonstration sites were also under estimated.

Information exchange and collaboration of the project team with other on-going ITTO rattan projects implemented by Thailand, Malaysia, Indonesia and the Philippines contributed significantly to the achievement of project outputs. The role of the ITTO Projects Manager in

coordinating country teams facilitated the productive networking and information exchange between project teams.

(iv) Effectiveness

The project design was straightforward and reasonably effective in achieving the outputs and outcomes. The problem identified was valid, the choice of collaborators was appropriate, and the identified external factors critical to the success of the project were accurate. These can be largely accorded to the expert knowledge of key project staff and consultants, and their several years of involvement in the rattan sector, aside from improvements to the project design made during the project appraisal. The active participation of the collaborating organizations' decision makers was critical to achieving the outputs and outcomes. The use of demonstration plots in forest farms was effective in generating interests among forestry workers and farmers.

It is perceived that a pre-project for the purpose of holding stakeholders consultation and analysis, assessment of prospective demonstration sites, and a training needs assessment could have resulted in a significantly more effective and economical project implementation.

4.1.3 The Project proposal appraisal process

The project was conceived in 1999 and the proposal formulated using the first edition of the ITTO Manual on Project Formulation. By the time the proposal was first submitted in December 2000, the 2nd edition of the ITTO Manual on Project Formulation was in effect. The project was revised three times, however the revisions did not reflect close adherence to the 2nd edition of the ITTO Manual on Project Formulation. Nevertheless, comments and corrections made by the Experts Panel resulted in the significant improvement of the project's LFM, its budget and the proposal as a whole.

4.2 Lessons learned

- The value of consensus building during multi-stakeholder consultations is that the process imparts a sense of loyalty to the project, and ownership of the project outputs – ingredients that can result in positive outcomes.
- The conduct of multi-stakeholder consultations and analysis, assessments of project demonstration sites based on suitable criteria, and training needs assessment provide sufficient scope for a pre-project for projects of this nature.
- If commitments from stakeholders are identified during the stakeholder consultation, instead of during the project implementation, such commitments can be factored into the project design and strategy earlier on, resulting in a more efficient and economical implementation.
- Weaknesses in the project design as planned can be addressed in a timely and efficient manner during implementation by constantly revisiting the logical framework matrix (LFM) in order to assess the links between objectives, outputs and activities, and the higher order objective of the project;
- The involvement of decision makers of collaborating organizations is critical to the successful completion of project outputs.
- Collaboration and information exchange among country project teams implementing related ITTO projects contribute significantly to the delivery of successful project outcomes. The role of the ITTO Projects Manager is critical in creating productive linkages among project teams.

- It is equally important, if not even more critical, to hold technical and steering committee meetings during the project extension period.
- Awareness of ITTO project management requirements at project completion avoids the unnecessary lull until project closure.

5 Conclusions and Recommendations

5.1 Conclusions

The project PD 100/01 Rev. 3(I) completed all outputs beyond targets, and satisfactorily achieved the specific objective. The delays encountered by the project were due partly to reasons beyond the Executing Agency's control such as the SARS outbreak, and the untimely demise of a Project Consultant. Demonstration sites that were identified during project planning were no longer available after three years of waiting for project approval.

At 15 months after project closure, the sustainability of project outcomes and effects were evident from the continuing tangible support of former project collaborators for the establishment of rattan plantations, and the interest of the private sector to fund spin-off research activities, especially on the development of products from bio-active components of edible rattan. Households of forestry workers are willing to get involved in managing the rattan plantations in state-owned forest farms, for as long they benefit from the proceeds of the harvests.

The on-going formulation of a standard on edible rattan plantation management and preservation of rattan shoots, and other regulatory tools can facilitate the long-term effects of this project's interventions, and the wider and faster paced realization of its development objective.

It is hoped that the continuing collaboration of the ICBR and INBAR and other international organizations such as FAO and WWF, could lead to a global strategy for a sustainable rattan sector as part of an integrated approach to sustainable forest management.

5.2 Recommendations

for the Executing Agency

- In order to generate support for the inclusion of the rattan sector in China's 12th Five Year Plan, conduct timely multi-stakeholder stakeholder consultations and analyses, and prepare a strategic plan for the rattan production and utilization industry in China;
- As a follow through to the successful outcomes of this project, support the formulation of a standard on edible rattan plantation management and other similar initiatives, however, this should involve all rattan-growing provinces in China, including Yunnan;
- Pursue the improvement of the technical manual that was prepared by the project, considering user feedbacks including those gathered during this ex-post evaluation;
- Enhance the capacity of researchers and research managers to prepare well-designed project proposals using the objectives-oriented framework approach;
- Encourage research staff to participate in the ITTO Freezailah Fellowship Programme for funding of short-term activities such as participation in international conferences, training courses and study tours, preparation of manuals and monographs, and small grants for post-graduate study.

for ITTO

- As part of the Project Completion Reports, it is worthwhile to require inclusion of the LFM that has evolved during implementation. This will be a more useful tool for ex-post

evaluations aside from the LFM derived during planning stage. In most cases, changes in project elements are inevitable and if these are not reflected in the final LFM, evaluation can result in an inappropriate diagnosis of project performance. Lessons drawn from LFMs that have undergone changes would be useful for designing future projects of a similar nature.

- Continue to support projects on non-wood forest products such as rattan, whilst encouraging a more robust collaboration and information exchange among rattan-producing ITTO member countries.
- Ensure that technical and steering meetings are held during project extension periods;
- Reiterate ITTO project management requirements at project completion to facilitate project closure.

ANNEX Executing Agency's Views

The International Centre for Bamboo and Rattan (ICBR) is truly grateful to ITTO for funding this project as it has helped China build its capacity in research and development of its rattan sector. ICBR acknowledges the cooperation of the International Network of Bamboo and Rattan (INBAR), and the fruitful information exchange with other rattan producing ITTO member countries.

ICBR is in agreement with the findings and conclusions drawn from this ex post evaluation, and sincerely appreciates the lessons and recommendations.

The positive outcomes of the project and this ex post evaluation will provide strong support to ICBR's efforts in acquiring funding from the national and local governments through China's 12th Five Year Plan, for establishing more rattan plantations, and assisting small and medium manufacturers of rattan furniture and handicrafts, that would benefit more rural people who rely on rattan resources for their livelihood.

Based on the lessons learned from the implementation of the project, the ICBR will improve the draft strategic plan for a sustainable rattan production and utilization industry in China, and pursue its approval from the national government.

Formulation of the provincial standard on edible rattan plantation management, and storage and preservation of rattan shoots is under way. The ICBR fully supports this activity in kind and/or cash where possible. The formulation of standards is very important to the development of the sector, and the ICBR will pursue the integration of the standards in regulatory procedures.

The ICBR supports all efforts to improve the Technical Manual formulated by this project, and will seek funding for its publication in Chinese for wider dissemination to local farmers, and in English information sharing with other rattan producing countries.

ICBR will encourage its research and management staff to look into the application requirements of the Freezailah Fellowship Programme, and then identify priority short-term activities aligned with sustainable forest management for possible funding by this programme.

Appendix A ITTO-Consultant Agreed Work Schedule

11 Aug 2011	Dispatch of the following documents supporting for the evaluation work: <ul style="list-style-type: none">(i) Relevant ITTO Manuals(ii) Project documents(iii) Technical reports(iv) Project Audit Reports and(v) Project completion reports
Sep 2011	Meeting with project's personnel in China for briefing and comprehensive discussions and analysis of project implementation and results, as well as preparing the work programme for field visits. Discussions with relevant stakeholders involved in the projects works in China.
01 Oct 2011	Submission of draft report (executive summary) to ITTO, the Executing Agency and the governments of China for comments and suggestions
14 Oct 2011	Submission of the full final report including executive summary, and power point presentation to ITTO
21 Oct 2011	Submission of article for TFU to ITTO
15-17 Nov 2011	Presentation of the report during the 467 th Session of the ITTO Committees on Forest Industry and Economic Information and Market Intelligence

Appendix B Provisionary & Actual Schedule of Ex Post Evaluation Activities

Monday, Sept. 19, 2011 - Arrivals

Time of the day	Session/Activity	Venue
Sept. 19, 2011	Arrival of the Consultant and staff from Guangzhou, stay overnight at ICBR Meeting with Assistant Project Director and staff to discuss objectives of the evaluation, and expectations form both parties, schedule of field visits and working schedule	Beijing

Tuesday, Sept. 20, 2011 – Ex-post evaluation meeting

The meeting will start at 09:00 in the meeting room on the 5th floor of the International Bamboo and Rattan Tower.

Sept. 20, 2011	<ol style="list-style-type: none"> 1. Meeting at ICBR, presentations by ICBR of the project implementation, outputs, impacts and sustainability, etc. 2. Discussion and arrangement of the field visits and revision of the working schedule 	Beijing
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Wednesday-Sunday, Sept. 21-26, 2011 – Field visits

Sept. 21, 2011 Wednesday	<ol style="list-style-type: none"> 1. Fly CA 1315 from Beijing to Guangzhou (1100-1410) 2. Meeting with project staff, officials and other stakeholders at RITF, stay overnight in Guangzhou Visit to the Jiuwantan Forest Farm Office and meeting with Farm Director, Head of Farmers' Group, Forestry Technicians and RITF Staff 	Beijing, Guangzhou
Sept. 22, 2011 Thursday	<ol style="list-style-type: none"> 1. Visit to the edible rattan plantation on mountainous limestone Shadui Collective Forest Farm in Xinhui County, Guangdong in the morning 2. Back to Guangzhou in the afternoon, stay overnight in Guangzhou 	Xinhui, Guangzhou
Sept. 23, 2011	<ol style="list-style-type: none"> 1. Fly CA 3418 from Guangzhou to Nanning (1005-1120). 	Du'an

Friday	<ol style="list-style-type: none"> 2. Visit Bamboo and Rattan Weaving Centre in Daxing Village, Disu Township, Du'An County in the morning 3. Visit to the rattan plantation in mountainous limestone area in Du'an County of Guangxi, stay overnight in Du'an 	
Sept. 24, 2011	<ol style="list-style-type: none"> 1. Visit to the plantation site in Du'an in the morning; 2. Back to Nanning and head to ECTF in Pingxiang City in the afternoon, stay overnight at ECTF. <p>Travel to ECTF in Pingxiang, Guangxi and meet with ECTF management and staff who were involved in project; stayed overnight in Pingxiang</p>	ECTF
Saturday		
Sept. 25, 2011	<ol style="list-style-type: none"> 1. Visit to the edible rattan plantation, dual purpose management of rattan plantation, sustainably harvested rattan plantation in living collection plot of rattan at ECTF; Qingshang Seed Orchard (rattan intercropped with fragrant rosewood) and Yingyang Forest Farm (20 yrs old rattan plantation used for cane harvesting trials) 2. Meeting with project staff, officials and other stakeholders at ECTF, stay overnight at ECTF Pingxiang. 	ICBR
Sept. 26, 2011	<ol style="list-style-type: none"> 1. Back to Nanning in the morning; 2. Fly CA 1336 from Nanning to Beijing 	ICBR
Sept. 27, 2011	<ol style="list-style-type: none"> 1. Working day for the Consultant to prepare the draft report 	ICBR
Sept. 28, 2011	<ol style="list-style-type: none"> 1. Meeting at ICBR, presentation by the Consultant of the draft ex-post evaluation report for feedback and comments 	ICBR
Sept. 29, 2011	<ol style="list-style-type: none"> 1. Departure of the Consultant 	Beijing

Appendix C List of plantation sites and organizations visited, and persons interviewed during the Ex post Evaluation

Sept. 20, 2011(Tuesday)

ICBR, Beijing

Dr. Huang Shineng, Assistant Project Director
Dr Chen Xuhe, Project Consultant
Mr. Dai Honghai, ICBR staff
Ms. Nouli Gao, ICBR staff
Ms. Xi Li, graduate student

21 Sep 2011 (Wednesday)

Jiuwantan State Forest Farm, Guangzhou, Guangdong Province

Xu Guangti, Farm Director
Tong Zhihong, Farm forestry technician
Xia Jinqi, Head of farmers group

22 Sep 2011 (Thursday)

Xinhui County, Guangdong

Li Rongsheng, RITF, Project National Expert

23 Sep 2011 (Friday)

Bamboo and Rattan Weaving Centre & Rattan

Huang Baolong, participant, project training workshop and apprentice planting

Rattan Plantation in Du'An County

Mo You, Deputy Director, Du'An County Forestry Bureau

24 and 25 Sep 2011 Friday and Saturday

ECTF

Jia Hongyan, Deputy Director
Guo Wenfu, Head of Science Division
Lu Lihua, Deputy Head of Science Division
Li Yunxing, Engineer and Project staff who established the rattan plantation
Feng Changlin, Forestry worker managing the rattan plantation

28 Sep 2011 (Wednesday)

ICBR, Beijing

Prof Jiang Zehui, Project Director and Director General, ICBR
Dr. Fei Benhua, Deputy Dir General, ICBR
Prof Chen Xuhe, Project Consultant
Dr. Huang Shineng, Deputy Project Leader
Ms Li Lan, Project Finance Officer
Ms Liu Xin'e, Rattan Researcher
Mr Dai Honghai, Asst Finance Officer
Dr. Yang Jinchang, former Project Staff
Ms. Gao Nuoli, ICBR staff
Ms. Li Xi, graduate student

Appendix D Table 3 Existing condition of the project demonstration sites as observed during this evaluation and information gathered from former project participants who are still currently engaged in forest farm activities

Details	Current condition	Feedback and other relevant information
Jiuwantan State Forest Farm Edible rattan plantation Rattan for shoot production was interplanted with Eucalypts in 2004;	Farm regularly hires a group of 10 farmers for management of rattan plantation and harvesting of shoots. Rattan plantation is well maintained and is monitored every 10 days by forest farm workers.	Farm Director and 51 farm staff gained knowledge on rattan shoot production from training course, and subsequent management of rattan demonstration plot. Head of farmers group thinks the technical manual is simple but can be more farmer-friendly if illustrations and/or actual photos or sketches are included.
Farmers collective farm at Xinhui County, Shadui, Guangdong Two hectares of edible rattan plantation and cane production intercropped with avocado trees	Plantation is satisfactorily maintained; irrigation system still in place; some rattan show signs of damage due to suspected insect infestation; rattan canes are 2 cm diameter and 3-4 m long; rattan for shoot production are fruiting; edible rattan plants with signs damage caused by mice	Formerly a collective forest farm but ownership of this land has been allocated to households under China's reformed land ownership structure. ⁶ Estimated yield of plantation is 8 kg seeds
Du'an County Rattan Seed Orchard About 4 hectares of mountainous limestone planted to edible rattan intercropped with <i>Zenia insignis</i> Chun., a legume in the Fabaceae family (its leaves are suitable for farm fodder); Plantation established on a flat terrain (1.3 hectares);	About 95% survival, with observed very poor to poor growth rates (about 0.3 to less than 1.0 m in height after 3 years); some rattan are fruiting. The plantation site on flat terrain has been transformed into a collective farmers group's residential area - as per the National Development and Reform Commission (NRDC)	This mountainous site is occasionally used for cattle grazing; Fresh rattan shoots are preferred to preserved ones. Former project staff continue to monitor growth of rattan plantings every two years. A project with sufficient resources must be put in place to monitor the demonstration plots established in the project. Otherwise, useful information is lost. Some rattan species can grow in poor soils in sites that otherwise have no use at all.
Qingshang Forest Farm (2 hectares) in ECTF in Pinxiang, Guangxing; rattan plantation for	Rattans and trees are in excellent condition; rattan for shoot production and rosewood trees are fruiting;	ECTF staff manage and monitor the plantation in collaboration with RITF staff, primarily as a seed orchard;

⁶ Under China's existing land ownership structure, rural collectives own rural land. The collective, often a village committee, distributes land-use rights to households on 30-year contracts. Farmers are allowed to contract, rent, and exchange or transfer their land use rights.

<p>shoot and cane production inter-planted with Fragrant Rosewood (<i>Dalbergia odorifera</i> T. Chen) Land formerly planted to Masson pine; Rattan and rosewood plantation established in 2008</p>	<p>Surrounding lots of sugarcane plantation maintained for ECTF low-income forestry workers whose families benefit from the harvest;</p>	<p>Technical manual is still being used as reference but should be updated; It's "how to" feature can be suited more for training courses if photos and illustrations are included;</p> <p>Establishment of rattan plantations for shoot production is included in China's 11th Five Year Strategic Plan and should continue in the 12th Strategic Plan as village farmers are really interested in edible plantations, especially for shoots that have components for health and medicinal products.</p>
<p>At the Yingyang Forest Farm (4-5 hectares) in ECTF, Pingxiang; 16 years old rattan plantation</p>	<p>Rattan plantation is very dense, (spacing of 1.0 m); canes are about 3-4 cm in diameter; fruiting is numerous.</p>	<p>ECTF staff continue to manage and monitor the plantation;</p> <p>There is so much wastage in harvesting rattan canes. Better harvesting tools are needed to avoid this.</p>

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