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MOREFORESTs

Management of Resources on Forestlands through
Enhanced Sustainable Technologies

Version 1.0

ANNEX 4: Detailed costing of Agroforestry and Plantation Models

EnRD CBFM REFO GUIDELINES (Version 2012 Feb 17)

Forest Rehabilitation Model 1: Multi-purpose Tree Plantation

Sites	Denuded sites and brushland (deforested before 2003), coherent area of at least 5 ha, production forest not more than 2 km away from next road
Silviculture	A range of tree species planted at 3 m x 3 m. Species choice according to micro-site conditions and farmers preference
Objectives	Wood production and soil & water conservation
Species	Dipterocarps and other indigenous species, mahogany, gmelina etc.

Operation		Labor	Material subsidy		
		Total P	Type	Quantity/ha.	Total (P/ha.)
Brushing	Strips 1 m wide every 3 m				
Staking	1,110 stakes/ha				
Pit digging	Pits 30 x 30 x 30 cm				
Seedling hauling	1,110 seedlings/ha				
Planting	containerized seedlings		various	1,110	8,936
Beating-up	20% replanting, incl. hauling, planting		various	222	
Tending	7 times in 3 yrs spot weeding				
Protection	1 guard/100ha/3 yrs				
Totals		16,000			9,000

Notes

Labour rate	For calculation purpose the DENR rate of PHP 170/day (as of MC 2000-19) was used
Spacing/seedlings	Figures in the table are based on an average seedling cost of 7 Peso. Costs include a 5% allowance for seedling numbers and 10% transport allowance (rounded).
Choice of species	According to technical considerations and farmer preferences. At least two species with a minimum of 30% of the second species shall be planted per sub-compartment.
Area limitations	min. 5 ha, max. 20 ha per compartment
Protection	Guard also clears and controls fire breaks

Subsidy Payment Schedule for Model 1 Rainforest Plantation

	Total PhP/ha	1 st Inst'ment PhP/ha	2 nd Inst'ment PhP/ha	3 rd Inst'ment PhP/ha
Labor cost <i>(lumpsum per ha, upon passing M&E)</i>	16,000	0	8,000 50%	8,000 50%
Material cost <i>(against receipts, up to maximum budget per ha)</i>	9,000	9,000 upon liquidation	0 0%	0 0%
Total cost	25,000	9,000	8,000	8,000
KfW/GTZ subsidy up to 80%	20,000	9,000	5,500	5,500
- for material ¹⁾	9,000	9,000	0	0
- for labor ²⁾	11,000	0	5,500	5,500

¹⁾ reimbursement of costs for seedlings etc up to max. 9,000 PhP/ha, including seedlings for beating-up in year 2

²⁾ provided full acceptance by M&E, possible reductions in case of lower survival rates, amounts to be passed on in full to farmer benefit

The partner LGU/PO shall receive an advance used as disposition fund amounting to 15% of the overall grant subsidy for NRM. At least 80% of the disposition fund has to be spent and liquidated before requesting replenishment

Payment Criteria

1st instalment (material)	Payment for seedlings, upon delivery, inspection and acceptance of seedlings by DENR staff or TA consultants, evidence of compartment map and implementation arrangements (sub-agreements with farmers)
2nd instalment (labor subsidy)	Three months after planting, upon M&E check by designated DENR staff, including GPS check of actually planted area, minimum number of 1,000 established plants/ha corresponding to ca. 90% survival rate, lower survival rate needs beating-up, additional seedlings can be invoiced within the budget limits
3rd instalment (labor subsidy)	Maintenance and retention, 2 years after planting, upon M&E check by designated DENR staff. If a minimum number of 890 established plants/ha corresponding to ca. 80% survival rate has been confirmed, the full bonus (retention fee) of 5,500 Peso/ha shall be paid. Lower survival rates will cause proportional deductions (e.g. at 750 effective trees $750/890 \times 5,500$ PhP = 4,635 PhP/ha)

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Forest Rehabilitation Model 2: ANR/Enrichment Planting

Sites	(1) Degraded natural forest with open canopy, or (2) mosaik of forest and open areas
Silviculture	(1) Protection and improvement of natural vegetation, enrichment with dipterocarps and mahogany <u>2 x10 m spacing</u> , or <u>planting in gaps and open areas, around 40% of area</u>
Objectives	Invaluation of degraded natural forest by supporting natural regeneration plus enrichment, wood production, biodiversity conservation
Species	Relatively fast growing dipterocarps such as white lauaan, almon, bagtikan, red lauaan, other indigenous species, and exotic species up to max. 50%

Operation	Specifications	Labor subs.	Material Subsidy		
		Total P	Type	Quantity/ha.	Total (P/ha.)
Brushing	Strip clearing 1.5 m wide every 10 m				
Staking	500 stakes/ha				
Pit digging	Pits 30 x 30 x 30 cm				
Seedling hauling	500 seedlings/ha				
Planting	containerized wildlings		various	500	
Beating-up	20% replanting, incl. hauling, planting		various	100	
Tending	7 times in 3 yrs strip weeding				
Protection	1 guard/100ha/3 yrs				
Totals		8,500			6,500

Notes

Labour rate	For calculation purpose the DENR rate of PHP 170/day (as of MC 2000-19) was used
Strip clearing	Includes cutting or girdling of competitor trees, natural regeneration of dipterocarps and other commercial species shall be maintained
Spacing/seedlings	Figures in the table are based on an average of 70% hardened dipterocarp wildlings at 12 Peso and 30% other seedlings at 5 Peso. Costs include a 10% allowance for seedling numbers and transport (rounded).
Choice of species	According to technical considerations and farmer preferences. At least two species with a minimum of 30% of the second species shall be planted per compartment. Mahogany must not account for more than 30%
Area limitations	min. 5 ha, max. 20 ha per compartment

Subsidy Payment Schedule for Model 2 ANR/Enrichment Planting

	Total PhP/ha	1 st Inst'ment PhP/ha	2 nd Inst'ment PhP/ha	3 rd Inst'ment PhP/ha
Labor cost in PhP (lumpsum per ha, upon passing M&E)	8,500	0	4,250 50%	4,250 50%
Material cost in PhP (against receipts, up to maximum budget per ha)	6,500	6,500 upon liquidation	0 0%	0 0%
Total cost	15,000	6,500	4,250	4,250
KfW/GTZ subsidy up to 80%	12,000	6,500	2,750	2,750
- for material ¹⁾	6,500	6,500	0	0
- for labor ²⁾	5,500	0	2,750	2,750

¹⁾ reimbursement of costs for seedlings etc up to max. 6,500 PhP/ha, including seedlings for beating-up in year 2

²⁾ provided full acceptance by M&E, possible reductions in case of lower survival rates, amounts to be passed on in full to farmer beneficial

The partner LGU/PO shall receive an advance used as disposition fund amounting to 15% of the overall grant sub- sidy for NRM. At least 80% of the disposition fund has to be spent and liquidated before requesting replenishment

Payment Criteria

1st instalment	Payment for seedlings, upon delivery, inspection and acceptance of seedlings by DENR staff or TA consultants, evidence of compartment map and implementation arrangements (sub-agreements with farmers)
2nd instalment	Three months after planting, upon M&E check by designated DENR staff, including GPS check of actually planted area, minimum number of 450 established plants/ha corresponding to ca. 90% survival rate, up to 20% can be eligible natural regeneration, lower survival rate needs beating-up, additional seedlings can be invoiced within the budget limits
3rd instalment	Maintenance and retention, 2 years after planting, upon M&E check by designated DENR staff. If a minimum number of 400 established plants/ha corresponding to ca. 80% survival rate has been confirmed, the full bonus (retention fee) of 2,750 Peso/ha shall be paid. Lower survival rates will cause proportional deductions (e.g. at 300 effective trees 300/400 x 2,750 PhP = 2,063 PhP/ha)

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Forest Rehabilitation Model 3: Rattan Enrichment Planting

Sites	Open natural forest (20%-60% crown cover) and plantations with rotation > 20 yrs In natural forest planting every 2 m in rows 5 m apart, making use of natural gaps, in plantations (not with gmelina or other short rotation species) plant close to planted trees and harvest together with tree crop
Silviculture	
Objectives	Rattan production and invaluation of degraded natural forest, biodiversity conservation
Species	Palasan and other high-value rattan species

Operation	Specifications	Labor subs.	Material subsidy		
		Total P	Type	Quantity/ha.	Total (P/ha.)
Site preparation	Strip clearing 1 m wide every 5 m				
Staking	1,000 stakes/ha				
Pit digging	Pits 20 x 20 x 20 cm				
Seedling hauling	1,000 seedlings/ha				
Planting	containerized wildlings		various	1,000	
Beating-up	20% replanting		various	200	
Tending	7 times in 3 yrs strip weeding				
Protection	1 guard/100ha/3 yrs				
Totals		8,500			6,500

Notes

Labour rate	For calculation purpose the DENR rate of PHP 170/day (as of MC 2000-19) was used
Spacing/seedlings	Figures in the table are based on collected wildlings hardended and potted in nursery at 5 Peso. Costs include a 10% allowance for seedling numbers and transport (rounded).
Choice of species	Locally available wildlings of Palasan or other high-value rattan species
Area limitations	min. 5 ha, max. 20 ha per compartment

Subsidy Payment Schedule for Model 3 Rattan Enrichment Planting

	Total PhP/ha	1 st Inst'ment PhP/ha	2 nd Inst'ment PhP/ha	3 rd Inst'ment PhP/ha
Labor cost in PhP (lumpsum per ha, upon passing M&E)	8,500	0	4,250 50%	4,250 50%
Material cost in PhP (against receipts, up to maximum budget per ha)	6,500	6,500 upon liquidation	0 0%	0 0%
Total cost	15,000	6,500	4,250	4,250
KfW/GTZ subsidy up to 80%	12,000	6,500	2,750	2,750
- for material ¹⁾	6,500	6,500	0	0
- for labor ²⁾	5,500	0	2,750	2,750

¹⁾ reimbursement of costs for seedlings etc up to max. 6,500 PhP/ha, including seedlings for beating-up in year 2

²⁾ provided full acceptance by M&E, possible reductions in case of lower survival rates, amounts to be passed on in full to farmer benefit

The partner LGU/PO shall receive an advance used as disposition fund amounting to 15% of the overall grant sub- sidy for NRM. At least 80% of the disposition fund has to be spent and liquidated before requesting replenishment

Payment Criteria

1st instalment	Payment for seedlings, upon delivery, inspection and acceptance of seedlings by DENR staff or TA consultants, evidence of compartment map and implementation arrangements (sub-agreements with farmers)
2nd instalment	Three months after planting, upon M&E check by designated DENR staff, including GPS check of actually planted area, minimum number of 450 established plants/ha corresponding to ca. 90% survival rate, up to 20% can be eligible natural regeneration, lower survival rate needs beating-up, additional seedlings can be invoiced within the budget limits
3rd instalment	Maintenance and retention, 2 years after planting, upon M&E check by designated DENR staff. If a minimum number of 400 established plants/ha corresponding to ca. 80% survival rate has been confirmed, the full bonus (retention fee) of 2,750 Peso/ha shall be paid. Lower survival rates will cause proportional deductions (e.g. at 300 effective plants 300/400 x 2,750 PhP = 2,063 PhP/ha)

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Forest Rehabilitation Model 4: Mangrove Reforestation

Sites	Lagoons, coves and bays, mud / sandflats not directly exposed to high waves
Silviculture	A range of mangrove species planted at 2 m x 2 m. Species choice according to micro-site conditions
Objectives	Coastal protection, biodiversity conservation, spawning and nursery ground for marine animals and
Species	Rhizophora, Avicennia, Sonneratia and other middle/landward species

Operation	Specifications	Material subsidy			
		Labor subs. Total P	Type	Quantity/ha.	Total (P/ha.)
Site preparation	coastal debris removal				
Staking	2,500 stakes/ha		bamboo	2,500	
Planting	Propagules (partially potted)		various	2,500	
Beating-up	20% replanting		various	500	
Tending	removal of algae, vernacles, trash etc				
Protection	1 guard/100ha/3 yrs				
Totals		9,500			8,500

Notes

Labour rate For calculation purpose the DENR rate of PHP 170/day (as of MC 2000-19) was used.

Full plantation / enrichment The number of plants per ha refer to full plantation. In case an open stand of mangroves shall be enriched, all inputs and costs per ha shall be reduced by 50%

Seedlings Rhizophora. apiculata, R. micronata, R. stylosa, Avicennia, Sonneratia. If possible propagules shall be directly planted. Under difficult conditions (areas exposed to the sea) and for sensitive species, propagules potted and hardened in nurseries shall be used for better survival. Figures in the table are based on 70% direct planting of propagules and 30% potted propagules, assumed to be produced by the beneficiaries

Choice of species According to technical considerations and site characteristics. At least two species with a minimum of 30% of the second species shall be planted per sub-compartment.

Area limitations min. 3 ha, max. 20 ha per compartment

Subsidy Payment Schedule for Model 4 Mangrove Reforestation

	Total PhP/ha	1 st Inst'ment PhP/ha	2 nd Inst'ment PhP/ha	3 rd Inst'ment PhP/ha
Labor cost in PhP <i>(lumpsum per ha, upon passing M&E)</i>	9,500	0	4,750	4,750
		0%	50%	50%
Material cost in PhP <i>(against receipts, up to maximum budget per ha)</i>	8,500	8,500	0	0
		upon liquidation	0%	0%
Total cost	18,000	8,500	4,750	4,750
KfW/GTZ subsidy up to 80%	14,400	8,500	2,950	2,950
- for material ¹⁾	8,500	8,500	0	0
- for labor ²⁾	5,900	0	2,950	2,950

¹⁾ reimbursement of costs for seedlings etc up to max. 8,500 PhP/ha, including seedlings for beating-up in year 2

²⁾ provided full acceptance by M&E, possible reductions in case of lower survival rates, amounts to be passed on in full to farmer beneficia

The partner LGU/PO shall receive an advance used as disposition fund amounting to 15% of the overall grant sub- sidy for NRM. At least 80% of the disposition fund has to be spent and liquidated before requesting replenishment

Payment Criteria

1st instalment	Payment for seedlings and bamboo sticks, immediately after planting and M&E check by designated DENR staff (including GPS check of actually planted area), evidence of compartment map and implementation arrangements (sub-agreements with farmers)
2nd instalment	Three months after planting, upon M&E check by designated DENR staff, minimum number of 2,000 established plants/ha corresponding to ca. 80% survival rate, lower survival rate needs beating-up, additional seedlings can be invoiced within the budget limits
3rd instalment	Maintenance and retention, 2 years after planting, upon M&E check by designated DENR staff. If a minimum number of 1,750 established plants/ha corresponding to ca. 70% survival rate has been confirmed, the full bonus (retention fee) of 2,950 Peso/ha shall be paid. Lower survival rates will cause proportional deductions (e.g. at 1,500 effective plants $1,500/1,750 \times 2,950$ PhP = 2,603 PhP/ha)

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Forest Rehabilitation Model 5: Agroforestry/Multi-Storey Fruit Orchard

Sites	Upland sites used for planting annual crops or sugar cane, soil depth at least 30 cm
Planting	Mixture of fruit trees (8 x 8 m), bananas, coffee/cacao shrubs and vegetables
Objectives	Increasing income from sustainable agroforestry production. Farmer will provide additional suckers and seedlings from the sale of bananas and other products
Species	Bananas, rambutan, lanzones, mangoes, guayobano, jackfruit, durian, coconuts, coffee, cacao, abaca, rubber etc, vegetables

Operation	Specifications	Labor subs.	Material subsidy		
		Total P	Type	Quantity/ha.	Total (P/ha.)
Site preparation	Brushing, clearing,				
Hole digging, planting, mulching	Fruit trees + bananas 30 x 30 x 30 cm, mulching conserves soil moisture in the dry season and controls weeds		Fruit tree seedlings, bananas, coconuts, coffee, cacao etc	As many as available for 14,000 PhP, at least 280	
Tending	Starter pack for the first year fertilizing (total 200 g/tree) and weeding 4 x/yr		Fertilizer kg w/transport	55	
Pest control (contingency)			Pesticide lit	1	
Totals		8,000			14,000

Notes: This model is intended as alternative to unsustainable annual cropping in sloping uplands

Choice of species Select according to climate type, micro-site conditions and local market. Farmers can select a variety of fruit trees etc. up to the maximum amount of 14,000 PhP/ha, with focus on grafted high-yielding fruit trees, high quality coffee and cacao seedlings

Spacing/seedlings Fruit trees 8 x 8 to 10 x 10 depending on species, interplanted with bananas, coffee, cacao etc

Fertilizer Complete fertilizer application for each young tree and banana sucker 0.2 kg/first year

Area limitations 1.0 ha per household. Should be in conjunction with other project revegetation categories.

Subsidy Payment Schedule for Model 5 Multi-storey Fruit Orchard

	Total PhP/ha	1 st Inst'ment PhP/ha	2 nd Inst'ment PhP/ha	3 rd Inst'ment PhP/ha
Labor cost in PhP (lumpsum per ha, upon passing M&E)	8,000	0 0%	4,000 50%	4,000 50%
Material cost in PhP (up to max. budget per ha, min. 280 permanent agroforestry plants)	14,000	14,000 upon liquidation	0 0%	0 0%
Total cost in PhP	22,000	14,000	4,000	4,000
KfW/GTZ subsidy up to 80%	17,600	14,000	1,800	1,800
- for material ¹⁾	14,000	14,000	0	0
- for labor ²⁾	3,600	0	1,800	1,800

¹⁾ reimbursement of costs for seedlings etc up to max. 14,000 PhP/ha, including seedlings for beating-up in year 2

²⁾ provided full acceptance by M&E, possible reductions in case of lower survival rates, amounts to be passed on in full to farmer benefit

The partner LGU/PO shall receive an advance used as disposition fund amounting to 15% of the overall grant subsidy for NRM. At least 80% of the disposition fund has to be spent and liquidated before requesting replenishment

Payment Criteria

1st instalment	Payment for fruit tree seedlings, banana suckers, vegetable seeds and an initial amount of fertilizer, upon delivery, inspection and acceptance of seedlings by DENR staff or TA consultants and signed delivery receipts by farmers, evidence of compartment map and implementation arrangements (sub-agreements with farmers).
2nd instalment	Three months after planting, upon M&E check by designated DENR staff, including GPS check of actually planted area, minimum number of planted fruit trees, bananas is 280 per ha, lower survival rate needs beating-up, additional seedlings can be invoiced within the budget limits
3rd instalment	Maintenance and retention, 2 years after planting, upon M&E check by designated DENR staff. If a minimum survival rate of 80% for planted trees etc. has been confirmed (min. 224 plants/ha), the full bonus (retention fee) of 1,800 Peso/ha shall be paid. Lower survival rates will cause deductions.