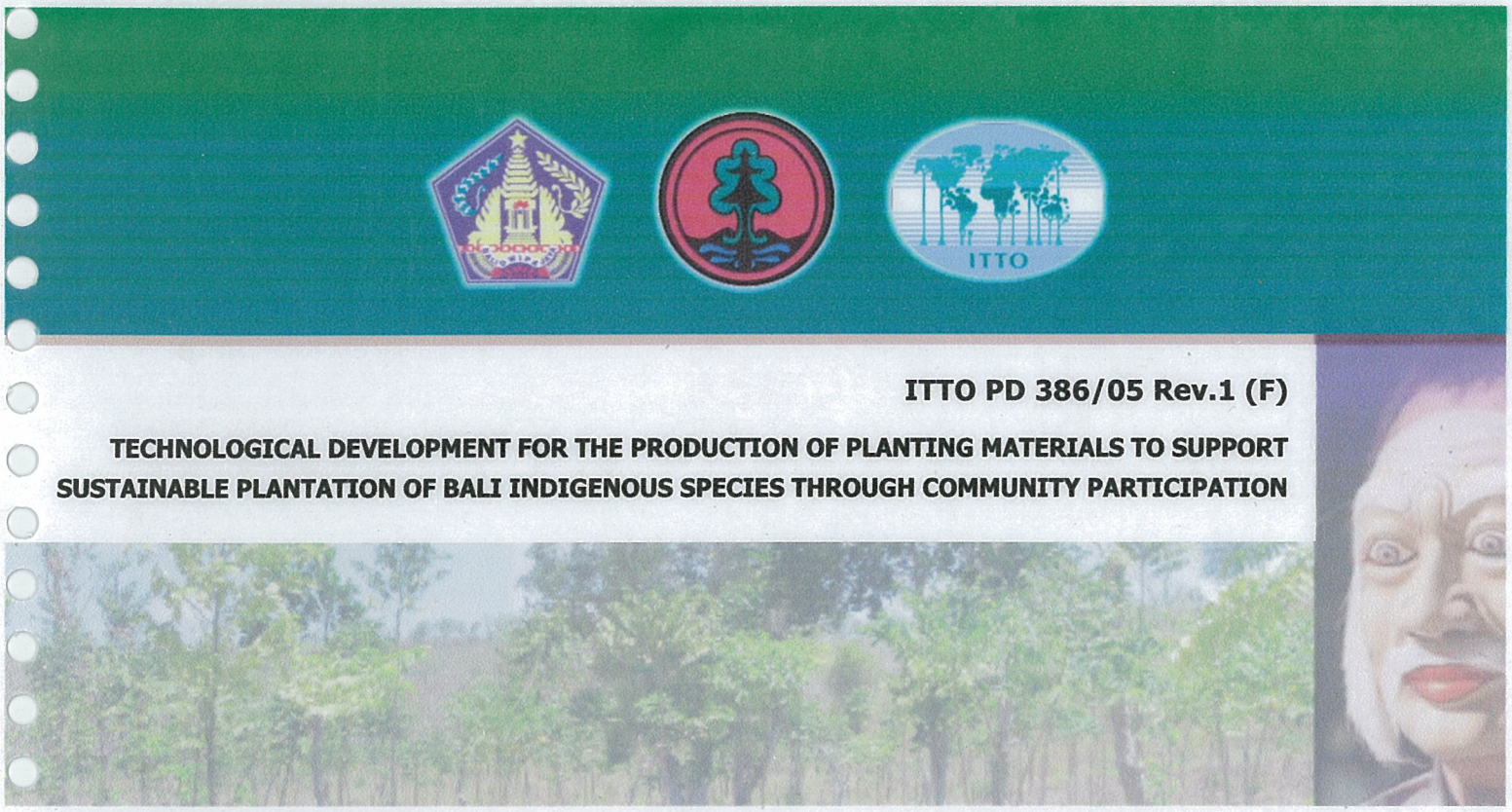
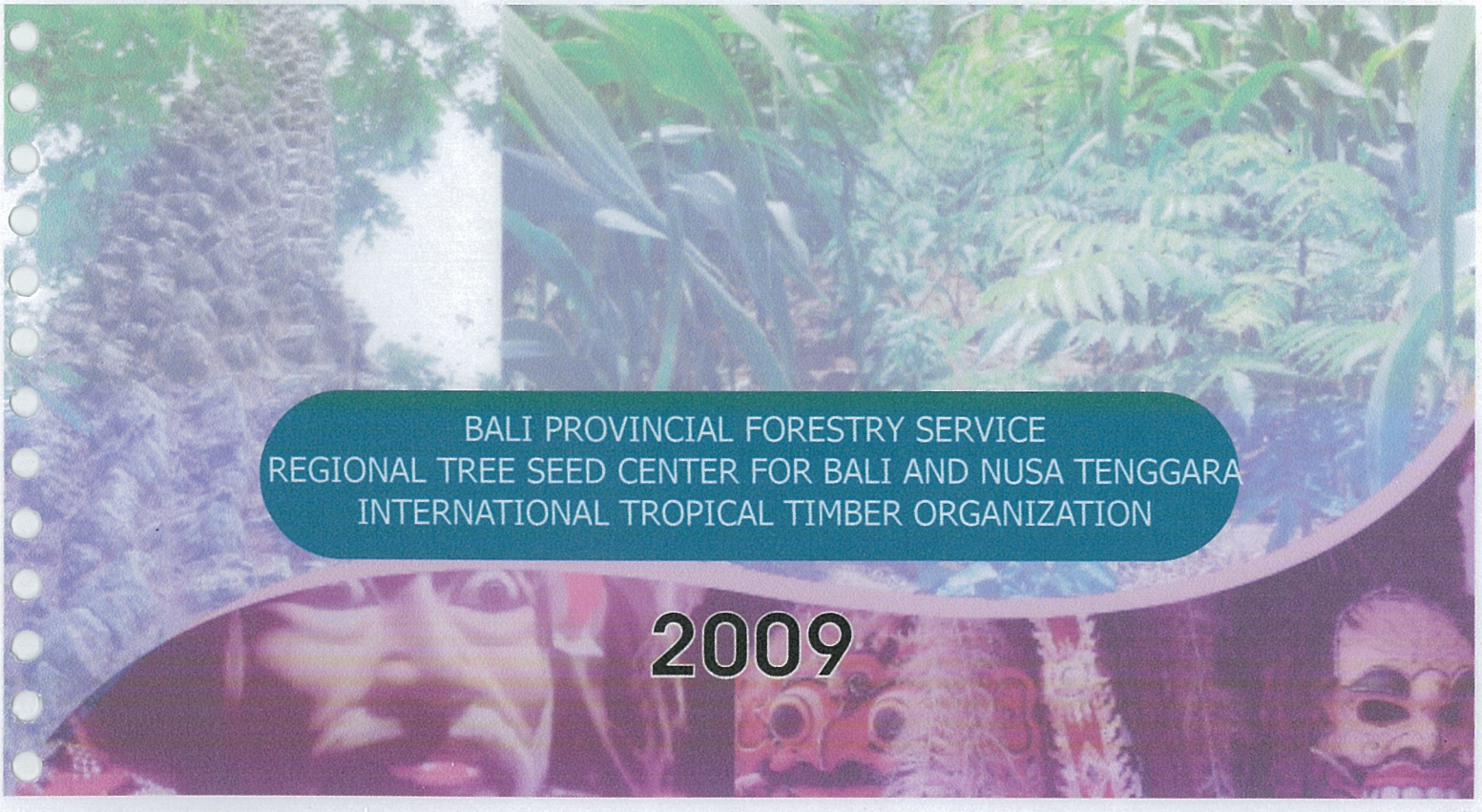


ITTO PD 386/05 Rev.1 (F)

TECHNOLOGICAL DEVELOPMENT FOR THE PRODUCTION OF PLANTING MATERIALS TO SUPPORT SUSTAINABLE PLANTATION OF BALI INDIGENOUS SPECIES THROUGH COMMUNITY PARTICIPATION

REPORTING ACTIVITY 5.2 DISTRIBUTION OF PLANTING MATERIALS TO PARTICIPATING COMMUNITIES

PREPARED BY:
PROJECT EXECUTING TEAM



BALI PROVINCIAL FORESTRY SERVICE
REGIONAL TREE SEED CENTER FOR BALI AND NUSA TENGGARA
INTERNATIONAL TROPICAL TIMBER ORGANIZATION

2009

Reporting
Activity 5.2 Distribution of planting materials to participating communities

Project Executing Team ITTO PD 386/05 Rev.1(F)

Bali Provincial Forestry Service and
Regional Tree Seed Center for Bali and Nusa Tenggara and
International Tropical Timber Organization
2009

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SUMMARY

In order to support the sustainability of wooden handicraft and carving industry that considerably increasing in the future, it is expected that a sufficient supply of wood should be available in Bali. On the other hand, the production of local wood is estimated to decrease.

The ITTO in collaboration with the Government of Indonesia and Bali Province have undertaken a tree planting program called Sustainability Development of Bali Indigenous Species since year 2003. Six local species have been selected for this program, namely: Panggal Buaya (*Fagara rhetsa*), Sawo Kecik (*Manilkara kauki*), Pulai (*Alstonia scholaris*), Bentawas (*Wrightia pubescens*), Majegau (*Dysoxylum densiflorum*), and Putat (*Planchonia valida*).

The project has been produced more than a million seedlings of these six local species. The seedlings were distributed and planted on the community private land. There were 66 farmer groups and some NGO within 6 districts namely Tabanan, Jembrana, Buleleng, Karangasem, Klungkung, and Bangli involved in this program.

The road access from main road to nursery and also capacities of project nursery have been upgraded in order to support in producing the good quality seedlings of six indigenous species. The location of the project nursery is in Village of Pejarakan, Sub-District of Grokgak, District of Buleleng.

1. INTRODUCTION

Over 55.000 ha of land in Bali are classified as degraded and critical. Rehabilitation of this land therefore is urgently needed. The production of good quality planting materials and the involvement of local farmers will help ensure the successful establishment of the plantation. To support production of good seedlings, it's important to prepare the good facilities of nursery as well as good accessibility to the nursery.

Total of 1,100,000 seedlings of 6 species (*Fagara rhetsa, Dysoxylum densiflorum, Manilkara kauki, Alstonia scholaris, Planchonia valida*, and *Wrightia pubescens*) should be produced during the project period. Those planting materials would be distributed to participating communities in 6 Districts, namely, Bangli, Buleleng, Jembrana, Karangasem, Klungkung, and Tabanan District.

Administration and documentation system is taking a part to establish good nursery. The computerized nursery accounting system is needed to apply in order to facilitate the project or related institution for monitoring and evaluation the nursery.

2. MAIN TEXT

This activity comprises of 4 sub-activities namely upgrading road access to the nursery, upgrading nursery capacities, provision planting materials 1,100,000 within 3 years, and distribution of the planting materials.

2.1 Upgrading road access to the nursery

Road access from main road to the nursery of 1.65 km length has been upgraded with gravelled surface and 5 m wide with drainage of 1 m wide and 40 cm deep on both sides.

Road work consisting of cleaning the location , prepare road base, fill out of stone (sizes 20-25 cm) and clay then compressed 5 times by stoomwales, afterwards fill out of gravel sizes 2/3 and compressed 3 times until reached optimal compaction. Figure 1 show implementation of upgrading road access to the nursery.

Figure 1. Implementation of upgrading road access to the nursery

2.2. Upgrading nursery capacities

Upgrading nursery capacities that have been conducted consisting making shaded area of 400 m2 from 200 m2 targeted, open area of 800 m2 from 600 m2 targeted as stipulated in Project Document, media processing area of 25 m2, and office area of 36 m2. Detail work of the activities each is as follows:

a. Shaded area of 400 m2:
   - Nursery beds of 1x 5 m (to fit approx 870 polybags) made of "bataco press"
   - The surface of the beds is covered by "koral" (stone in very small size) and compacted with sands to sustain surface running water
   - The whole nursery beds are covered with paranet of 80% light
   - The paranet is supported by iron pipe of 2.5" diameter and height of 2.5 m
   - PVC pipes of 0.75" diameter for irrigation

Figure 2. The activity of making shaded area

b. Open area of 800 m2:
   - Nursery beds of 1x 5 m (to fit approx 870 polybags) made of "batako press"
   - The surface of the beds is covered by "koral" and compacted with sands to sustain surface running water
   - PVC pipes ("paralon") of 0.75" diameter for irrigation

Figure 3. Implementation of building open area

In year 2008, due to reached total amount of the seedlings targeted, the project built additional nursery beds made of bamboo as 457 beds (to fit approx 400 m2).


Figure 4. Additional nursery beds made of bamboo

c. Media processing area of 25 m2:
   - Foundation using river stones and concrete frame of 15 cm x 20 cm with 1:4 cement to sands
   - The pole is to be constructed using "koral" and cement
   - Roof is corrugated asbestos
   - The floor made from mixture of cement and sands

Figure 5. The media processing area of nursery

d. Office area of 36 m2:
   - Foundation using river stones and concrete frame of 15 cm x 20 cm with 1:4 cement to sands
   - The wall is to be constructed using bricks and plastered with 1:4 cement to sands
   - Wooden frame and structure is made of tropical timber
   - Roof is "genteng" (traditional roof made from dried clay)
   - Ceramic floor quality I

Figure 6. The office and kitchen of nursery

2.3 Provision planting materials

While upgraded nursery capacities, the project also worked for provision planting materials consisting collecting the seeds, sowing the seeds in germination beds, fulfil polybag with potting media till maintenance of the planting materials. Detail phase of provision planting materials are as follows:

Seed Sowing

The seed is sown in the germinating media that consist of fine sand to a depth of about 15 cm, the surface of the media is levelled off and then covered with fine sand, 1 cm thick.

Figure 7. Treatment of seed extraction before seed sowing in germination beds

(a) (b)

Figure 8. Germinating of *Wrightia pubescens* (a) and *Alstonia scholaris* (b) in germination beds

Potting Media

While waiting the seed germinates, the work that has to do is preparing potting media. The potting media consisting of a mixture of top soil and compost/manure with ratio of 8:2. The media mixed thoroughly before being filled into polybag. The potting medium is filled manually by hand into the polybag and then placed in the nursery bed.

Figure 9. The activity of fulfil the planting medium in to polybag

Pricking Out

Pricking out did when the seedling grows vertically. Pricking out should be done in the morning or late afternoon. The seedlings are pulled gently to prevent from damage and their roots are then slightly soaked into water in plastic box. A vertical hole is made in the potting media to which the seedling will be planted using bamboo

stick. The root is then placed carefully into the hole so that is not twisted. The seedlings are placed in the nursery bed under partial shade (50 % light intensity) made of nylon net / paranet.

Figure 10. The activity of planting the seedlings in to polybags

Maintenance

Maintenance of seedling that has been conducted includes weed control, pest and diseases control and watering. Watering is regularly done 2 times a day. The project made pipes channel from spring to nursery as long as 2 km as water source to watering the seedlings. Afterwards, the frequency of watering was reduced during hardening off phase.

Figure 11. Maintenance of nursery; watering and weeding

Pest and disease control are conducted when pest and disease attacked the seedlings. The pest that attacked seedling in nursery was caterpillars, leeches, grasshoppers. While the kind of disease that occurred in nursery was *keriting daun (*kinky of leaf) and *cacar daun* (smallpox of leaf).

Around 2 months of age the shade was opened as the seedlings of the species grow better under full sun light.

In general, seedlings of the species are ready to be planted in the field at about 5-12 months old, having a height of 35-40 cm and root collar diameter of more than 4 mm.

Figure 12. The shade of the seedlings was opened in order to have full sun light

The amount of the seedlings of 6 species that have been produced in year 2006, 2007, 2008, and 2009 are shown in table below respectively.

Table 1. The seedlings that have been produced in year 2006

NO	SPECIES	Number of seedlings per month				SUB TOTAL
		Sept	Oct	Nov	Dec	
1	*Wrightia pubescens*		43.550	47.905		91.455
2	*Dysoxylum densiflorum*	18.350				18.350
						-
3	*Fagara rhetsa*					-
4	*Alstonia scholaris*	14.807				14.807
						-
5	*Planchonia valida*					-
6	*Manilkara kauki*	16.652				16.652
	SUB TOTAL	49.809	43.550	47.905	-	**141.264**

In year 2006, the project have not been produced the seedlings of *Fagara rhetsa* and *Planchonia valida* due to lack of fruiting of those species.

Table 2. The seedlings of 6 species that have been produced in year 2007

NO	SPECIES	Number of seedlings that produced per month												SUB TOTAL
		Jan	Feb	Mar	Apr	May	Jun	Jul	August	Sept	Oct	Nov	Dec	
1	*Wrightia pubescens*										49.440	36.960		86.400
2	*Dysoxylum densiflorum*		40.000	29.131										69.131
3	*Fagara rhetsa*					12.194	12.194	8.710	13.065	8.710	18.350		6.600	79.823
4	*Alstonia scholaris*													-
5	*Planchonia valida*				22.815									-
6	*Manilkara kauki*													22.815
										1.440	14.520	5.940		21.900
	SUB TOTAL	-	40.000	29.131	22.815	12.194	12.194	8.710	13.065	10.150	82.310	42.900	6.600	**280.069**

Table 3. The seedlings of 6 species that have been produced in year 2008

NO	SPECIES	The number of seedlings that produced per month												SUB TOTAL
		Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec	
1	*Wrightia pubescens*									56.615	13.065	24.388	271	94.339
2	*Dysoxylum densiflorum*		8.580	50.820	6.600								3.013	69.013
3	*Fagara rhetsa*	15.840				9.900	142.179	29.192	854	30.485	20.904	15.678	2.200	267.232
4	*Alstonia scholaris*				1.948	10.560	7.444						88.100	108.052
5	*Planchonia valida*												12.923	12.923
6	*Manilkara kauki*							36.160	92.802	2.613			2.480	134.055
	SUB TOTAL	15.840	8.580	50.820	8.548	20.460	149.623	65.352	93.656	89.713	33.969	40.066	108.987	**685.614**

Table 4. The seedlings of 6 species that have been produced in year 2009

NO	SPECIES	The number of seedlings that produced per month				SUB TOTAL
		Jan	Feb	Mar	Apr	
1	*Wrightia pubescens*					-
2	*Dysoxylum densiflorum*		2.613	1.742		4.355
3	*Fagara rhetsa*	4.355	4.355	10.000		18.710
						-
4	*Alstonia scholaris*					-
5	*Planchonia valida*	50.921	91.455	6.097		148.473
						-
6	*Manilkara kauki*					-
	SUB TOTAL	55.276	98.423	17.839	-	**171.538**

The production of seedlings of 6 species was booming in year 2008. All of species could be produced in that year due to too much of fruiting special for *F.rhetsa* and *M.kauki*. In according to that mater, the project added nursery beds with number of 457 beds and workers to maintenance the seedlings.

The total number of seedlings of six species that produced per year is as shown in Table 5 below.

Table 5. Total number of seedlings of six species that produced per year

NO	SPECIES	2006	2007	2008	2009	TOTAL
1.	*Wrightia pubescens*	91.455	86.400	94.339		272.194
2.	*Dysoxylum densiflorum*	18.350	69.131	69.013	4.355	160.849
3.	*Fagara rhetsa*	-	79.823	267.232	18.710	365.765
4.	*Alstonia scholaris*	14.807	-	108.052		122.859
5.	*Planchonia valida*		22.815	12.923	148.473	184.211
6.	*Manilkara kauki*	16.652	21.900	134.055		172.607
	TOTAL	**141.264**	**280.069**	**685.614**	**171.538**	**1.278.485**

2.4 Distribution of the planting materials

Distribution of the planting materials was implemented after the seedlings in project nursery have enough size that is more than 30 cm in height, more than 4 mm in root collar diameter and variation in number of leaves (for detail see guidelines on Seed Handling and Planting by Dr. Eko B.Hardiyanto). The important mater in distribution is that activity has to conduct during rainy season and also seedlings transportation should be carried out carefully as the young seedlings are delicate and prone to damage.

The system that applied in distribution of the planting materials is sub-contract. The company that is CV Harapan Jaya which hired by the project have to prepare truck and workers while the project was monitoring during implementation of that activity.

Figure 13. One of the trucks of CV. Harapan Jaya

Figure 14. The activity of loading the seedlings in to the truck

In order to distribute the seedlings to the location of the farmer groups properly, the project have mechanism i.e. contacted the farmer leader to inform the schedule of

distribution and asking the farmers to provide temporary space for keeping the seedlings. The seedlings would be distributed to the farmer groups after they ready to receive the seedlings. In accordance to assure that the seedlings distribution could be implemented as planned, the project have been conducted meeting for all related farmer leaders, called "Socialization of Seedlings Distribution Mechanism".

During the project period the total number of 1,175,000 seedlings of six species i.e. Panggal Buaya (*Fagara rhetsa*), Sawo Kecik (*Manilkara kauki*), Bentawas (*Wrightia pubescens*), Pulai (*Alstonia scholaris*), Putat (*Planchonia valida*) , and Majegau (*Dysoxylum densiflorum*) have been distributed to 66 farmer groups involved and the other parties that dispersed in 6 Districts across Bali. Detail of the seedlings distribution as shown in Table 6.

The seedlings also distributed to the other parties such as University, Senior High School, NGO, and religion organization in order to improve the environmental conditions of Bali. This is being in accordance with development objective of the project.

Figure 15. Unloading the seedlings and put in temporary place in farmer group before planting by farmers

Table 6. The number of seedlings distributed to participating communities

NO	DISTRICT	SUB-DISTRICT	VILLAGE		NAME OF FARMER GROUP	SPECIES						
						D. densiflorum	*F. rhetsa*	*A. scholaris*	*P. valida*	*M. kauki*	*W. pubescens*	TOTAL
FARMER GROUPS												
1.	Jembrana	Melaya	Ekasari	Ekasari	Wana Trisad Anggalasari	9000	12500	500		3000	2500	27500
2.		Mendoyo	Yehembang Kangin		Pengempon Pura Rambut Siwi	1300	3000			500	4000	8800
3.		Mendoyo	Yehembang Kangin		Banu Amertha	2000	6000			4000	6000	18000
4.		Negara	Kaliakah	Munduk	Wana Karya		4000				5000	9000
5.		Negara	Dangin Tukadaya	Munduk Kemoning	SA Danu Merta	2000	7000		1500	3500	6000	20000
6.		Negara	Kaliakah	Pangkung Lip Lip	SA Pangkung Lip Lip	4000	11250	1000	1850	1250	3100	22450
7.		Negara	Berangbang	Munduk Kendung	SA Bukit Sari	1200	7000				6000	14200
8.		Mendoyo	Poh Santen	Rangdu	SA Pala Werdi	1500	9000		5000	6000	10000	31500
9.		Melaya	Tukadaya	Pangkung Jajang	SA Santhi Pala	1500	14150	500		1250	2600	20000
10.		Melaya	Tukadaya	Sombang	SA Bina Karya		8000	1000		4000	2000	15000
11.		Melaya	Tukadaya	Sari Kuning	SA Giri Sari	1500	13000		8000	5500	5000	33000
12.		Melaya	Tukadaya	Berawantangi Taman	SA Silakrama	1500	5500	1000	5500	3500	4000	21000
13.		Melaya	Tukadaya	Pangkung Jajang	Sa Udiana Sari	1500	9500	1000	5500	1500	2000	21000

NO	DISTRICT	SUB-DISTRICT	VILLAGE		NAME OF FARMER GROUP	SPECIES						
						D. densiflorum	*F. rhetsa*	*A. scholaris*	*P. valida*	*M. kauki*	*W. pubescens*	TOTAL
FARMER GROUPS												
14.		Melaya	Tukadaya	Sari Kuning	SA Sarikarya	1500	9500		4000	2500	2000	19500
15.		Mendoyo	Yeh Sumbul	Pangkuang Languan	SA Mekar Sari		1000			1000	4000	6000
	Sub Total					**28,500**	**120,400**	**5,000**	**31,250**	**37,500**	**64,200**	**286,950**
												0
1.	Bangli	Tembuku	Yang Api	Tingas	KT Purwanadi	4000	1000	750	1250	500	4000	11500
2.		Kintamani	Belandingan	Belandingan	Tunggal Sari	4000	3000	500	1500	1000	4000	14000
3.		Kintamani	Kutuh	Angansari	Angansari	2000	7000		1500	500	3000	14000
4.		Kintamani	Kutuh	Kutuh	Munduk Taman Sari		4700			3000	4300	12000
5.		Tembuku	Yang Api	Bukti	Bukti Nadi	2000	6000		1000		3000	12000
6.		Tembuku	Yang Api		Wana Sari	2500	4000	500		3000	4000	14000
7.		Kintamani	Satra	Kembangsari	SA Kerta Yasa	4000	3500	1500		1000	3000	13000
8.		Kintamani	Satra	Tanah Gambir	SA Gambir Sari	3500	8500	200	4500	4000	9500	30200
9.		Kintamani	Satra	Batu Palah	SA Giri Merta Nadi	4000	5500	1500		3500	5500	20000
10.		Kintamani	Subaya	Munduk Tupada	SA Tupada	3500	4000			3000		10500
11.		Kintamani	Subaya	Yeh Tangga	SA Yeh Tangga	2000	500	500		500	500	4000
12.		Kintamani	Bantang		SA Bangun Budi Karya	5000	3500		3000	4500	9000	25000
13.		Kintamani	Siakin		KT Mertasari		1000			1000	4000	6000
14.		Bangli	Pengotan	Delod Desa	KT Rimba Lestari	1000	4500		2000	2000	5500	15000
	Sub-Total					**37,500**	**56,700**	**5,450**	**14,750**	**27,500**	**59,300**	**201,200**
												0

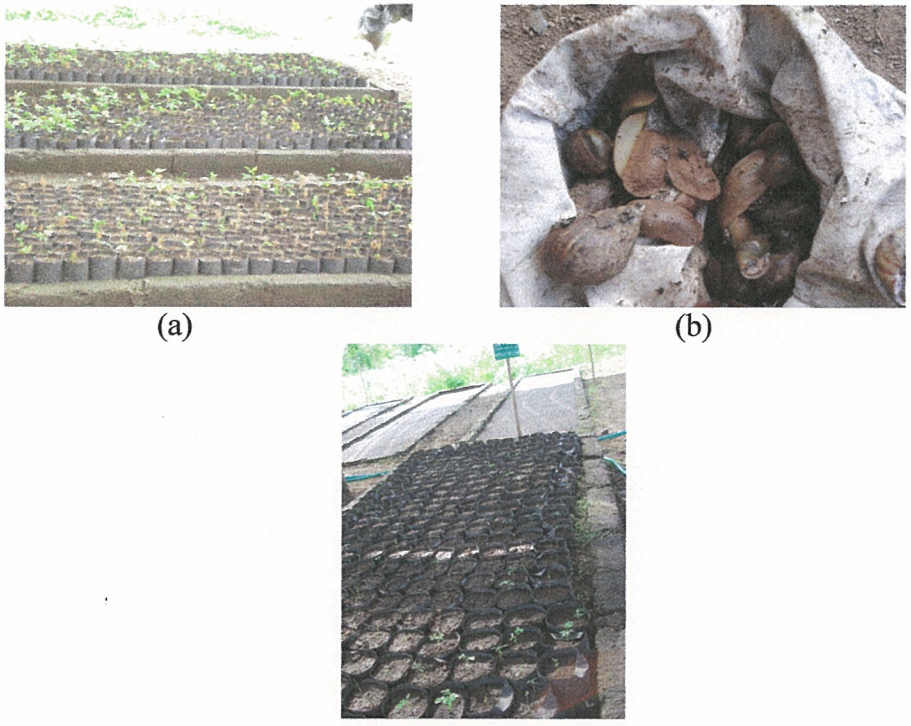
NO	DISTRICT	SUB-DISTRICT	VILLAGE		NAME OF FARMER GROUP	SPECIES						
						D. densiflorum	*F. rhetsa*	*A. scholaris*	*P. valida*	*M. kauki*	*W. pubescens*	TOTAL
FARMER GROUPS												
1.	Karangasem	Kubu	Tulamben	Karangsari	Gunung Agung	4000	6000	3000		2500	8750	24250
2.		Kubu	Tulamben	Muntig	Pulasari	1500	5000			2500	5500	14500
3.		Karangasem	Bukit	Bukit Tabuhan	Hutan Rakyat Serbaguna	2000	5000			3500	1000	11500
4.		Karangasem	Bukit	Jumenang	Lempuyang Luhur	2000	4000		1500	4000	1000	12500
5.		Karangasem	Seraya	Delod Sema	Bina Sejahtera	2000	7000		1500	7000	2000	19500
6.		Karangasem	Seraya	Taman	Taman sari	1500	5000		1500	3500	1500	13000
7.		Karangasem	Seraya Tengah	Kecog Balung	Wisnu Murti		5500	500		3000	6000	15000
8.		Kubu	Tianyar Tengah	Moncol	Tri Hita Yoga		6000			5000	7000	18000
9.		Karangasem	Seraya Tengah	Peninggaran	SA Suka Mekar	500	2000			4000		6500
10.		Kubu	Juntal Kaja	Mondet	SA Suka Karya	500	8000			3000		11500
11.		Karangasem	Seraya Timur	Tinja Alas	Batu Megok	500	4500	1500		3000	3000	12500
12.		Karangasem	Seraya Timur	Bukit Catu	Batu Kunyit	500	4500	500		6000	1000	12500
13.		Karangasem	Seraya Timur	Tanah Barak	Pangkuh Lestari	500	3500	500		5000	4000	13500
14.		Kubu	Tulamben	Tulamben Tengah	KT Tulamben Tengah		7000			4500	6000	17500
15.		Kubu	Ban		Pertiwi Palasari		1500				4500	6000
16.		Kubu	Ban	Daya	KT Daya	2000	5000			3000	1000	11000
17.		Kubu	Ban	Bonyoh	Tunas Mekar	2000	5000			4000		11000
18.		Kubu	Tulamben	Muntig	Gunung Sari		7000			2000	3000	12000
19.		Kubu	Tianyar	Dalem	KT Dalem		4500	500	1500	3500	3000	13000

NO	DISTRICT	SUB-DISTRICT	VILLAGE		NAME OF FARMER GROUP	SPECIES						
						D. densiflorum	*F. rhetsa*	*A. scholaris*	*P. valida*	*M. kauki*	*W. pubescens*	TOTAL
FARMER GROUPS												
			Tengah									
20.		Kubu	Ban	Ban	KT Cegi		3000				13000	16000
21.		Kubu	Baturingit	Bantas	KT Mekar Sari		3000			4000	4000	11000
	Sub-Total					**19,500**	**102,000**	**6,500**	**6,000**	**73,000**	**75,250**	**282,250**
												0
1.	Klungkung	Dawan	Pesinggahan Kangin	Bukit Tengah	Bina Lestari	300	200		500	1500	3000	5500
2.		Dawan	Besan	Bukit Abah	Darma Sentana		750			1000	3000	4750
3.		Dawan	Dawan Klod		Pura Dalem	400	450		100	275	350	1575
	Sub-Total					**700**	**1,400**		**600**	**2,775**	**6,350**	**11,825**
												0
1.	Buleleng	Grokgak	Musi	Munduk Musi	Giri Wana Lestari	2000	7000		650	3750	500	13900
2.		Grokgak	Penyabangan	Munduk Gondol	Wana Giri Lestari	2500	3500					6000
3.		Tejakula	Julah	Kanginan	Suung Maisi		7000		5000	500	5500	18000
4.		Kubu Tambahan	Bulian	Lod Guwuh	SA Amertha Sari		6000			2000	4500	12500
5.		Kubu Tambahan	Bulian	Lod Guwuh	SA Yeh Basang		6000			5000		11000
	Sub-Total					**4,500**	**29,500**		**5,650**	**11,250**	**10,500**	**61,400**
												0

NO	DISTRICT	SUB-DISTRICT	VILLAGE		NAME OF FARMER GROUP	SPECIES						
						D. densiflorum	*F. rhetsa*	*A. scholaris*	*P. valida*	*M. kauki*	*W. pubescens*	TOTAL
FARMER GROUPS												
1.	Tabanan	Selemadeg	Selemadeg	Selemadeg Kaja	Palasari	1000	2500	2500	500	2500	7500	16500
2.		Selemadeg	Serampingan		Tunas Mekar		4000				6000	10000
3.		Baturiti	Bangah	Bengkaling	Subak Bengkaling	2000	6000			500	2500	11000
4.		Baturiti	Batunya		Padang Ombo		6800			900	3500	11200
5.		Penebel	Mengista	Piling	SA Cita ala Werdi		2000				5000	7000
	Sub-Total					**3,000**	**21,300**	**2,500**	**500**	**3,900**	**24,500**	**55,700**
				Sub Total		**93.700**	**331.300**	**19.450**	**58.850**	**155.925**	**240.100**	**899.325**
OTHERS												
1.	Badung	Plaga	Plaga		SA Plaga (NGO)	-	-	400	50	-	100	550
2.	Buleleng				Dishutbun (Government)	-	-	-	-	25	-	25
3.	Denpasar				PHDI (NGO)	500		950		100		1550
4.	Buleleng				PT Trimbawan (NGO)	30	100		70	100		300
5.	Buleleng				SMA Grokgak (School)	30	25		25	40	60	180
6.	Buleleng			KT Wana Sari Merta	Demoplot 20 Ha	20.306			33.275			53581
7.	Buleleng			KT Bajul Jaya	Demoplot 150 Ha		18.000	48000		6075	17.000	89075
8.	Denpasar				University of Warmadewa	30			30	35	30	125

NO	DISTRICT	SUB-DISTRICT	VILLAGE		NAME OF FARMER GROUP	SPECIES						
						D. densiflorum	*F. rhetsa*	*A. scholaris*	*P. valida*	*M. kauki*	*W. pubescens*	TOTAL
FARMER GROUPS												
9.	Denpasar				Pramuka Saka Wana Bhakti (Scoot)						1.000	1000
10.	Buleleng			KT Wana Asih Jaya	Tegal Bunder			40000	80000			120000
11.	Denpasar				Dinas Kehutanan (Government)	29						29
12.	Denpasar				BPTH (Government)	3160	600	2000	2900	600		9260
				Sub-Total		**24.085**	**18.725**	**91.350**	**116.350**	**6.975**	**18.190**	**275.675**
				TOTAL		**117.785**	**350.025**	**110.800**	**175.200**	**162.900**	**258.290**	**1.175.000**

The difference number of seedlings between produced and distributed is 103,485 seedlings (app ± 8%). Those seedlings could not distribute because some died and some have bad performance due to several causes such as attacked by caterpillar, leeches and disease, and also too much water in polybags due to hard raining that occurred in January-February 2008. The interesting case of seedlings damage was attacked by leeches. This insect attacked by eaten the leaves early in the morning (around 3-5 am) and then hidden during the day. More than hundred of leeches attacking the seedlings in the same time that caused almost all of leaves in one bed of seedlings gone. They just left the stem of seedlings and especially attack the young seedlings which just pricking out from the germination bed and planting in to polybags. The leeches just found around June for attacking the nursery. To protect the nursery from attacking by leeches, the staffs of nursery spread salt on border line of bed and also catch this insect manually one by one.



(a) (b)

(c)

Figure 16. The seedlings that death because too much water (a) leeches that attacked the seedlings by eaten the leaves of seedlings (b) and (c).

3. CLOSING

Upgrading road access from main road to the nursery, a distance of 1.65 km from targeted 1.20 km, is being carried out. The capacities of nursery have been upgraded consist of shaded area of 400 m2 from targeted 200m2; open area of 1,200 m2 from targeted 600 m2; media processing area of 25 m2; and office of 36 m.

The seedlings with total amount of 1,278,485 seedlings have been produced by the project from targeted 1,100,000 seedlings comprising *M. kauki* 172,607 seedlings, *D. densiflorum* 160,849 seedlings, *A. scholaris* 122,859 seedlings, *W. pubescens* 272,194 seedlings, *P. valida* 184,211 seedlings and *F. rhetsa* 365,765 seedlings.

The total number of 1,175,000 seedlings of six species has been distributed to participating communities that spread in 6 Districts across Bali, namely, Tabanan, Jembrana, Buleleng, Bangli, Karangasem, and Klungkung. The seedlings that distributed during the project period comprising *D. densiflorum* 117,785 seedlings, *A. scholaris* 110,800 seedlings, *W. pubescens* 258,290 seedlings, *P. valida* 175,200 seedlings, *F. rhetsa* 350,025 seedlings, and *M.kauki* 162,900 seedlings. The communities that received the seedlings were 66 groups of farmer, education institution, and NGO.