INTERNATIONAL TROPICAL TIMBER ORGANIZATION (ITTO)

PROJECT COMPLETION REPORT

PROJECT IDENTIFICATION

TITLE	Technological Development for the Production of Planting Materials to Support Sustainable Plantation of Bali Indigenous Species through Community Participation
SERIAL NUMBER	PD 386/05 Rev.1 (F)
EXECUTING AGENCY	Provincial Forestry Service of Bali and Regional Tree Seed Centre of Bali and Nusa Tenggara
HOST GOVERNMENT	Government of Indonesia
STARTING DATE	May 2006
ACTUAL DURATION	40 months
ACTUAL PROJECT COST	USD 520,177 (ITTO) USD 1,027,902 (GOI)

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Preface

This completion report of ITTO Project PD 386/05 Rev.1(F), Technological Development for the Production of Planting Materials to Support Sustainable Plantation of Bali Indigenous Species through Community Participation was prepared in accordance with the format provided in manual ITTO for project monitoring, review, reporting, and evaluation 3rd edition 2008.

The Bali Provincial Forestry Service and The Regional Tree Seed Centre for Bali and Nusa Tenggara as the Executing Agency wish to express its sincere gratitude to ITTO, the Ministry of Forestry of the Republic of Indonesia, Centre for Forest Biotechnology and Tree Improvement, Gadjah Mada University, Udayana University as well as farmer groups and stake-holders involved for their dedication during the implementation of the project. Sincere thanks go to the members of the Project Steering Committee for their invaluable advice.

Denpasar, August 2009

PART I. EXECUTIVE SUMMARY

1.1 Background Information About The Project.

1.1.1 Pre-Project situation.

The origin of the proposed project stemmed from an ITTO project PD 137/02 Rev.2 (F) "Demonstration Plantation of *Zantoxylum rhetsa, Manilkara kauki, Alstonia scholaris,* and *Wrightia pubescens* to Promote Sustainable Bali Natural Forest". The above projects have demonstrated the feasibility for the establishment of plantation of indigenous species. Some 150 ha of 4 species tested have been established along with 20 ha of progeny and provenance test plots to select superior trees. Nursery facilities for production of seedlings have also been established. Vegetative propagation technique using tissue culture method has been tested and further development is still required for mass production.

The Provincial Government of Bali recognized the significant importance of the outputs of the project and has decided to adopt the techniques for rehabilitation of degraded land of Bali. However, the government also realized that such an undertaking would require sufficient technical and logistical support. The experience and knowledge acquired in the previous projects would be most appropriate for the successful implementation of the program. The project specifically addressed this issue and provided the required technical support to farmer groups.

1.1.2 The Specific Objectives and Outputs of the Project are:

The Specific Objective of the project is to identify and implement suitable technology for production of high quality planting materials and plantation establishment using Bali indigenous species with community participation.

The following are outputs of the project:

Output 1. Suitable technology of selected species developed
Output 2. Seed orchard maintained
Output 3. Technical guidelines developed and disseminated
Output 4. Forest land use updated
Output 5. Quality planting materials produced and distributed
Output 6. Plantation of 2500 ha established and maintained
Output 7. Developed agroforestry model disseminated and applied
Output 8. Monitoring system developed and applied

1.1.3 Strategy adopted in carrying out the Project

Degradation of tree resources of indigenous species of Bali and the dependency of local community to the timber resources are some of the major issues facing forestry development in Bali. Therefore, to address the issue of land

degradation participation of local community is an important part of the program. The overall strategy to meet the objectives set out in the proposed project is to improve the capacity of local government and local community to carry out successful reforestation and rehabilitation programs of degraded land.

The various activities are determined to ensure that outputs will be delivered in effective and efficient manner. The issue of unavailability of good planting materials will be addressed by providing information on the available seed sources in Bali, maintaining the seed orchards established during the previous project, developing propagation techniques of some difficult-to propagate species, and improving the production facilities.

Since most of the plantation area in Bali where indigenous species occur are in private or community land, it is most important that the community is directly involved in the program. The participation of local community will ensure the successful implementation of the project as well as the sustainability of the plantation program. In order to improve community awareness the project has developed suitable agroforestry model, conducted workshop and training to improve skill.

The local government play an important role in reforestation and rehabilitation program. The lack of success on reforestation in Bali is partly due to the weak operational capacity of the government to plan and carry out such program. To improve the operational capacity the project has attempted to update forest land use map so that planning can be carried out more effectively, develop suitable monitoring and evaluation system and provide a model of successful plantation.

1.1.4 The Project planned duration and planned overall cost

The Project was planned to be operational for 36 months starting from May 2006 to 30th April 2009. However, to allow the completion of some activities, ITTO has granted extension with no additional funding till August 2009. Total budget allocated by ITTO to the Project was USD 597,512 and USD 1,076,662 (GOI).

1.2. Project Achievements.

During the term of the Project all activities as stipulated in the Work Plan have been carried out with varying degree of success. Elaborate planning and effective execution are amongst the factors influencing the successful implementation of project activities. Administrative guidance from the Project Steering Committee has been most useful. The active participation of the Project Officer of ITTO both during the meeting and off the meeting is another important factor in the Project achievements.

1.2.1. Outputs achieved

Major outputs from the Project are:

- Aspects of seed sources and seed technology have been successfully addressed. New seed sources have been designated and appropriate seed handling methods, testing and propagation methods have been developed.
- Assessment of progeny testing of 4 species (*Fagara rhetsa, Manilkara kauki, Alstonia scholaris, Wrigtia pubescens*) has been completed and new progeny testing of 3 species (*Alstonia scholaris, Planchonia valida.*and *Dysoxylum densiflorum*) has been established. Later, these progeny testing will be converted into seed orchard capable of producing genetically improved seeds.
- Production of good quality seedlings to cater for 2670 ha plantation has been successfully accomplished (the target set out in the Project Document was 2500 ha). By the end of the Project, over 1.1 million seedlings have been produced comprising of 6 species. These seedlings have distributed to farmers across 6 District and plantation covering over 2670 ha has been established.
- New agroforestry system based on the local conditions has been developed and disseminated to the community through workshop.
- Technical manuals for seed handling and seedling production have been published and distributed to the community and related organizations.

1.3. Target Beneficiaries Involvement

The Development Objective of the Project is to support the tree planting program of the Provincial Government of Bali as a way of empowering local economy and improving the environmental conditions of Bali. In view of the established plantation and the active involvement of the community, the Project has achieved its objective.

The Project has benefited the farmers in 6 Districts by supplying planting materials, providing technical assistance, technology transfer through training, field study and workshop. A total of 66 farmers groups have involved in various activities during the project term.

The active participation of the local community in the various aspects of the Project activity is very encouraging. As in many other places in Indonesia, sustainability of plantation is often threatened by lack of community participation. The formation of community group to look after the plantation will be used as model for similar activities in other parts of Bali.

The institutional capacity of officials from Provincial Forestry Service and the Regional Seed Centre of Bali and Nusa Tenggara has been improved by their active participation in the planning and implementation and monitoring of the project. The experience in working for an internationally funded project has given them the confidence to carry out similar project in Bali.

1.4. Lessons Learned

It has been recognized that productive plantation can only be achieved through the use of genetically improved planting materials combined with suitable silvicultural practices. For this reason the establishment of progeny test (later will be converted into seed orchard) and designation of seed stands are strategically important for long-term achievement.

The newly established plantation carried out under the Project is expected to have far reaching impact on the local community. Farmers have been motivated to plant Bali indigenous tree species in their private land. Provincial agencies should response to this demand by providing necessary assistance.

Management of a project with such a magnitude requires proper planning, execution, monitoring, evaluation and reporting. Some of the lessons learned from the Project are discussed in the following section.

1.4.1. Development lessons

a. Aspect of project design.

Stakeholder consultation is an important aspect in designing the project. The Project underlined the importance of creating a pool of resources capable of planning and implementing plantation establishment of indigenous tree species. Involvement of District government has an added benefit to ensuring the smooth planning and implementation of the project.

b. Changes in inter-sectoral link.

Government policy is always dynamic to accommodate the progress and development that are taking place. The experience of forestry officers in various aspects of plantation planning, seedling production, linkage with local farmers should be sufficient to cope with changes in government policy.

c. Additional arrangement.

Close contact between the Project personnel and the relevant parties has been instrumental for the successful implementation of the Project activities. Regular visit to the site to monitor the condition of field activities as well as to meet the community was important. Knowledge of local value and tradition has been very useful to convince the community of the importance of the project and the benefit they could obtain.

d. Factors affecting sustainability.

There is a risk that economic pressure could change the mind of the farmers. Farmers could move into activity of better financial return and neglected the plantation. However, well-established plantation would be more resistant to such changes. Furthermore, wood demand for handicraft is still very strong amidst increasing export of handicraft products. The local forestry offices have received inquiries and requests for seedlings of some indigenous species from farmers. This is an encouraging sign as it is believed that farmers have seen the prospect of panting these indigenous tree species. The availability of seed sources, nursery

experience and planting skills should provide sufficient support for farmers to establish small-scale plantation in their village.

1.4.2. Operational lessons

For most of the Project personnel and members of the executing team, this ITTO project was their second experience being involved in an internationally sponsored project. Their participation in the Project provided avenue for many of them to enhance and experience of implementing international standard of work. The success of the Project may be attributed to adequate planning, monitoring and evaluation, professional management, and the good spirit and enthusiasm of those involved in the Project. Some of the operational lessons learned are described.

a. Project organization and management

The role of the Project Steering Committee (PSC) and Project Executing Team (PET) has been instrumental in the successful implementation of the Project. The PSC was primarily responsible for approval of the Project's programs and budgets, annual evaluation and review of project implementation, and approve Progress Reports prior to submission to the ITTO and GOI. The scheduled meeting of the PSC (twice a year) ensured that all Project activities have been reviewed and approved by the highest body of the Project organisation structure.

The PET on the other hand was responsible for carrying out field activities of the Project. Its member includes Project personnel and National experts, The PET meets every 6 months to discuss progress, plan and evaluate field activities. The meeting has also become a venue to discuss technical aspects of conservation and breeding. Therefore, dissemination of results was also taking place at the meeting.

b. Project documentation

The Project activities were well documented by various means such as MoU, Work Plan, Progress Report, Financial Report, Technical Report, and Proceedings etc. These documents have become invaluable source of information not only for Project personnel but also for those who seek to know about the Project outcomes and activities.

c. Monitoring and evaluation

Regular monitoring and evaluation are performed through the PSC meeting. Intensive communication between Project personnel with forestry companies also served as a way of monitoring and evaluating the field works. Most of the problems encountered in the field were often solved by this communication.

d. Roles and responsibilities

Description of roles and responsibility of each unit within the Project organisation structure was critical for the successful implementation of the Project, especially when different agency and company were involved. As described in the Work Plan, each unit namely ITTO, PSC, PET and forestry

companies has specific role and responsibility. Monitoring of the implementation of their role was often conducted during the PSC and PET meetings.

e. Controls over plan and implementation

The Project recognised the importance of the regular meeting of PSC and PET as a means of controls over plan and implementation. Dealing with a project activities as diverse, in term of locations and type of works, as this required certain controls to avoid difficulties. The use of Yearly Plan of Operation and Work Plan as general guidelines of control has been very effective. The use of external auditor particularly to monitor budget and expenditure was also very important.

f. Foreseen external factors

Field activities of the Project involved a wide range of conditions and locations. As most of the populations where genetic materials were collected and conservation plots where seedlings were planted are all in remote areas, logistic and transport often posed a challenge to the team. The determination of the field team to overcome the problems and the support from the forestry company has been instrumental in achieving the field target.

g. Unforeseen external factors

Collection of seeds depends very much on the timing and availability of the seeds in the existing stands. As with other biological system, flowering and fruiting are affected by climatic conditions. Irregularity of raining may interrupt flowering thus rendering it from failure to producing fruits. The more than usual dry season is believed to have influence the seasonal fruiting of *Dysoxylum densiforum*..

1.5. Recommendations

The implementation of the Project was not always trouble-free. Experience taught us that if certain elements of the Project organization had been dealt with adequately the implementation of the Project activities would have been more efficient. Some of the elements that could have been dealt with were clear guidelines on administrative procedure.

The achievement of the Project emphasizes the need to develop a similar work in other areas. When this is materialized collateral implications will flow into local community. Plantation establishment is a concerted work of all stakeholders, and thus efforts should also be spent on developing linkages of all parties involved.

PART II: MAIN TEXT

2.1. Project Content

ITTO Project PD 386/05 Rev.1 (F) focused on supporting the Provincial Forestry Service in establishing plantations of indigenous species of Bali essential for handicraft industry. To achieve this, series of activities have been planned and implemented which included maintenance and assessment of genetic trials (these trials will be an important source of genetically improved seed), refinement of propagation techniques, assessment and establishment of seed sources, production of 1.1 million seedlings, distribution and planting of the seedlings covering more than 2500 ha, training and technical transfer to farmers groups and updating land use map. One of the significant aspects of the Project is the active involvement of local community in the establishment and maintenance of the plantation. Such involvement was achieved by forming farmers group in the area where the plantation was established.

The Project have initiated research and operational activities that could: (1) avert declines in genetic resources of indigenous species, and (2) design and establish genetic trials to produce genetically improved planting materials.

The outputs of this project could be used by the Provincial Forest Service of Bali to promote plantation establishment of indigenous tree species in Bali. Community participation in this Project could be used as model of agroforestry for other places in Bali. Additionally, this project may be utilized as:

- A model to demonstrate the design and establishment of genetic trials of indigenous species;
- Collection of genetic materials for breeding programs to improve health, productivity, and quality of plantations
- Training ground for farmers; and
- Research and demonstration sites for networking, cooperation and partnership with local community, and local as well as national institutions.

The project was undertaken and managed by the Provincial Forestry Service of Bali, in cooperation with the Tree Seed Regional Centre of Bali and Nusa Tenggara. National experts from University of Gadjah Mada Yogyakarta, University of Udayana Bali and Centre for Forest Biotechnology and Tree Improvement Yogyakarta assisted in carrying out the Project activities.

2.2 Project Context

The Government of Indonesia has taken a number of initiatives to address the problems of deforestation and forest degradation including the formulation of an Indonesia Forestry Action Programme (IFAP). The policy set up in the IFAP was driven by three policy imperatives: i). Protection of forest ecosystems; ii). Sustaining multiple goods and services provided by forests and to benefit present and future generations; and iii). Ensuring the proper consideration of the views and expertise of all people affected and involved in forest-related activities.

The current forestry sector strategic plan is Renstra 2005-2009. It indicates 4 goals (improved quality and productivity of the forest resource; reduced rate of forest resource degradation; implementation of efficient, fair and sustainable forest management system; and increased contribution of forest resources to the nation's economy and community's prosperity) and 6 programmes (forest and land rehabilitation; forest protection and nature conservation; optimisation of forest function and utilization; consolidation of pre-conditions for forest resource management; institutional development and promotion of community services).

2.3 Project Design and Organization

2.3.1 Project design

An important feature of this Project was its focus on involving the community in the establishment and maintenance of the plantation. The involvement was not restricted to giving wages for their services and allowing them to plant cash crops in between the planted trees, but also in the long-term management of the plantation. This was achieved by forming a farmer group in the area where plantation was established. It is expected that such community participation would ensure the sustainability of the plantation.

The Provincial Government of Bali since 2003 has set out to embark on rehabilitation of degraded forest popularly known as Bali Greening Program. Experience in the past has demonstrated that part of the failure in having a successful plantation was the inability of the local organization to provide good quality planting materials. The Project focused on providing technical support for establishing plantation of indigenous trees and maintaining the genetic tests so that genetically improved materials of the selected species would be available for productive plantation. Technical support focused on production of planting materials at reasonable cost, upgrading of nursery facilities, training for farmers. Works toward producing genetically improved materials stemmed from the on-going genetic test established by the previous project.

The specific objective of the Project is to identify and implement suitable technology for production of high quality planting materials and plantation establishment using Bali indigenous species with community participation.

Propagation techniques developed by previous ITTO projects (PD 137/02) will be further developed and applied. Genetic improvement trials established by the previous ITTO project (PD 137/02) is still in progress. Data collection and analysis have been carried out before improved genetic materials can be made available. Genetic improvement of other species has been initiated to cater for future demand. The goal of this work would be to have seed sources of genetically improved materials.

Concurrently, seeds from identified seed sources has been collected and used to produce planting materials sufficient to plant 2500 ha plantations. These planting materials will be distributed to farmers and local community for planting in private or community land. The involvement of local community will be facilitated by agroforestry system suitable to local custom. Nursery facilities and infrastructure would be improved to cope with the demand to produce 1.1 millions plants.

Administrative capacity of the provincial government is also critical for the successful reforestation and rehabilitation program, and has been strengthened by improving the land use map and monitoring system. An international expert has been invited to assist in developing effective monitoring system.

2.3.2. Project rationale

Deforestation of all kinds is increasingly becoming a major problem in Indonesia. Plantation forest is considered one of the most viable ways of fulfilling many of the productive and protective roles of the natural forest that were lost due to deforestation.

The program of plantation establishment when successful would be a major breakthrough in the attempts to recover the loss of timber supply from deteriorating forests. Appropriate techniques and good quality planting materials are identified as the important contributing factor for the successful implementation of this program. The experience and technical knowledge acquired in the previous project would be most suitable to support this program.

In Bali the deterioration of natural resources especially those providing raw materials of handicraft industry could have serious implications. The proposed project complements the reforestation and plantation establishment of the Government of Indonesia. This program is expected to set example for farmers to plant trees in their land. From the viewpoint of conservation of forest genetic resources, this project also stimulated the national program to enhance capabilities for conservation and genetic improvement of indigenous species.

2.4 Project Implementation

The Project agreement was formally signed on 1 February 2006. Upon the signing of the agreement the Executing Agency started to commit itself in the implementation of the Project activities. The project was initially planned for 36

months (from May 2006 to April 2009). However, because some activities had not been completed, ITTO has granted the Project an extension until August 2009 with no additional funding.

2.5 Project Results

2.5.1 Existing situation at project completion

One of the most significant outputs when the Project was completed is the establishment of 2670 ha plantation in both private and public land across 6 Districts of Bali. Apart from the covered area, the significance of the output is also due to the fact that, the work was carried out by local farmer groups. Some 66 farmer groups have participated in the program. Another important aspect of this planting program is the enthusiasm of the community to plant indigenous tree species. Requests from individual farmers and community group have been received by the Forestry Service asking for seedlings to be delivered to their areas. This is very encouraging sign for the Provincial Government to continue the Bali greening Programme capitalizing on the interest of the community to plant trees.

At the completion of the Project, some 7 seed sources have been established, consisting of 4 progeny trials, 2 seed orchard and 1 seed stands. For future planting program, seed requirement would have to be collected from these seed sources.

The newly established plantation and the enthusiastic mood of the community have given new hope to the handicraft industry which at the moment has been relying on wood imported from other islands (non-indigenous wood).

2.5.2 Achievement of the specific objective

The Project's Specific Objective was to identify and implement suitable technology for production of high quality planting materials and plantation establishment using Bali indigenous species with community participation. This specific objective has been achieved through the completion of a series of outputs, namely: 1). Suitable technology of selected species developed; 2). Seed orchard maintained; 3). Technical guidelines developed and disseminated; 4). Forest land use updated; 5). Technical guidelines developed and disseminated; 6). Plantation of 2500 ha established and maintained; 7). Developed agroforestry model disseminated and applied and 8). Monitoring system developed and applied.

2.5.3 Impact of the Project results on the sectoral programme, on the physical environment, on the social environment and on target beneficiaries.

The Project results have a certain degree of direct impact on the Sectoral Program, but it would be difficult to quantify since it would involve long-term observation on government policy. The Project most significant impact is on the physical environment, social environment and the target beneficiaries. The presence of successful plantation has had significant impacts on the physical environment of the community.

Impacts of the Project results on target beneficiaries could be seen from the benefits received by:

- Community/farmer group
  The local community has directly benefited from the project by getting technical training on aspects of seed collection, nursery and plantation techniques. They also benefited from being supplied with good quality planting materials and having the established tree stand.

- Forestry officer
  Forestry officers at the Bali Provincial Forest Service, Regional Tree Seed Centre of Bali and Nusa Tenggara and District Forest Service have benefitted from the project in different ways. In term of project design, the first two organizations were directly involved in the planning, implementation and monitoring of the project activities. This experience should be useful to improve their professional capacity.

2.5.4 Project sustainability after project completion as a result of project conceptualization, assumption made and conditions prevailing at completion

Based upon what has been achieved and the outcome of some of the major outputs, there is a strong indication that major activities of the project will be sustained long after the project completion.

2.6. Synthesis of the Analysis

Project Elements	Indicators	Summary	Status
Specific Objective: To identify and implement suitable technology for production of high quality planting materials and plantation establishment using Bali indigenous species with community participation		Technology for production of high quality planting materials has been developed and used. Local community represented by 66 farmers groups in 6 Districts across Bali has established plantations of 2670 ha comprising of 6 species.	Completed and objective achieved.
Outputs 1. Suitable technology of selected species developed 1.1.1. Identification seed sources and seed collection for 6 selected indigenous species (*Zantoxylum rhetsa, Manilkara kauki, Alstonia scholaris, Wrightia pubescens, Planchonia* sp, *Dysoxylum* sp) 1.1.2. Further development of propagation techniques for the	• Seed sources for six species identified and the seed collected by the end of 2007 in: 1. *Dysoxylum* sp (Karangasem, Tabanan District) 2. *Manilkara kauki* (Buleleng District) 3. *Fagara rhetsa* (Gianyar, Badung, Buleleng District) 4. *Wrightia pubescens* (Buleleng District) 5. *Planchonia*, sp (Jembrana Districts)	• 3 seed stands and 20 sites of seed trees throughout Bali and Lombok Islands have been identified as seed source for six species (*D.densiflorum, A.scholaris, P.valida, M.kauki, F.rhetsa*, and *W.pubescens).* Seed collection and procurement of six species was conducted in order to produce 1,1 million seedlings for Pejarakan Nursery. Total amount of 1,133 kilogram seeds of six species have been collected. • The propagation method developed for the species have had some success. Further refinement of the method is still necessary to further improve the success rate. Propagation	Completed and output achieved

Project Elements	Indicators	Summary	Status
selected species 1.1.3. Comparative study on propagation techniques to Queensland, Australia 1.1.4. Field trial of genetic material and site manipulation, 6 ha	6. *Alstonia scholaris* (Jembrana District, South Sumatera Province) • Reports of the study trip to Australia produced by the end of 2007 • 22000 plants for 20 ha for six species, are raised and available planting in 2007. • Six ha of field trial of seedlings, cuttings, and tissue culture propagules established in Tegal Bunder in 2007	by tissue culture has had some limited success. For an easy to propagate species such as *W.pubescens*, tissue culture propagation could be used to produce selected clones. As far as the method is concerned, the protocol developed for the species has been effective • The comparative study to Queensland has been conducted. The tour has been very useful for the participant in getting some knowledge about propagation techniques, nursery and tree improvement program. • Field trial of genetic materials and site manipulation has been established	
1.2. Seed orchard maintained 1.2.1. Establishment of seed orchard for 3 species (*Alstonia scholaris Planchonia valida* and *Dysoxylum densiflorum*); 6 ha 1.2.2. Maintenance and assessment of existing seed orchard for 4 species (*Z. rhetsa, M. kauki, A. scholaris, W pubescens*), 26 ha 1.2.3. Upgrading access to the seed orchard	• 4 existing seed orchards covering 20 ha in Sumber Klampok are well maintained and data collected and analyzed.	• Seed orchard has been established for 3 species, namely *Alstonia scholaris Planchonia valida* and *Dysoxylum densiflorum*. • Assessment and maintenance of seed orchard for 3 species have been conducted and data collected and analyzed. • Assessment, maintenance, and thinning of the existing orchard have been carried out. The seed orchards would ensure the availability of genetically improved seeds for plantation establishment. Further development of plantation by government and local community should use seeds from	Completed and output achieved

Project Elements	Indicators	Summary	Status
		these orchards. • Upgrading of road access to the orchards has been completed. A total of 1.3 km road has been upgraded.	
1.3. Technical guidelines developed and disseminated 1.3.1 Preparation, reproduction and dissemination of 12 technical guidelines on seed handling and planting for the species 1.3.2 Organize 1 regional workshop on propagation technologies	• 12 technical guidelines on tree production and agroforestry for 6 species produced and distributed before the end of 2007, and more than 80% farmer groups are applying them before the end of 2008 • A one day-workshop on propagation technique organized and attended by 18 farmer group leaders from six districts by March 2007.	• The total 12 guidelines of seed handling and planting for 6 species have been printed and distributed to farmer groups and stakeholders involved. • One regional workshop on propagation technologies has been conducted. Dissemination of technologies through workshop and technical guidelines has given farmers sufficient knowledge and experience of seed germination, nursery and planting techniques.	Completed and output achieved
1.4. Forest land use updated 1.4.1. Data collection and analysis of social economic and biophysics 1.4.2. Updating the land use plan	• 250 copies of updated and approved forest land use maps of six districts are disseminated before March 2007 • A one day-workshop for 20 participants from sub-districts in charge of planting organized March 2007	• Physical and economic survey has been carried out. Map of planned site of plantation has been produced and disseminated to local Forestry Service in six Districts across Bali. • Workshop on updating the land use plan has been held, and 30 participants had taken part in this workshop. • Land use plan has been updated. In general the updated map is useful for the local authority in the planning and implementation of land rehabilitation and reforestation. For the project	Completed and output achieved

Project Elements	Indicators	Summary	Status
		the map would be useful to identify the area for distribution of planting materials and for the setting up of permanent sample plots.	
1.5. Quality planting materials produced and distributed 1.5.1. Improve capacity to produce and distribute planting materials 1.5.2. Distribution of planting materials to participating communities 1.5.3. Administration and documentation of planting materials developed	• 1 ha nursery facilities in Sumber Klampok upgraded before the end of 2006. • 1.1 millions seedlings (325.000 by the end of 2006: 374.000 seedlings by the end of 2007: 374.000 seedlings by the end of 2008) produced and distributed to communities in six districts	• Upgrading road access from the main road to the nursery, a distance of 1.65 km and nursery capacities consist of Shaded area of 400 m2, open area of 800 m2, media processing area of 25 m2, and office area of 36 m2 have been established. • Total seedling had been produced by the project up to April 30, 2009 was 1.278.485 seedlings (produced target 1.100.000 seedlings). Total of 1,175,000 seedlings or equivalence 2,670 ha have been distributed to farmer groups in 6 Districts across Bali from 1,100,000 seedlings targeted. • Administration and documentation of planting materials developed.	Completed and output achieved
1.6. Plantation of 2500 ha established and maintained 1.6.1. Technical assistance for establishing 2500 ha plantation 1.6.2. Establishment and measurement of permanent sample plots 1.6.3. Establishment of demonstration plot of	• Plantation of 2500 ha (2006: 800 ha, 2007: 850 ha, 2008: 850 ha) established in 6 districts (Karangasem: 700 ha, Buleleng: 675 ha, Bangli: 325 ha, Klungkung: 225 ha, Tabanan: 200 ha, Jembrana: 375 ha)	• As of April 2009, around 2,670 ha plantation has been established in 6 Districts across Bali. Extension of planting technique to farmer group is carried out to 66 farmer groups involved in 6 Districts across Bali. • The sample plots have been established in 9 plantation sites by farmer groups in 5 Districts across Bali. • 20 ha of demonstration plot of 2 species	Completed and output achieved

Project Elements	Indicators	Summary	Status
2 species (*Planchonia sp.* and *Dysoxylum sp.*), 20 Ha 1.6.4. Maintenance of demonstration plots of 6 species; 150 Ha		(*D.densiflorum* and *P.valida*) have been established and maintained. • The demonstration plot of 4 species, 150 Ha has been maintained.	
1.7. <u>Developed agroforestry model socialized and applied</u> 1.7.1. To adopt the existing model to farmer groups and forestry officers in 6 districts 1.7.2. To review and refine the agroforestry model 1.7.3. To socialize the agroforestry model 1.7.4. Farmer leaders trained	• 1 day-workshop on agroforestry model organized for 20 farmer leaders before the end of 2007 • Agroforestry model adopted in 6 districts by at least 15% farmer groups before March 2007, and 60% before March 2008 • Increased community awareness and participation before the end of 2007, and the rate of tree planting in the 6 districts increased by at least 50%.	• Agroforestry models have been developed for different areas, tree species and land tenure. Workshop on agroforestry models have been conducted and four models of agroforestry had formulated as follows: o Model I is a mix of indigenous tree spesies as the main stands with selected intercropping according to farmers' interest. o Model II is a mix of indigenous tree species as hedgerows and border of farmer's owned lands, combined with species preferred by farmers. o Model III is a mix of indigenous tree species as inserted trees between the existing main crops o Model IV is a model with indigenous tree species as countur hedgerows on slopping lands. • The training and study tour for farmer leaders have been implemented..	Completed and output achieved

Project Elements	Indicators	Summary	Status
		• Publication of agroforestry model comprising poster, leaflet, guideline, and proceeding have been printed and disseminated to farmer groups and stakeholders involved.	
1.8. Monitoring system developed and applied 1.8.1. Formulation of monitoring and evaluation systems 1.8.2. Documentation and reporting 1.9. Activities of project extension 1.9.1. Assessment and maintenance field trial of the genetic materials and site manipulations, 6 Ha 1.9.2. Mapping of planted area	• Monitoring and evaluation guidelines are available at the end of year 2006. • Improved project monitoring capacity of the Executing Agency - 1 staff meeting every quarter - Reporting is regular • Field trial of the genetic materials and site manipulation, 6 ha is maintained and data collected and analyzed • Map of planting area by farmer groups in 6 Districts across Bali printed and distributed to stake holder involved.	• Monitoring and evaluation system formulated and applied. • Documentation and reporting implemented. • Assessment and maintenance of field trial of the genetic materials and site manipulation has been maintained and measured as scheduled. Data have been collected and analyzed by the expert involved. • Map of planting area by farmer groups in 6 Districts namely Bangli, Buleleng, Karangasem, Klungkung, Jembrana, and Tabanan has been printed and distributed to stake-holder involved. • This map would be very useful to facilitate monitoring and evaluation by related	Completed and output achieved

Project Elements	Indicators	Summary	Status
		institutions.	
1.9.3. Workshop on strengthening the institutional capacity of farmer groups	• One regional workshop on strengthening the capacity of farmer groups for 100 participants on various aspect of institution and management before August 2009 • Establish network among farmers to extend their interactions.	• The workshop was implemented on 28 July 2009. Total of 110 participants have taken part in the workshop. The participants were farmer leaders, craftsman, extension staff and staff of Provincial and District Forestry Services, staff of Regional Tree Seed Centre for Bali and Nusa Tenggara, and stake holder involved. The instructors of the workshop were staff of Provincial Cooperation Service (*Dinas Koperasi*), Provincial Industry and Commerce Service (*Dinas Perindustrian dan Perdagangan*), Provincial Forestry Service (*Dinas Kehutanan*), and Indonesian Exporter of Handicraft Association (*Asephi*). • The participants of workshop agreed for the need of communications forum among forest farmer group with the related institutions (Cooperation Service, Industry and Commerce Service, Indonesian exporter of handicraft association, and Forestry Service) as means to exchange the information of the availability of raw material, market and mechanism of strengthening the institution of farmer groups.	
1.9.4. National workshop on dissemination of project outputs and outcomes	• One national workshop on dissemination of project outputs and outcomes for 100 participants in August 2009 • Dissemination of project outputs and outcomes to the stakeholders	• Workshop on dissemination of project outputs and outcomes has been conducted and total 105 participants took part in the workshop. The participants were staff of MoF, national experts, staff of Provincial and Districts Forestry Services, Bali Provincial Government, Regional Tree Seed Centre for Bali and Nusa Tenggara, farmer leaders, extension staff, and	

Project Elements	Indicators	Summary	Status
		related stake-holder. • The recommendations of the workshop are as follows: – Continuing the distribution of local species to community for free through community participation. – Four agroforestry models that have been formulated by the project could be applied for planting system in the field. – The existing trials such as seed orchards, demonstration plots, field trial, and planting by farmers should be maintained and monitored regularly by related stake-holders. – Regulations to control the use of seeds from seed orchards are necessary. – Sustainable training and extension activity for farmers to improve their knowledge of planting maintenance – Other local species such as cempaka (*Michelia champaca*) and waru *(Hibiscus tiliaceus)* is to be cultivated. – Expected to make success story of the project – To suggest the Bali Hindus Council to recommend that *Alstonia scholaris* is not a mystical plant and farmers can plant the tree species as there is a strong demand of the timber for handicrafts.	

PART III: CONCLUSIONS AND RECOMMENDATIONS

The project has successfully completed all of the activities set out in the project document. The foundation for good practices of planting quality trees of Bali indigenous species therefore has been laid out. Local community have sufficient skill and knowledge on selection of seed source, seed harvesting and handling, seedling production and planting technique.

In addition to the completion of field activities, another important outcome of the project is the strong enthusiasm of the farmers to plant Bali indigenous species. The Bali Provincial Forest Service has received request from local community for more seedlings. This planting spirit of the community should be maintained and disseminated to others. This should be beneficial to the implementation of rehabilitation and reforestation/planting program.

In the next 4 to 5 years some of the tree species planted under this project would be ready for harvesting. There is already a strong demand for these timber species as supply is diminishing and the increase of wooden handicraft products. It is important that efforts should be made to maintain the interest in planting trees of the community by providing incentives and facilities.

1. Development Lessons

The issues being addressed by the Project were very much relevance to the local needs. In the past, example of successful plantation was rare. This lack of success was partly due to the poor planning, poor implementation, insufficient budget allocation and lack of qualified human resources. The experience from this Project has been very useful both for the local forestry officers as well as the local community.

The well-established tree stands of Bali indigenous species in various villages across Bali, seed orchard, seed stands and seed production area would be a significant achievement of the project. Since the local community is directly involved this would encourage the local forestry office and the community to plant trees in non-productive land.

2. Operational Lessons

The success of the Project may be attributed to adequate planning, monitoring and evaluation, professional management, and the good spirit and enthusiasm of those involved in the Project. This project was the second ITTO project being implemented by Bali Provincial Forest Service. There is no doubt that the experience from the previous project had been very useful. Some of the operational lessons learned are described.

- **Project organization and management**

The role of the Project Steering Committee (PSC) and Project Executing Team (PET) has been instrumental in the successful implementation of the Project. The PET is responsible for carrying out field activities of the Project. Its member includes Project personnel and national experts. The PET meets regularly to discuss progress, plan and evaluate field

activities. The meeting has also become a venue to discuss technical aspects. Integration of project activities into the system within the Bali Provincial Forest Service ensured the support of all parties involved.

- **Project documentation**

The Project activities are well documented by various means such as MoU, Work Plan, Annual Report, Financial Report, Technical Report, Training Report etc. These documents have become invaluable source of information not only for Project personnel but also for those who seek to know the Project activities. Project documentation in multimedia format is also very useful, particularly for dissemination of project results and findings to a wider audience. The project has produced a video documentation explaining various activities being implemented the during project duration.

- **Monitoring and evaluation**

Regular monitoring and evaluation are performed through the PSC meeting. Intensive communication between project personnel with farmers groups and leaders served as a way of monitoring and evaluating the progress of field works. Most of the problems encountered in the field were often solved by this communication. The monitoring and evaluation system developed by an international expert hired by the project has helped the PET to keep track of the progress. It is expected that similar approach would be adopted by government agencies involved in the project.

- **Roles and responsibilities**

Description of roles and responsibility of each unit within the Project organisation structure is critical for the successful implementation of the Project, especially when different agencies are involved. As described in the Work Plan, each unit namely ITTO, PSC, PET has specific role and responsibility.

- **Controls over plan and implementation**

The Project recognise the importance of the regular meeting of PSC and PET as a means of controls over plan and implementation. Dealing with a project activities as diverse, in term of locations and type of works, as this requires certain controls to avoid difficulties. The use of Work Plan as general guidelines of control has been very effective. The use of external auditor particularly to monitor budget and expenditure was also very important.

- **Foreseen external factors**

Field activities of the Project involved dry and harsh condition. The determination of the field team to overcome the problems and the support from the community has been instrumental in achieving the field target.

When working with farmers it is important to have a good understanding of their cultural value. In this regard the national expert and extension worker involved have played critical role to have the support of local community to carry out the planting activities.

Since most of the planting were on their private land, it would have been impossible to achieve planting the targeted area of 2500 ha.

- **Unforeseen external factors**

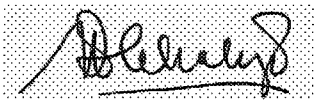
Any project that involved planting of seedlings is dependant upon climatic condition. This was also experienced by the project when seed collection of majegau (*D.densiflorum*) was delayed due to late flowering. Long dry spell has affected the flowering and fruiting season of the tree species.

Responsible for the report

Name : Magdalena Hehakaya

Position held : Project Manager

Date : August 31, 2009

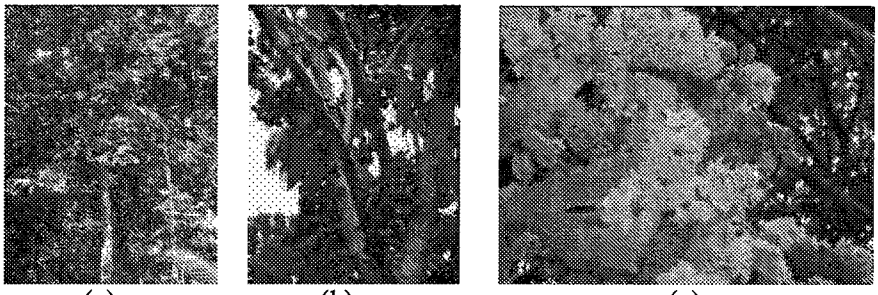
Signature : 

Appendix 1. Photographs of the Project activities

The 6 Bali indigenous tree species

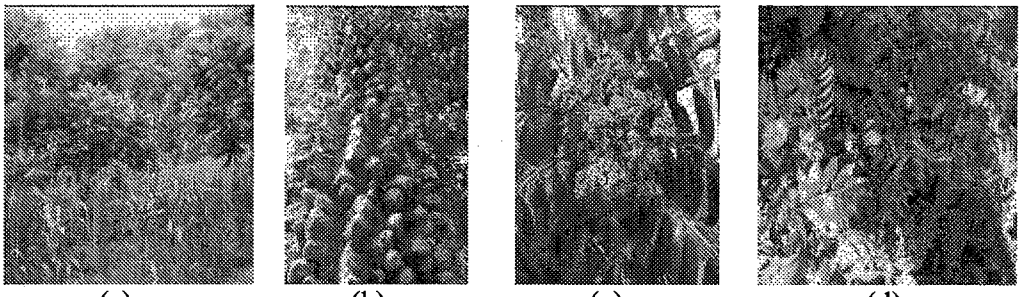
(a) (b) (c) (d)

Picture 1. *Wrightia pubescens*: (a) tree; (b) fruiting; (c) flowering; (d) fruit and seed



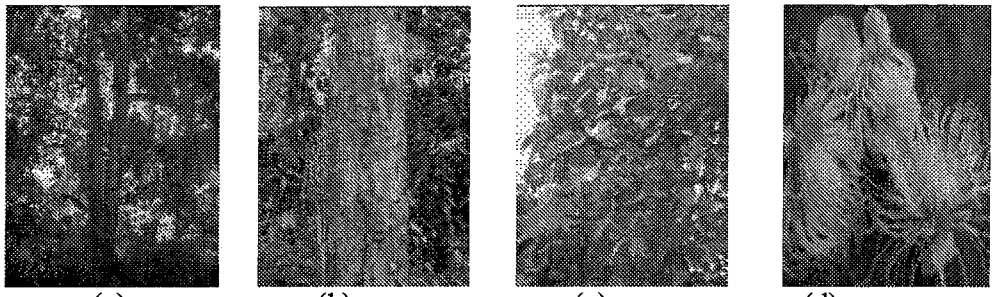
(a) (b) (c)

Picture 2. *Dysoxylum densiflorum*: (a) tree; (b) fruiting; (c) flowering



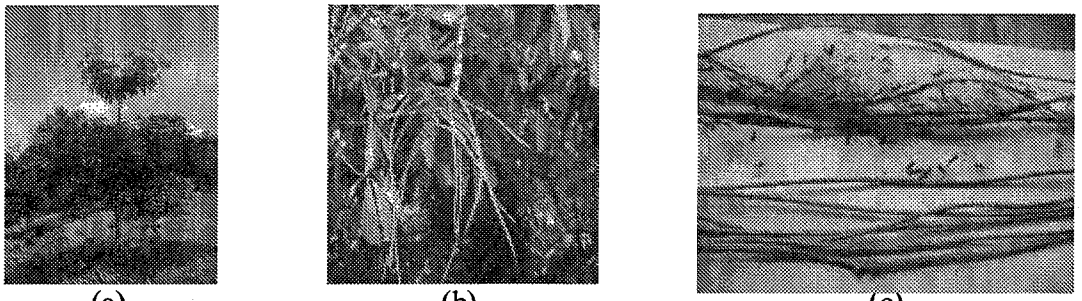
(a) (b) (c) (d)

Picture 3. *Fagara rhetsa*: (a) tree; (b) stem; (c) flowering; (d) fruiting



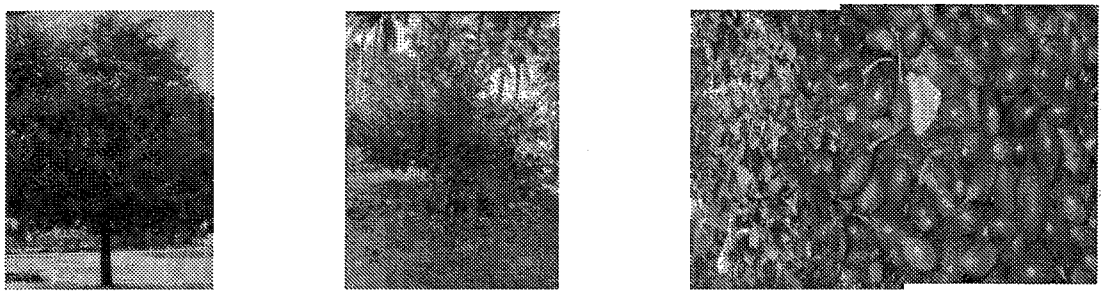
(a) (b) (c) (d)

Picture 4. *Planchonia valida*: (a) tree; (b) stem; (c) fruiting; (d) flowering



(a) (b) (c)

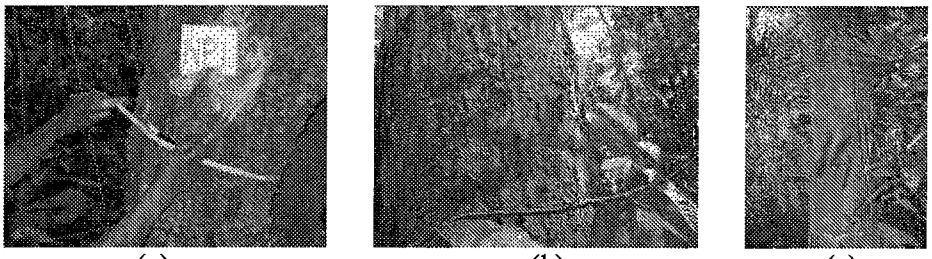
Picture 5. *Alstonia scholaris*: (a) young tree; (b) fruiting; (c) seed



(a) (b) (c) (d)

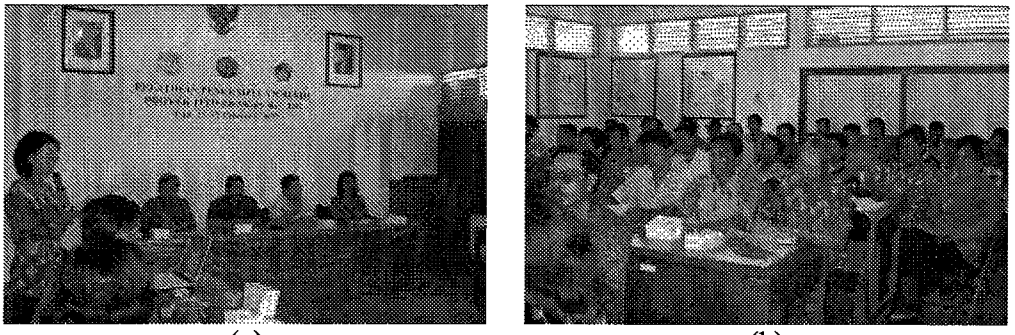
Picture 6. *Manilkara kauki*: (a) tree; (b) young tree; (c) fruiting; (d) mature seed

Output 1. Suitable technology of selected species developed

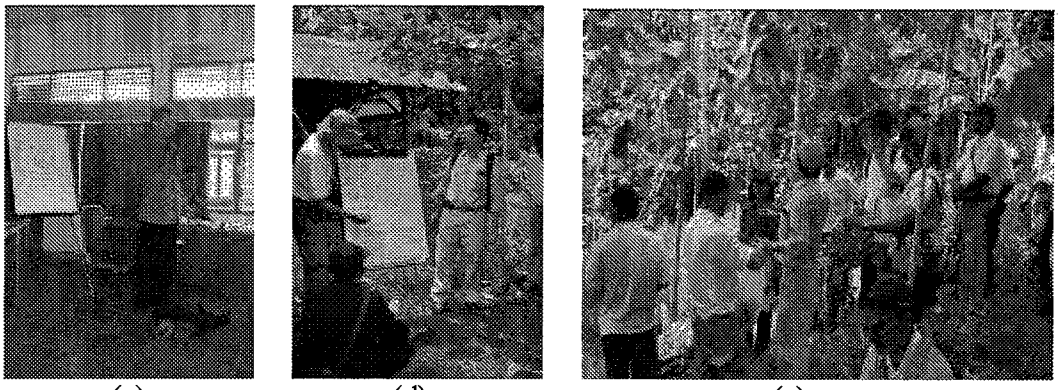


(a) (b) (c)

Picture 7. Identification of seed sources; measurement of stem diameter (a), numbering of seed source (b) and (c)

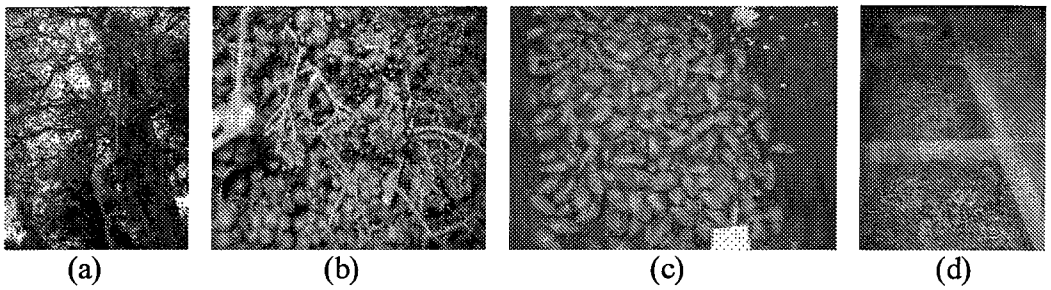


(a) (b)

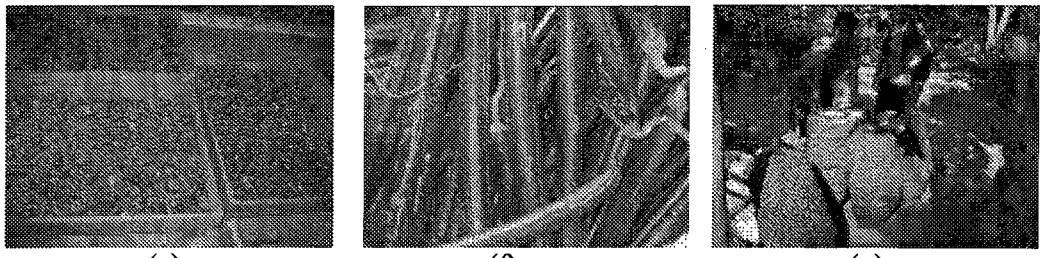


(c) (d) (e)

Picture 8. Training on seed collection; opening ceremony (a), participants of the training (b), theoretical in class (c), theoretical in field (d), discussion in the field (e)

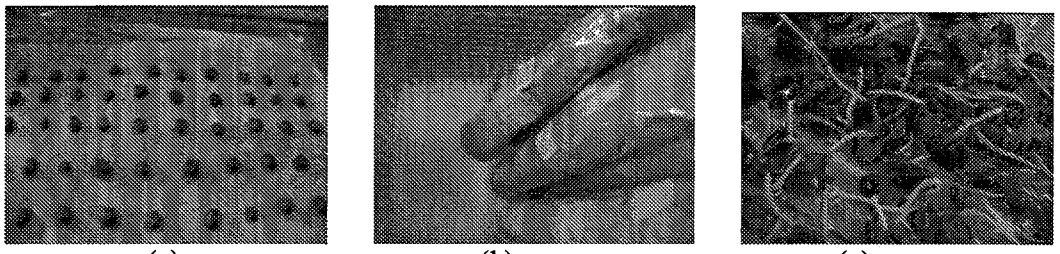


(a) (b) (c) (d)

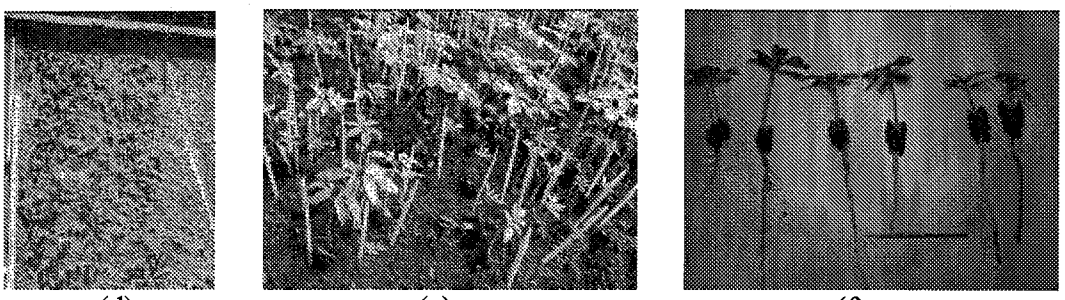


(e) (f) (g)

Picture 9. Seed collection (a); seed of *Fagara rhetsa* (b), *Planchonia valida* (c), *Alstonia scholaris* (d), *Manilkara kauki* (e), *Wrightia pubescens* (f), and *Dysoxylum densiflorum* (g)

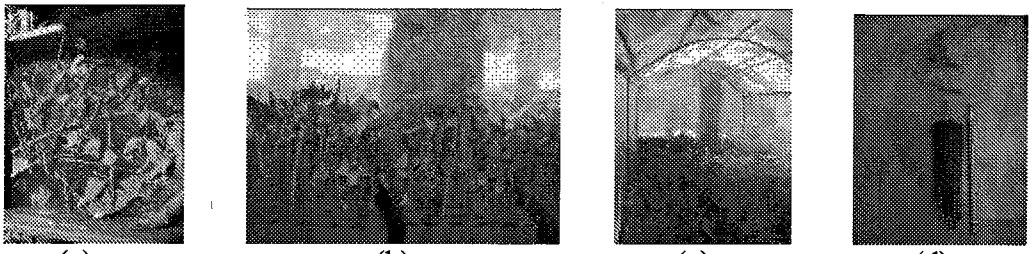


(a) (b) (c)



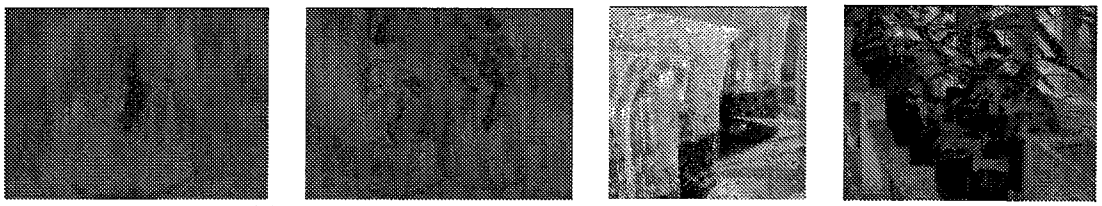
(d) (e) (f)

Picture 10. Seed quality testing in laboratory (a), (b), and (c); in the RTSC nursery (d), (e), and (f)



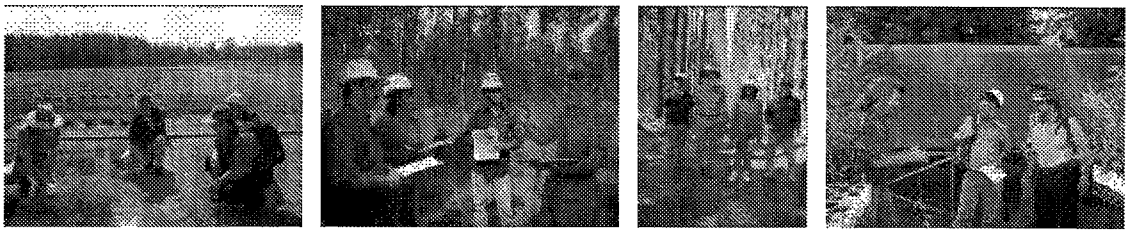
(a) (b) (c) (d)

Picture 11. Cutting propagation technique; material of cutting (a), planting in polytube (b), acclimatisation in plastic house (c), seedling with root (d)

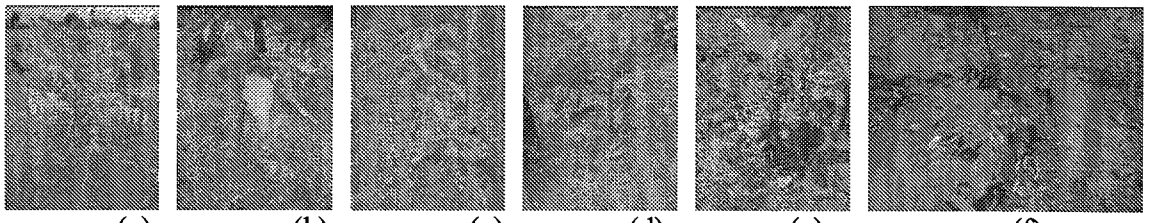


(a) (b) (c) (d)

Picture 12. Tissue culture technique



Picture 13. Comparative study to Queensland



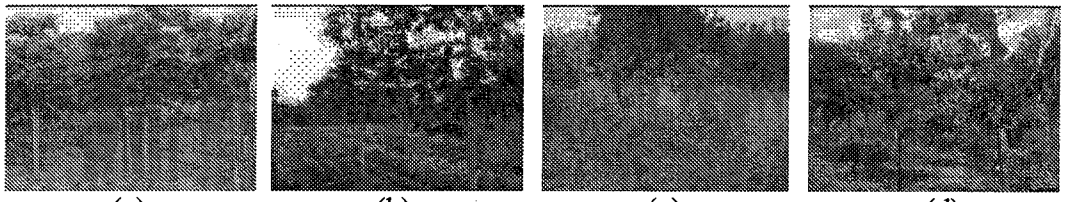
(a) (b) (c) (d) (e) (f)

Picture 14. Field trial of the genetic material and site manipulation: *Fagara rhetsa* (a), *Planchonia valida* (b), *Alstonia scholaris* (c), *Wrightia pubescens* (d), *Manilkara kauki* (e), and *Dysoxylum densiflorum* (f)

Output 2. Seed orchard maintained

(a) (b) (c) (d)

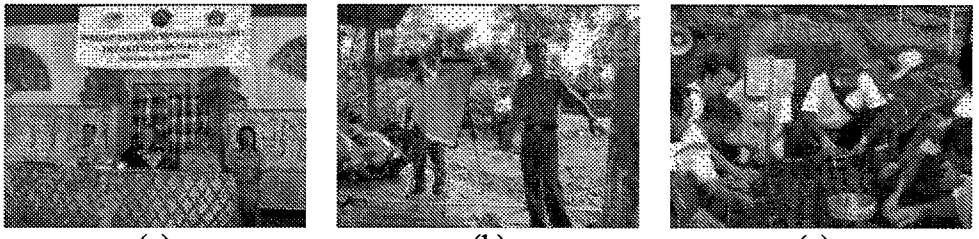
Picture 15. Establishment of seed orchard 3 species: labelling (a), *Alstonia scholaris* (b), *Dysoxylum densiflorum* (c), and *Planchonia valida* (d)



(a) (b) (c) (d)

Picture 16. Seed orchards *Fagara rhetsa* (a), *Wrightia pubescens* (b), *Manilkara kauki* (c), *Alstonia scholaris* (d)

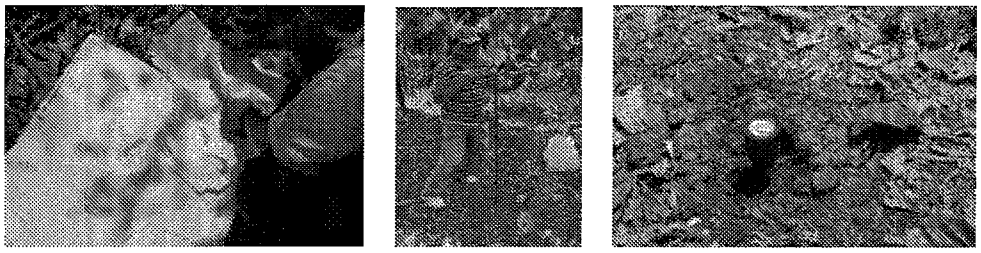
Output 3. Preparation, reproduction and dissemination of 12 technical guidelines



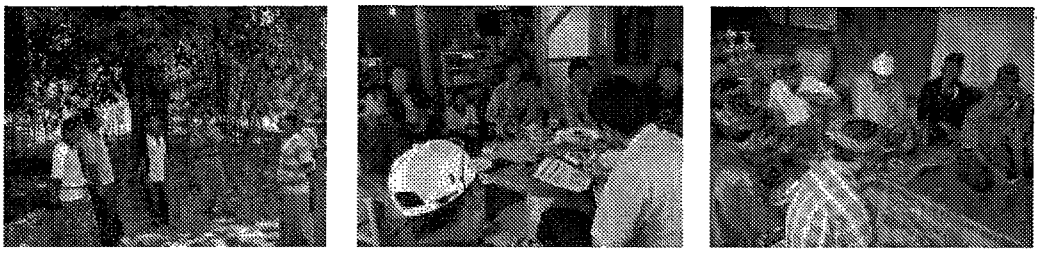
(a) (b) (c)

Picture 17. Workshop on propagation technologies: opening ceremony (a), theoretical in the field (b), practicing of planting seedlings in polybag (c)

Output 4. Forest land use updated



Picture 18. Physical survey in 6 Districts across Bali

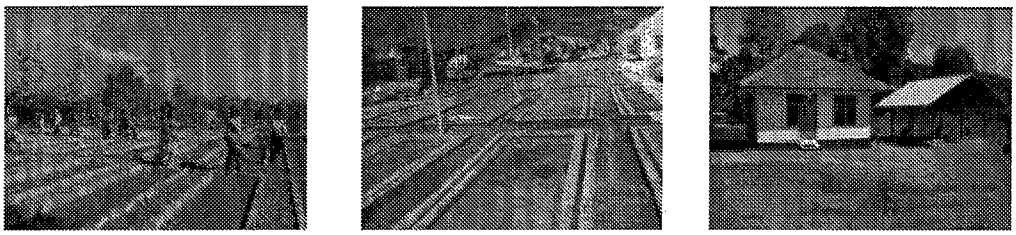


Picture 19. Social-economic survey in 6 Districts across Bali

Picture 20. Workshop on updating the land use plan

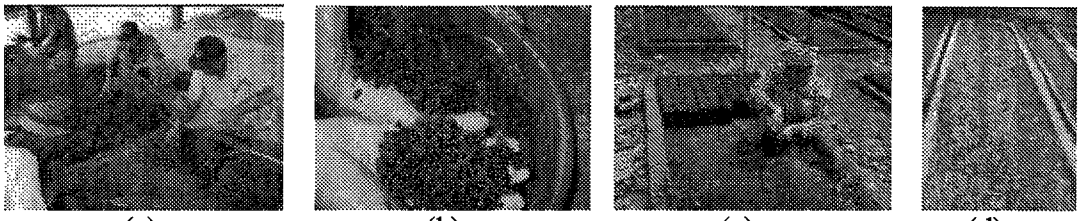
Output 5. Quality planting materials produced and distributed

Picture 21. Upgrading road access from main road to the nursery

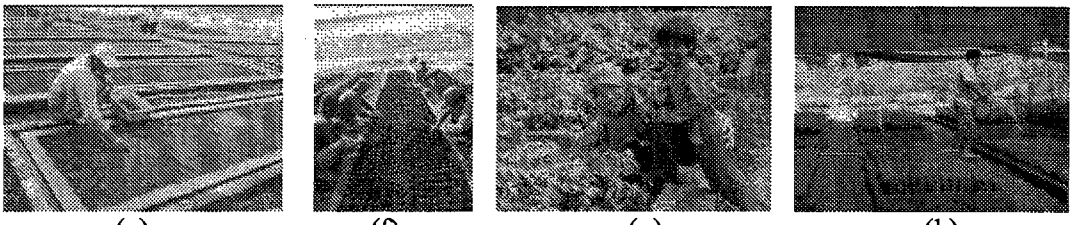


(a) (b) (c)

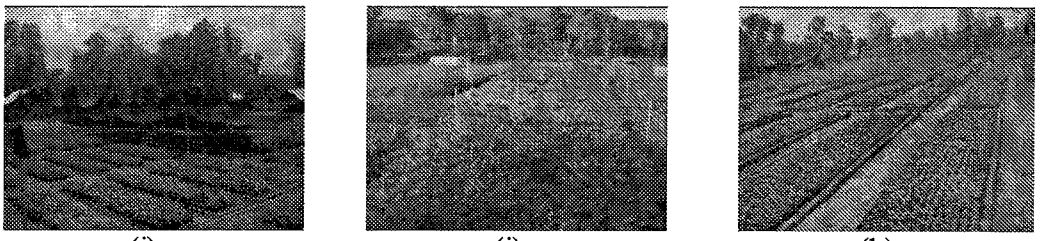
Picture 22. Upgrading nursery capacities: open area (a), Shading area (b), office and processing area (c)



(a) (b) (c) (d)



(e) (f) (g) (h)



(i) (j) (k)

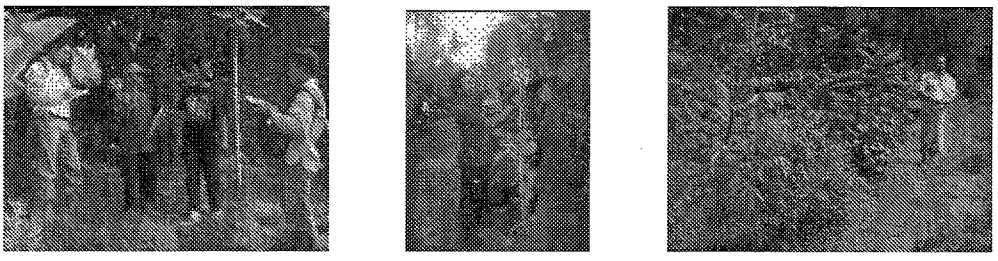
Picture 23. Provision planting materials: Seed extraction (a), (b); fulfil media to polybag (c); seedlings in the germination bed (d); pricking out seedlings (e); planting seedlings into polybag (f); weeding (g); watering (h); nursery area (i), (j) and (k)

(a) (b) (c)

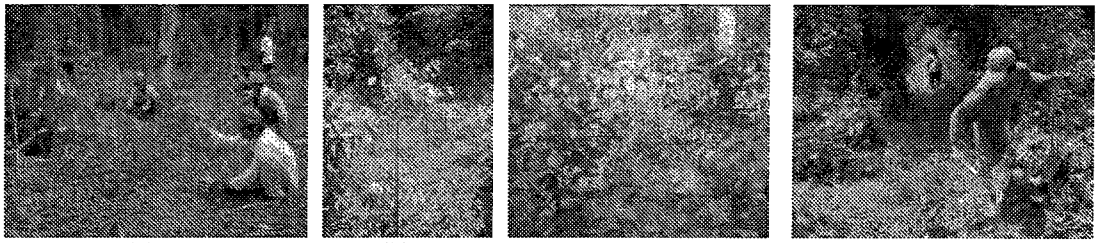
(d) (e) (f)

Picture 24. Distribution of the planting materials to farmer groups involved

Output 6. Plantation of 2500 ha established and maintained



Picture 25. Establishment and measurement of permanent sample plots



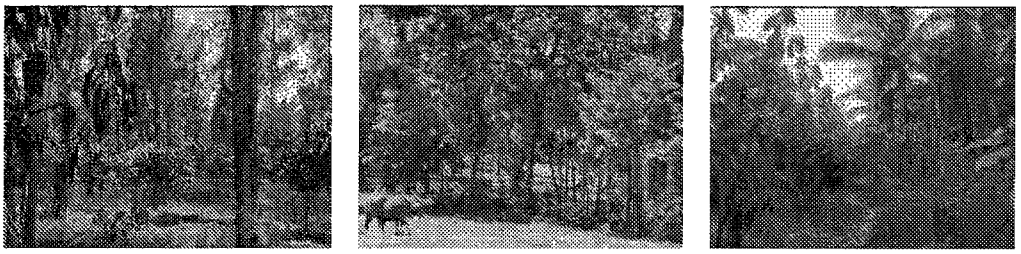
(a) (b) (c) (d)

Picture 26. Establishment and maintenance of demonstration plot of 2 species *Dysoxylum densiflorum* (b) and *Planchonia valida* (c)

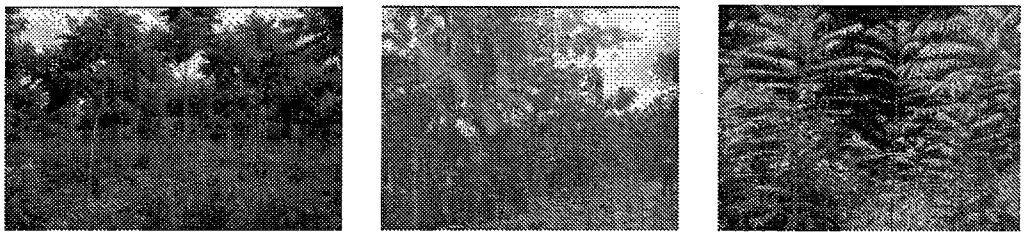
(a) (b) (c) (d)

Picture 27. Maintenance of demonstration plots of 4 species *Fagara rhetsa* (a), *Wrightia pubescens* (b), *Manilkara kauki* (c), and *Alstonia scholaris* (d)

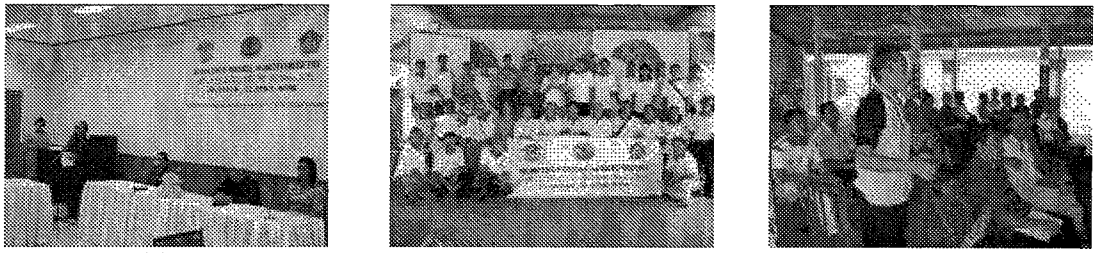
Output 7. Developed agroforestry model socialized and applied



Picture 28. Existing agroforestry model in Bali



Picture 29. Bali indigenous species-based agroforestry model



(a) (b) (c)

Picture 30. Workshop on agroforestry model (a), socialized of agroforestry model to farmers (b), (c)

(a) (b) (c)

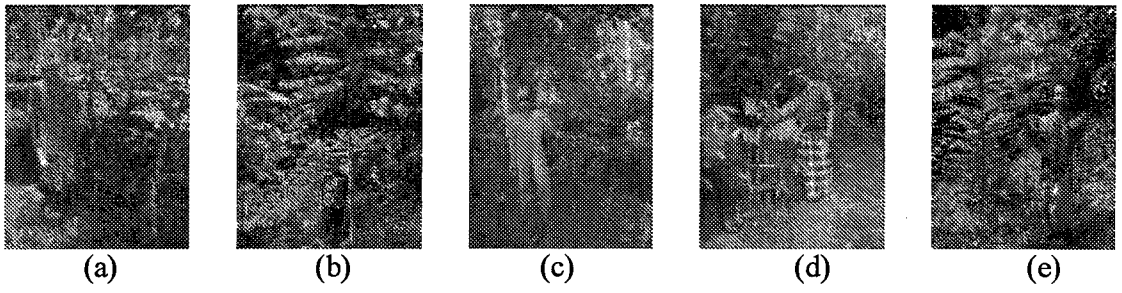
Picture 31. Training for farmer leaders and in-country study tour; study I in Yogyakarta (a); study II in Banyuwangi, East Java (b); study III in Magelang, Central Java (c)

(a) (b) (c)

(d) (e) (f)

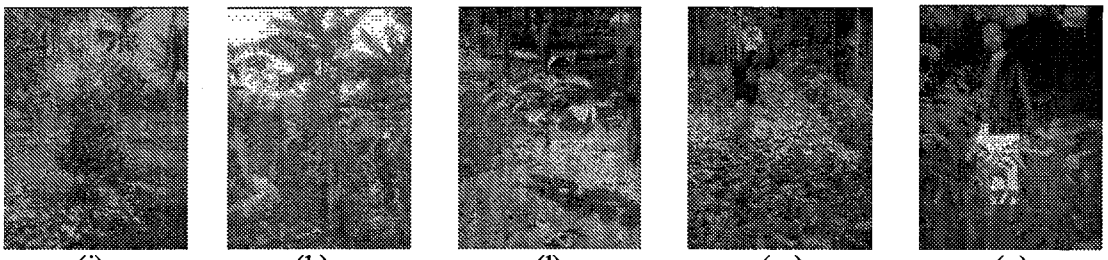
(g) (h) (i)

Picture 32. Local meeting with farmer groups in 6 Districts across Bali



(a) (b) (c) (d) (e)

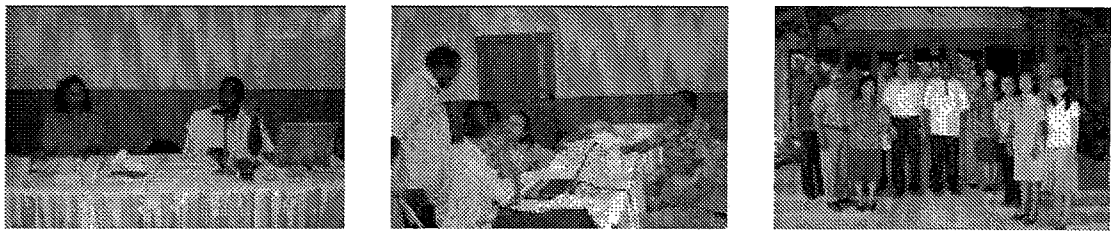
(f) (g) (h) (i)



(j) (k) (l) (m) (n)

Picture 33. Sites of planting by farmer groups in various conditions and species

Output 8. Monitoring system developed and applied

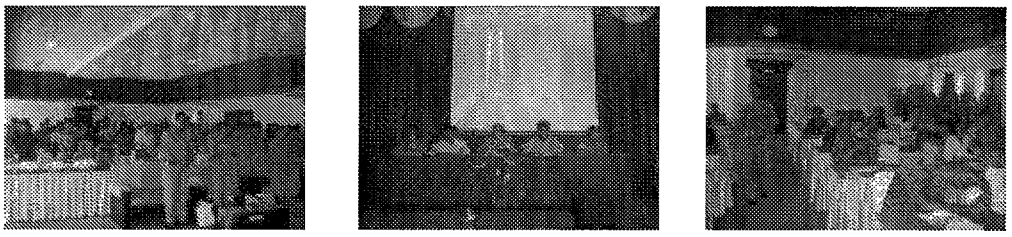


(a) (b) (c)

Picture 34. Formulation of monitoring and evaluation system

Picture 35. Project monitoring and evaluation through Project Steering Committee meeting

Activity of project extension



Picture 36. Workshop on strengthening the institutional capacity of farmer groups

Picture 37. National workshop on dissemination of project outputs and outcomes

Visitors to project nursery

(a) (b) (c)

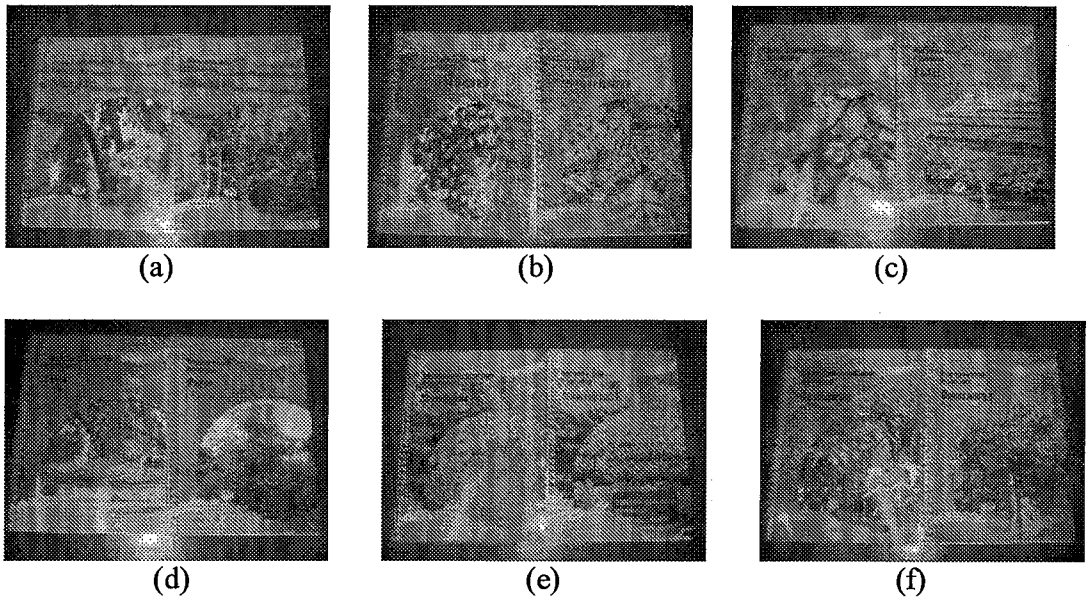
Picture 38. Ministry of Forestry of Republic of Indonesia and Ministry of Agronomy of Finland (a), (b); Secretary General of Land Rehabilitation and Social Forestry, MoF (c)

Picture 39. Governor and Parliaments of Bali Province

Picture 40. ITTO workshop on sustainable reforestation management

Picture 41. ITTO Project team from Sabah, Malaysia

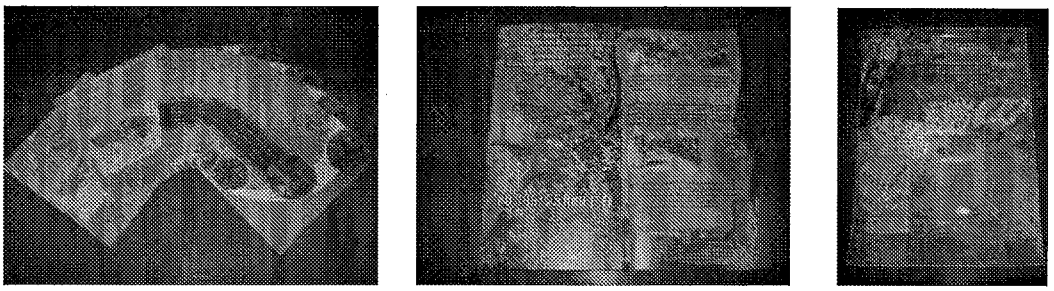
Appendix 2. Publications of the Project



(a) (b) (c)

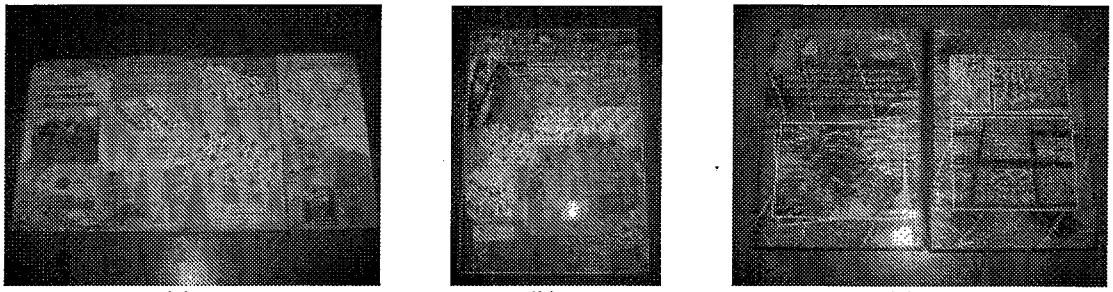
(d) (e) (f)

Picture 42. Guidelines of seed collection and handling; nursery and planting for 6 species; *Dysoxylum densiflorum* (a), *Fagara rhetsa* (b), *Planchonia valida* (c), *Alstonia scholaris* (d), *Manilkara kauki* (e), and *Wrightia pubescens* (f)



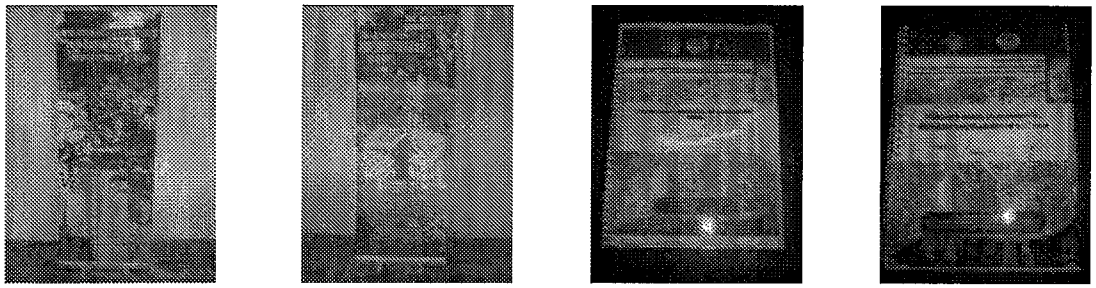
(a) (b) (c)

Picture 43. Leaflet of ITTO Project in Bali in English (a), (b) ; Poster of agroforestry model in Bahasa (c)



(a) (b) (c)

Picture 44. Leaflet of agroforestry model in English and Bahasa (a); Poster of agroforestry model in English (b); DVD of the project (c)



(a) (b) (c) (d)

Picture 45. Stand poster of Indigenous Tree Species for Sustainable Handicraft in Bali (a); Stand poster of Agroforestry Model (b); proceedings workshop on agroforestry model (c); and Guidelines of agroforestry model (d)

Printed maps

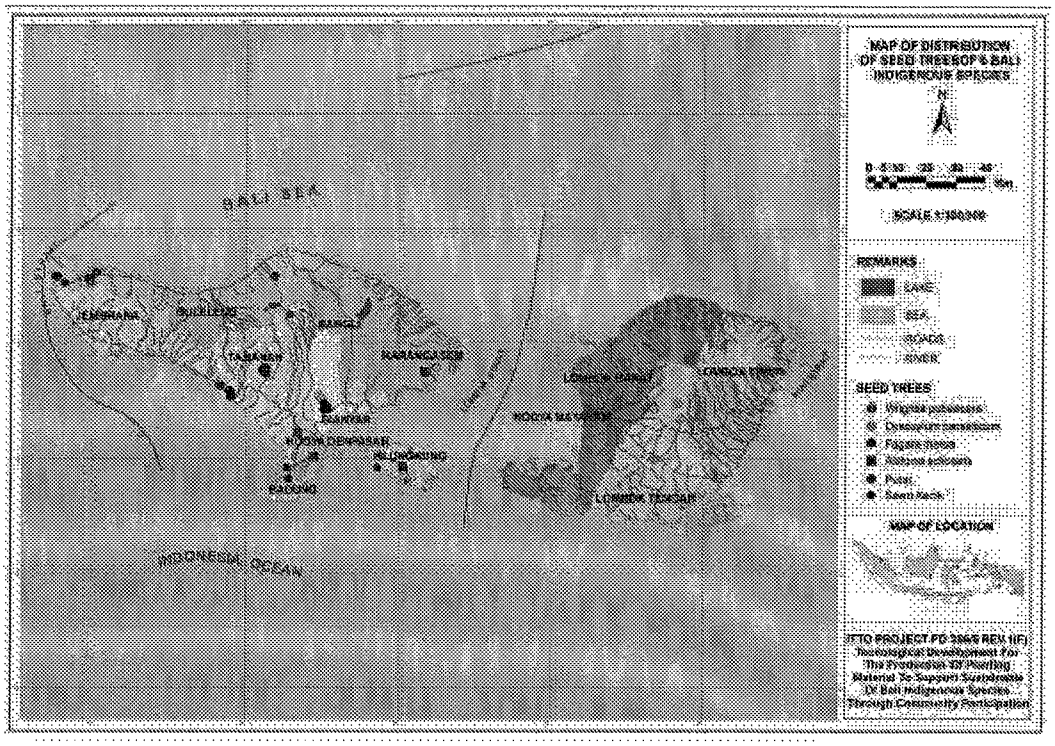


Figure 1. Map of distribution of seed trees of 6 Bali indigenous species in Bali and Lombok islands

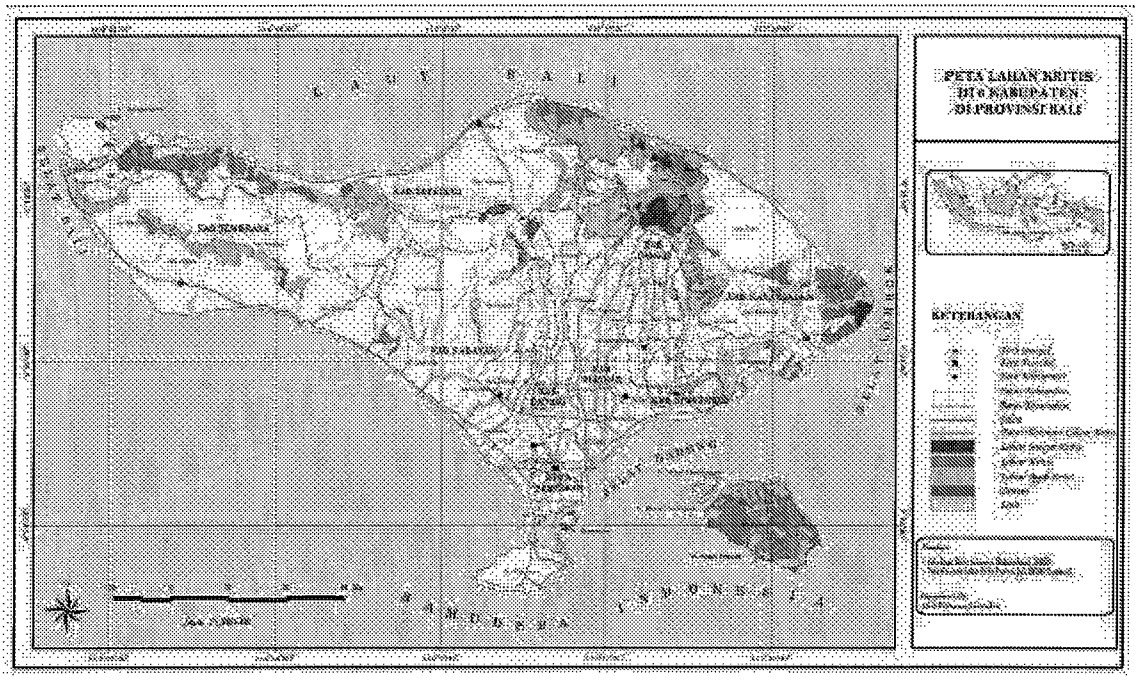


Figure 2. Map of critical land in 6 Districts across Bali

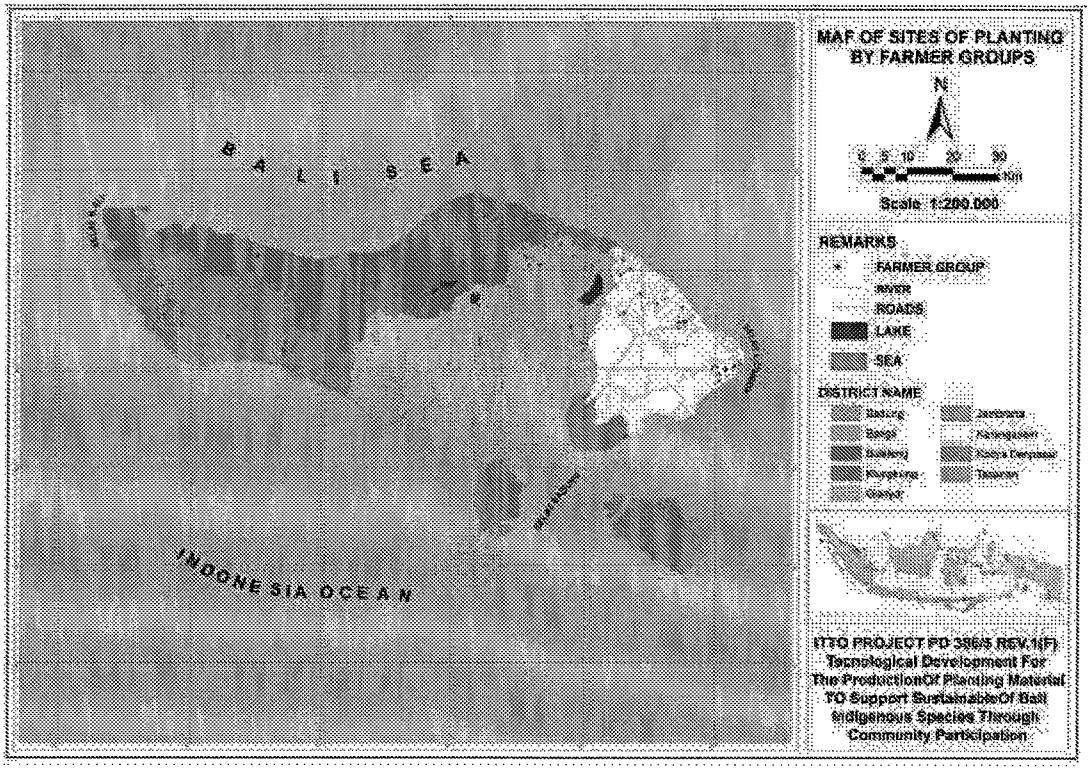


Figure 3. Map of sites of planting by farmer groups in 6 Districts across Bali

Appendix 3. List of Project Technical Report

Activity 1.1	Identification seed source and seed collection for six selected indigenous species
Activity 1.2	Further development of propagation techniques for the selected species
Activity 1.3	Comparative study on propagation techniques to Queensland, Australia
Activity 1.4	Field trial of the genetic materials and site manipulation, 6 Ha
Activity 2.1	Establishment of seed orchard for 3 species (*Alstonia scholaris*, *Planchonia valida*, *Dysoxylum densiflorum*), 6 Ha
Activity 2.2	Maintenance and assessment of seed orchard for 6 species
Activity 4.1	Data collection and analysis of social economic and biophysics
Activity 5.2	Distribution of planting materials to participating communities
Activity 6.2	Establishment and measurement of permanent sample plots
Activity 6.3	Establishment of demonstration plot of 2 species (*Planchonia valida* and *Dysoxylum densiflorum*, 20 Ha
Activity 6.4	Maintenance of demonstration plots of 4 species (*Fagara rhetsa*, *Manilkara kauki*, *Alstonia scholaris*, and *Wrightia pubescens*), 150 Ha
Activity 7.4.3	Consultation with local communities
Activity 7.4.4	Organize training for farmer leaders and in-country study tour