No.

Ministry of Agriculture and Rural Development
The Socialist Republic of Vietnam

IMPLEMENTATION REVIEW STUDY REPORT
ON
THE AFFORESTATION PROJECTON SANDY AREA
IN
THE SOCIALIST REPUBLIC OF VIETNAM

June 2008

JAPAN INTERNATIONAL COOPERATION AGENCY

KOKUSAI KOGYO CO., LTD.

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PREFACE

In response to a request from the Government of the Socialist Republic of Vietnam, the Government of Japan decided to conduct a basic design study on the Afforestation Project on Sandy Area and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Vietnam a review study team from February 20 to March 29, 2008.

The team held discussions with the officials concerned of the Government of Vietnam, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Vietnam in order to discuss a review of the basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Socialist Republic of Vietnam for their close cooperation extended to the teams.

June, 2008

MASAHUMI KUROKI
Vice-President
Japan International Cooperation Agency

June 2008

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Implementation Review Study on the Afforestation Project on Sandy Area in the Socialist Republic of Vietnam.

This review study was conducted by Kokusai Kogyo Co., Ltd., under a contract to JICA, during the period from February 2008 to June 2008. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Vietnam and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

HIDETO YAMAZAKI
Project Manager,
Implementation review study team on
the Afforestation Project on Sandy Area
KOKUSAI KOGYO CO., LTD.

SUMMARY

1 Overview of the Country

The Socialist Republic of Vietnam (hereinafter referred to as "Vietnam") has a national land area of 332,000 km^2 of which approximately two-thirds consists of mountain and hilly areas. As of 2007, the total population is 85.30 million, most of which (73%) live in agricultural, fishing or mountain villages. Those engaged in agriculture, forestry or fisheries account for 57% of the total working population in various industries in the said year.

Since the adoption of the Doi Moi Policy, Vietnam has been pushing economic reform through a shift toward a market economy and the macro economy of Vietnam has been achieving certain positive results in terms of the continuance of a high economic growth rate, containment of inflation and job security. However, from the viewpoint of microscopic economic and fiscal management relating to the reform of state enterprises and reform of the administrative structure and government finance, the national economy still significantly relies on state enterprises.

The socioeconomic development strategy is renewed every 10 years in Vietnam and a five year national development plan is formulated to implement the strategy. The current Eighth Five Year National Development Plan (2006–2010) aims at Vietnam breaking away from the category of a developing country through sustainable economic development, while continually upholding the Doi Moi Policy adopted in 1986. Special emphasis is placed on the reform of the economic structure, improvement of the labor composition, modernization of industries, promotion of science and technology and achievement of high quality education. At the same time, the achievement of poverty reduction is sought to establish a culturally rich and safe society in order to provide a secure social environment for the people. Concerning government finance, tax and oil-related revenue is the main revenue but the expenditure far exceeds the revenue, resulting in an annual deficit of some VND 300 billion.

Vietnam is attracting much world attention as a promising country for foreign aid. It has become a pilot country for the Comprehensive Development Framework (CDF) advocated by the World Bank and has been actively attempting to achieve institutional improvement, capacity building and improved aid effects through active participation in policy dialog and joint work with donors utilizing the partnership and other frameworks. Vietnam prepared the Comprehensive Poverty Reduction and Growth Strategy (CPRGS) as a Poverty Reduction Strategy Paper (PRSP) based on the CDF in May 2005 and was the first country in Asia to do so. This CPRGS has been integrated in the Eighth Five Year National Development Plan (2006–2010) which determines the basic policies of Vietnam. This means that two

policies which used to exist in parallel have been unified to promote economic growth and poverty reduction simultaneously.

Since 1992, Japan has been providing full-scale aid for Vietnam and has been the top donor since 1995. Japan has adopted a stance of assisting the development of Vietnam notably from the viewpoint of a mutually dependent economic relationship but also from the humanitarian as well as social viewpoints and has identified three priority areas, i.e. the promotion of growth, livelihood and social improvement and institutional development.

2 Background, History and Outline of the Requested Japanese Assistance

While Vietnam was once endowed with abundant forest resources, the forest area was substantially reduced due to the long war, urbanization and other reasons; now forest area per capita is the lowest in the Asian counties. In the face of such a situation, the Government of Vietnam was to implement the National Five Million Hectare Reforestation Program (5MHRP) aimed at the reforestation of 14.3 million ha by 2010. Although active efforts are being made in terms of forest conservation and planting, the creation of 100,000 ha of coastal protection forests is said to be urgently required.

Vietnam has a long coastline stretching from north to south and the coast in the southern central part of the country is lined with a series of sandy areas. Agricultural crops and infrastructure facilities are damaged by strong winds and shifting sand caused by typhoons and monsoons, severely affecting the lives of local residents. To improve the situation, the Government of Vietnam made a request for Japanese assistance for the afforestation/reforestation of these coastal sandy areas and this request resulted in the commencement of "the Project for Afforestation on the Coastal Sandy Area in Southern Central Viet Nam (PACSA)", a grant aid project of the Government of Japan. Under PACSA, 3,652.88 ha (actual planted area of 3,167.11 ha) of coastal protection forests were created in Quang Nam Province and Phu Yen Province before its completed in April, 2005.

The Government of Vietnam has since been promoting the creation of coastal protection forests using PACSA as the model. However, as no planting has been conducted at difficult planting sites, such as wind erosion sites and shifting sand sites, many difficult planting sites remain in the southern central part of Vietnam where damage by strong winds and shifting sand still frequently occurs due to the lack of coastal protection forests.

In view of the historical background described above, the Government of Vietnam has made a new request to the Government of Japan, which is to assist the creation of 9,480 ha of coastal protection forests in Quang Nam Province, Quang Ngai Province, Binh Dinh Province and Khanh Hoa Province.

Because of the high level of technical difficulty of planting to respond to this request, the determination of an appropriate scope of cooperation by means of checking the requested sites, necessary planting techniques and implementation system was essential. For this reason, a preparatory study was conducted in the period from December 2005 to February 2006. As a result of this preparatory study, it was decided to conduct a basic design study featuring 5,200 ha of coastal areas in the four provinces to check the necessity, relevance and urgency of the requested project in detail.

In the basic design study, studies are conducted and discussions were held with Vietnamese side on items such as confirmation of plantation boundaries, plantation techniques to be introduced, confirmation on management system, responsibilities, procurement of equipments.

The study team and the Vietnamese side came to conclusion after the study that the project sites will be the coastal areas in three Provinces, such as Quang Nam Province, Quang Ngai Province, and Binh Dinh Province, the total area of 2,598.47 ha. Over-rapped areas with other land use plans (the Vietnamese side waived Khanh Hoa Province) and unsuitable areas for planting are excluded as the result of the study.

During the last visit of the Basic Design study team, the team found that portion of PACSA plantation area in Quang Nam province was cleared for titanium mining purpose, without reporting it to the Japanese side. It also became conspicuous that there are plans such as “transmigration zone” and “economic development zone” over-lapping with the coastal area of Quang Nam province. The Japanese side had decided to postpone implementation of a new grant aid on this matter and had requested a regret and presentation of recovery scheme, together with confirmation of avoidance with other development plans from the Vietnamese side, to resume the plantation project assisted by the Japanese.

Upon the request from the Japanese side, Ministry of Agriculture and Rural Development (MARD) manifested a plan of plantation of the same size with the cleared PACSA area. MARD also explained that development plans in coastal area of Quang Nam province are in preliminary stage of the scheme; and it promised that MARD would hold discussion with Japanese side prior to the development if cutting of trees would be necessary, and will pay attention for avoidance of over-rapping of the development plans with the new plantation sites of the Japanese grant aid project.

With the proposal and explanations made by the Vietnamese side, the Japanese government has conducted a project implementation study. During the implementation review study, it was confirmed that the replanted trees by the Vietnamese side, whose area and the function of them were found to be the equivalent to the cleared trees of PACSA in Quang Nam province.

Meanwhile, 5MHRP is considered to be a priority Program of the Ten Year Socioeconomic Development Strategy (2001 – 2010) which is the medium to long-term development policy of Vietnam, the Eighth Five Year National Development Program (2006 – 2010) and the Forest Development Strategy 2001 – 2010 (the revised Forest Development Strategy (draft) 2006 – 2020 is currently being debated) which is based on the above strategy and Program. Coordinated aid is being provided for 5MHRP as well as the Forest Development Strategy 2001 – 2010, the higher program of 5MHRP, by the partnership group for the Forest Sector Support Program and Partnership (FSSP). The request project does not, therefore, overlap with the aid projects of other donors and will directly contribute to 5MHRP as a complementary project to other projects.

The Eighth Five Year National Development Program (2006 – 2010) states that 5MHRP is integrated to the Hunger Eradication and Poverty Reduction Programmes (HEPR) implemented by MARD to promote agriculture and rural development as part of reviews to increase the efficiency of 5MHRP.

3 Outline of the Study Results and Project Components

Under the circumstances described above, the Government of Japan decided to conduct an implementation review study for "the Afforestation Project on Sandy Area (APSA)" and entrusted the Japan International Cooperation Agency (JICA) to conduct this study. Accordingly, JICA sent the Implementation Review Study Team to Vietnam for the period from February 20 to March 29, 2008. The Study Team conducted a field survey at the requested sites and held a series of discussions with officials of the Government of Vietnam. On its return to Japan, the Study Team conducted the work to prepare the Implementation Review Study report. JICA then sent a mission to Vietnam to explain the contents of this draft report for the period from May 19 to May 30, 2007 and agreement was reached with the Vietnamese side. The present report has been finalized through the process mentioned above.

The activities under the basic design study included surveys and discussions on the finalization of the target planting sites, types of planting techniques to be introduced, confirmation of the maintenance system, scope of responsibility against latent defects, procurement of general-purpose equipment, etc. In the course of the implementation review study, some of the requested sites (those in Binh Dinh Province) were withdrawn because of their overlapping with other development projects in Vietnam and unsuitable sites for planting were excluded from the scope of the Japanese assistance. Consequently, the finalized target area for afforestation is 1,009.97 ha of coastal areas in two provinces: Quang Nam Province and Quang Ngai Province.

The outline of the Project is described in Table-1.

Table-1 Outline of Project

Overall Goal :	Creation of coastal protection forests in coastal areas in Vietnam using the Project as a model
Project Purpose :	Reduction of the damage caused by shifting sand, strong winds, sand movement, etc. to agricultural as well as fishing villages in the coastal areas of Quang Nam Province and Quang Ngai Province.
Activities :	i Construction of operation roads ii Procurement of fine seedlings iii Ancillary planting works (measures to prevent/reduce damage by shifting sand, flooding, etc.) iv Planting of fine seedlings v Tending of the planted trees vi Patrolling and guarding of the coastal protection forests, primarily by local residents vii Construction of lookout towers viii Erection of project information signboards
Outputs :	Creation of coastal protection forests to block shifting sand, strong winds, sand movement, etc. in the coastal areas of Quang Nam Province and Quang Ngai Province
Inputs :	Japanese Side Grant aid cooperation by the Government of Japan Vietnamese Side a. Required manpower b. Preparation of electric power lines and access roads c. Financial inputs relating to the maintenance and protection of newly created coastal protection forests and the operation and maintenance of the Project.

The components of the original application for Japanese assistance, results of Basic Design study, and results of Implementation Review study are compared in Table-2.

Table-2 Changes of Project Component

Component			Requested Items and the Volume	Results of Basic Design	**Results of Implementation Review**	Remarks
Project Sites	Compartment Area	Total	9,480 ha	2,598.47 ha	**1,009.97 ha**	1)
		Quang Nam Province	800 ha	594.82 ha	**595.48 ha**	
		Quang Ngai Province	1,400 ha	414.06 ha	**414.49 ha**	
		Binh Dinh Province	5,280 ha	1,589.59 ha	**0.00 ha**	1)
		Khanh Hoa Province	2,000 ha	0.00 ha	**0.00 ha**	
	Planting Area of the Above	Total	9,480 ha	2,463.75 ha	**892.06 ha**	1), 2)
		Quang Nam Province	800 ha	570.52 ha	**482.81 ha**	1)
		Quang Ngai Province	1,400 ha	409.61 ha	**409.25 ha**	
		Binh Dinh Province	5,280 ha	1,483.62 ha	**0.00 ha**	1)
		Khanh Hoa Province	2,000 ha	0.00 ha	**0.00 ha**	
Major Components	Afforestation	Planting Area	9,480 ha	2,463.75 ha	**892.06 ha**	1), 2)
		Roads (Vehicle Roads)	60 km	19.8 km	**7.63 km**	
		Operation Roads (Footpaths)	0 km	15.1 km	**15.19 km**	
		Temporary Nurseries with Auxiliary Facilities	11	1	**0**	
		Lookout towers	18	4	**2**	1)
		Project Information Signboards (Large)	0	6	**4**	1)
		Project Information Signboards (Small	0	17	**7**	1)
	Equipment Procurement	4 WD Wagons	5	0	**0**	
		4 WD Pick-Up Trucks	4	0	**0**	
		Motorbikes	18	0	**0**	
		Personal Computers	14	0	**0**	
		Printers	14	0	**0**	
		Scanners	5	0	**0**	
		GIS Software	14	0	**0**	
		Digital Cameras	14	0	**0**	
		Copy Machines	14	0	**0**	

1) Changes made by exclusion of sites in Binh Dinh Province
2) Changes made by exclusion of unsuitable area in the project sites, i.e. cemetery

Each component is briefly described next. Casuarina and Acacia are the target planting species in Quang

Ngai and Quang Nam, accordingly, while Cashew and Neem will be used as supplementary species. The relationship between the characteristics of the planting sites and the planting methods is shown in Table-3.

Table-3 Quantity of Trees to be Planted

Province	Site Characteristics	Technical Difficulty	Plant Species	Density	Mixing Rate
Quang Nam	Frequently Submerged Area	Highest	Acacia *Acacia crassicarpa*	2,500 /ha, subtracted by number of existing trees	Pure Acacia forest
	Orginery sandy areas	High	Casuarina *Casuarina equisetifolia* Acacia Cashew *Anacardium occidentale* Neem *Melia azadirachta*	1,600 /ha, subtracted by number of existing trees	Mixing of: Casualina 30%, Acacia 50%, Cashew 10%, Neem 10%
Quang Ngai	Dying forest areas	High	Casuarina	1,600 /ha, subtracted by number of existing trees	Pure Casuarina forest
	Areas adjacent to the shoreline	Highest	Casuarina	2,500 /ha, subtracted by number of existing trees	Pure Casuarina forest

Planting will be conducted in an early stage in the first half of the rainy season to ensure a sufficient period of growth after planting. The planting area by province and term is shown in Table-4.

Table-4 Areas of Plantation

Province	Term-2
Quang Nam	482.81 ha
Quang Ngai	409.25 ha
Total	892.06 ha

At sites where planting is technically difficult, the following types of ancillary planting work will be conducted to reduce a fall of the survival rate due to strong winds, shifting sand and flooding (Table-5).

Table-5 Quantity of Ancillary Work

Site Characteristics	Type of Ancillary Work	Quantity (Term-2)
Area Adjacent to Shoreline	Shield Stick Work	92.49 ha
Frequently Flooded Area	Ridge Work (H=0.4m)	149.18 ha

Tending will be conducted in tandem with the planting for the purpose of reducing the death rate of the planted trees and improving the growth rate. The types of tending to be conducted under the Japanese assistance will be supplementary planting and top dressing.

Supplementary planting intends the replacement of those trees, which have died after planting. This will be conducted in early period at the beginning of the rainy season one year after initial planting. The planned supplementary planting area by province and term is shown in Table-6 based on a supplementary planting rate of 15%.

Table-6 Areas of Supplementary Planting

Province	Term-3
Quang Nam	72.42 ha
Quang Ngai	61.39 ha
Total	133.81 ha

Top dressing will be conducted one year after the initial fertilizer application at the time of planting or supplementary planting or the previous top dressing as the effects of fertilizer application and top dressing wears out for a period of three years. As the best timing for top dressing should coincide with the plant growth season, it will be conducted in the first half of the rainy season. The type of fertilizer to be used will be either organic fertilizer or manure. The top dressing area by province is shown in Table-7.

Table-7 Areas of Fertilization and Top Dressing

Province	Initial Fertilization	Top dressing for supplementary planting	Top dressing for the second year trees	Top dressing for the third year trees	Total by province
Quang Nam	482.81	482.81	482.81	482.81	1,931.24
Quang Ngai	409.25	409.25	409.25	409.25	1,637.00
Total	892.06	892.06	892.06	892.06	3,568.24

The total number of seedlings required for planting and supplementary planting is shown in Table-8.

Table-8 Number of Required Seedlings

Province	Specie	Plantation	Supplementary Planting	Total
Quang Nam	Casuarina	28,653	4,298	32,951
	Acacia	622,270	93,341	715,611
	Cashew	53,384	8,008	61,392
	Neem	53,384	8,008	61,392
	Total by province	757,691	113,655	871,346
Quang Ngai	Casuarina	556,128	83,420	636,548
	Total by province	556,128	83,420	636,548
Total	Casuarina	584,781	87,718	672,499
	Acacia	622,270	93,341	715,611
	Cashew	53,384	8,008	61,392
	Neem	53,384	8,008	61,392
	Total	1,313,819	197,075	1,510,894

All seedlings will be procured from the existing nurseries. The seedling standards by species are shown in Table-9.

Table-9 Standard of Seedlings

Species	Type	Height	Nursing Period	Minimum Pot Size
Casuarina	Sowed seedlings Rooted cuttings	60 - 100 cm	6-8 months	Ø10cm × 20cm (H)
Acacia	Sowed seedlings	25 - 45 cm	2.5-3 months	Ø4cm × 10cm (H)
Cashew	Grafts	50 - 70 cm	3 months after grafting	Ø10cm × 20cm (H)
Neem	Sowed seedlings	25 - 45 cm	4-5 months	Ø10cm × 20cm (H)

Operation roads will be constructed at the project target areas to efficiently conduct planting, tending and maintenance (as well as post-planting protection). Such roads will be either vehicle roads or footpaths depending on the shape and topographical conditions of each project site. The construction length of the operation vehicle roads is shown in Table-10.

Table-10 Length of Operation Road (Vehicle)

Province	District	Compartment	Total (km)	
			Total	Term 2
Quang Nam	Thang Binh	BM-1～3 BD-1～3 BH-1～2	7.63	7.63

Distance of planned foot-path operation road is shown in Table-11.

Table-11 Length of Operation Road (Footpath)

Province	District	Compartment	Total (km)
Quang Ngai	Duc Pho	PA-1	4.69
		PV-1	2.86
		PK-1	4.74
		PK-2	2.90
Total			15.19

Lookout towers are planned as monitoring facilities for the prevention and early detection of forest fire and the prevention of invasion by farm animals, illegal cutting and the spread of disease and insect damage at the newly created coastal protection forests. They will also function as fixed-point observation facilities for the monitoring of plant growth and as viewing platforms to increase the demonstration effect of the model forests. Two lookout towers, i.e. one in Quang Nam Province and one in Quang Ngai Province, will be constructed.

Eleven project information signboards will be erected. These will consist of four large signboards (5 m x 10m; two in each province along National Road No. 1) and seven smaller signboards (3 m x 6 m; two in Quang Nam Province, five in Quang Ngai Province) along suitable access roads.

Under the Project, it will be necessary for the Vietnamese side to conduct the work listed in Table-12.

Table-12 Works to be Conducted by Vietnamese Side

Item	Work to be Conducted by the Vietnamese Side
At the detailed design stage	i Establishment of a MB in all related organizations ii Signing of the B/A iii Issue of the A/P iv Detailed design contract (Agreement) with the Japanese consultant v based on the E/N vi Distribution of the planned forests to local residents Approval of the tender documents
Prior to the signing of the contract for the main work (Japanese assistance)	i Signing of the B/A ii Issue of the A/P iii Work supervision contract (Agreement) with the Japanese consultant based on the E/N iv Implementation of the tender v Signing of the work contract (Contract)
During the main work	
[Work in General]	
Permission and approval	i Permission and approval required for the implementation of the Japanese assistance
Maintenance	i Procurement of equipment (vehicles etc.) required for maintenance ii Patrolling and safeguarding of the planting sites, temporary facilities, permanent facilities after their handing over
Various awareness raising (educational) activities	i Preparation of pamphlets, etc. ii Meetings to explain the Project to local residents iii Forest Day events
Work supervision	i Issue of the Notice of Commencement ii Witnessing of the various inspections and issue of the certificates of completion of the work and the service
[Afforestation Work]	
Planting and tending	i Distribution of the planned forests to local residents ii Removal of obstacles at the sites iii Coordination of labor supply iv Measures to reduce feeding damage by cattle and other farm animals (coordination work) v Measures to combat disease and pests vi Measures to combat forest fires vii Measures to combat the theft of the planted trees viii Explanation of the Project to and request for the cooperation of local residents
Procurement of seedlings	i Coordination with existing nurseries and related organizations
Construction of operation roads	i Construction of access roads (construction and maintenance) * Quang Nam Province : 600 m (two sites) * Quang Ngai Province : none
Construction of lookout towers	i Maintenance of the towers after handing over
Installation of project information signboards	i Provision of land ii Maintenance of the signboards after handing over
After the completion of the main work	i Maintenance (protection) of the created coastal protection forests ii Maintenance of the constructed facilities iii Maintenance of the temporary facilities (if necessary) iv Extension of and awareness raising activities on the techniques to create coastal protection forests v Witnessing of the inspection for warranty against defects and issue of the certificate of inspection completion

4 Project Period and Estimated Project Cost

The Project is a long-term project stretching over a period of 25 years. However, the Japanese assistance will feature the first five years constituting the initial investment period. The expected length of each type of work required for the implementation of the Japanese assistance is shown in Table-13. The Japanese assistance will be classified as a Type A contract resulting in a treasury obligation.

Table-13 Time Necessary for the Project

Detailed Design	5.5 months
Tender	3.5 months
Construction and Procurement	51.0 months
Total	60.0 months

5 Relevance of the Project

With the implementation of the Project, 1,009.97 ha (actual planting area: 892.06 ha) of forests will be created in coastal sandy areas in the two target provinces, alleviating the damage to farming or fishing villages due to shifting sand, strong winds, sand movement, etc. The following indicators will be used to measure the positive effects of the Project.

Objectively Verifiable Indicators for the Outputs	More than 700 ha (approximately 80% of the total project area and 0 ha under the present situation) of coastal protection forests with a mean tree height of 1 m or more will have been created one year after (in the first rainy season) the completion of the Japanese assistance.
Objectively Verifiable Indicators for the Project Purpose	i The number (ratio) of local households damaged by strong winds will be found to have decreased in a questionnaire survey to be conducted at least five years after the completion of the Japanese assistance (at the time of the Basic Design Study, 88.0% or 161 households out of 183 households were damaged by strong wind every year). ii The number (ratio) of local households damaged by shifting sand will be found to have decreased in a questionnaire survey to be conducted at least five years after the completion of the Japanese assistance (at the time of the Basic Design Study, 59.6% or 109 households out of 183 households were damaged by shifting sand every year).

The size of the population benefiting from the Project is shown in Table-14 and the positive effects of the Project will be measured by conducting a questionnaire survey with representatives of local residents five years after the completion of the Japanese assistance.

Table-14 Number of Beneficiaries in Each Province

Residents of three Communes in Thang Binh District, Quang Nam Province	20,985
Residents of five Communes in Duc Pho District, Quang Ngai Province	37,283
Total	58,268

The pending tasks which must be tackled by the Vietnamese side to realize and preserve the project effects are described below along with recommendations regarding technical cooperation and collaboration with other donors.

- The formulation of a long-term and rational forest management plan to ensure the proper maintenance and protection of forests is necessary. Intensive discussions with the organizations concerned on appropriate forest maintenance and utilization methods, including the procedure to permit the conversion of land use from forest in certain cases in connection with other development activities, are also necessary.
- To positively contribute to 5MHRP, the higher program, the continuous implementation of projects similar to the present Project throughout Vietnam using the techniques adopted under the Project as well as those which have been modified and improved to reflect the local conditions is necessary. As the Vietnamese side will be entirely responsible for education and extension activities, sufficient capacity on the Vietnamese side to effectively conduct extension activities and to formulate plans is required to make the best use of the Project as a model for future projects.
- The need for technical cooperation for rural development around the project sites must be examined with a view to determining how to utilize the coastal protection forests created under the Project from the viewpoint of integrated regional development which incorporates not only issues related to forestry but also issues related to agriculture, fisheries, irrigation, health care, poverty reduction, industrial development and gender.
- It is necessary to examine the possibility of using the experience obtained through the implementation of the Project to bring about the further creation of coastal protection forests based on ODA loans linked to small-scale AR-CDM projects and/or small-scale AR-CDM projects by private (afforestation) companies so that the creation of coastal protection forests will become widespread in Vietnam.

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Appendices

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4. Minute of Discussions

Location Map

Base 802750AI (C00082) 8-01

Outline of Component

- Plantation in Quang Nam and Quang Ngai Province: 892.06ha
- Operation road for vehicle: 7.63km
- Operation road for walking: 15.19
- Observation tower: 2
- Project sign board (large): 4
- Project sign board (small): 7

Perspective (Image)

3 years later

Note: These photographs show the image of creation of coastal protection forest under APSA as well as actual results of afforestaton work at the compartment number P-6-2(1) under PACSA.

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Abbreviations

The Study	Implementation Review Study on the Afforestation Project on Sandy Area in the Socialist Republic of Vietnam
The Project	The general term for the project which includes Japan's grant aid project (APSA below) and forest maintenance and protection for a period of 20years after the completion of APSA
The Study Team	Study team of Implementation Review Study on the Afforestation Project on Sandy Area in the Socialist Republic of Vietnam
B/D Study	Basic Design Study on the Afforestation Project on Sandy Area in the Socialist Republic of Vietnam
B/D Report	Basic Design Report on the Afforestation Project on Sandy Area in the Socialist Republic of Vietnam (APSA)
APSA	A project implemented as a grant aid project of the Government of Japan and part of the Project referred to above. The full title is the Afforestation Project on Sandy Area in the Socialist Republic of Vietnam.
Vietnam	The Socialist Republic of Vietnam
5MHRP	National Five Million Hectare Reforestation Program
A/P	Authorization to Pay
AR-CDM	Afforestation/Reforestation-CDM
B/A	Banking Arrangement
C/P	Counter Part
CDF	Comprehensive Development Framework
CDM	Clean Development Mechanism
CPRGS	Comprehensive Poverty Reduction and Growth Strategy
DARD	Department of Agriculture and Rural Development
DBH	Diameter at Breast Height
E/N	Exchange of Notes
FE/FC	Forest Enterprise / Forest Company
FSIV	Forest Science Institute of Vietnam
FSSP	Forest Sector Support Program and Partnership
GPS	Global Positioning System
GTZ	Deutsche Gasellschaft fur Technische Zusammenarbeit
HEPR	Hunger Eradication and Poverty Reduction Programmes
IP	Intersection Point or Point of Intersection
JBIC	Japan Bank for International Cooperation

JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteers
KfW	Kreditanstalt fuer Wiederaufbau
M/D	Minutes of Discussion
MARD	Ministry of Agriculture and Rural Development
MB	Management Board
MBFP	Management Board for Forestry Project
MPI	Ministry of Planning and Investment
ODA	Official Development Assistance
OJT	On-the-Job Training
P'C	People's Committee
PACSA	The Project for Afforestation on the Coastal Sandy Area in Southern Central Viet Nam
PQ	Pre-Qualification
QC	Quality Control
UNDP	United Nations Development Programme
US$	United States Dollar
VND	Vietnamese Dong
WB	World Bank

1. Background of the Project

1-1 Overview of the Country

The Socialist Republic of Vietnam (hereinafter referred to as "Vietnam") has a national land area of 332,000 km^2 of which approximately two-thirds consists of mountain and hilly areas. As of 2007, the total population is 85.30 million, most of which (73%) live in agricultural, fishing or mountain villages. Those engaged in agriculture, forestry or fisheries account for 57% of the total working population in various industries in the same year.

Since the adoption of the Doi Moi Policy, Vietnam has been pushing economic reform through a shift toward a market economy and the macro economy of Vietnam has been achieving certain positive results in terms of the continuance of a high economic growth rate, containment of inflation and job security. However, from the viewpoint of microscopic economic and fiscal management relating to the reform of state enterprises and reform of the administrative structure and government finance, the national economy still significantly relies on state enterprises.

The socioeconomic development strategy is renewed every 10 years in Vietnam and a five year national development plan is formulated to implement the strategy. The current Eighth Five Year National Development Plan (2006–2010) aims at Vietnam breaking away from the category of a developing country through sustainable economic development, while continually upholding the Doi Moi Policy adopted in 1986. Special emphasis is placed on the reform of the economic structure, improvement of the labor composition, modernization of industries, promotion of science and technology and achievement of high quality education. At the same time, the achievement of poverty reduction is sought to establish a culturally rich and safe society in order to provide a secure social environment for the people. Concerning government finance, tax and oil-related revenue is the main revenue but the expenditure far exceeds the revenue, resulting in an annual deficit of some VND 300 billion.

Vietnam is attracting much world attention as a promising country for foreign aid. It has become a pilot country for the "Comprehensive Development Framework (hereinafter referred to as "CDF")" advocated by the "World Bank (hereinafter referred to as "WB")" and has been actively attempting to achieve institutional improvement, capacity building and improved aid effects through active participation in policy dialog and joint work with donors utilizing the partnership and other frameworks. Vietnam prepared the "Comprehensive Poverty Reduction and Growth Strategy (hereinafter referred to as "CPRGS")" as a "Poverty Reduction Strategy Paper (hereinafter referred to as "PRSP")" based on the CDF in May 2005 and was the first country in Asia to do so. This CPRGS has been integrated in "the

Eighth Five Year National Development Plan (2006–2010)" which determines the basic policies of Vietnam. This means that two policies which used to exist in parallel have been unified to promote economic growth and poverty reduction simultaneously.

Since 1992, Japan has been providing full-scale aid for Vietnam and has been the top donor since 1995. Japan has adopted a stance of assisting the development of Vietnam notably from the viewpoint of a mutually dependent economic relationship but also from the humanitarian as well as social viewpoints and has identified three priority areas, i.e. the promotion of growth, livelihood and social improvement and institutional development.

1-2 Background of the Project

While Vietnam was once endowed with abundant forest resources, the forest area was substantially reduced due to the long war, urbanization and other reasons, now forest area per capita is the lowest in the Asian counties. In the face of such a situation, the Government of Vietnam was to implement the National Five Million Hectare Reforestation Program (5MHRP) aimed at the reforestation of 14.3 million ha by 2010. Although active efforts are being made in terms of forest conservation and planting, the creation of 100,000 ha of coastal protection forests is said to be urgently required.

Vietnam has a long coastline stretching from north to south and the coast in the southern central part of the country is lined with a series of sandy areas. Agricultural crops and infrastructure facilities are damaged by strong winds and shifting sand caused by typhoons and monsoons, severely affecting the lives of local residents. To improve the situation, the Government of Vietnam made a request for Japanese assistance for the afforestation/reforestation of these coastal sandy areas and this request resulted in the commencement of "the Project for Afforestation on the Coastal Sandy Area in Southern Central Viet Nam (PACSA)", a grant aid project of the Government of Japan. Under PACSA, 3,652.88 ha (actual planted area of 3,167.11 ha) of coastal protection forests were created in Quang Nam Province and Phu Yen Province before its completed in April, 2005.

The Government of Vietnam has since been promoting the creation of coastal protection forests using PACSA as the model. However, as no planting has been conducted at difficult planting sites, such as wind erosion sites and shifting sand sites, many difficult planting sites remain in the southern central part of Vietnam where damage by strong winds and shifting sand still frequently occurs due to the lack of coastal protection forests.

In view of the historical background described above, the Government of Vietnam has made a new request to the Government of Japan, which is to assist the creation of 9,480 ha of coastal protection forests in Quang Nam Province, Quang Ngai Province, Binh Dinh Province and Khanh Hoa Province. Because of the high level of technical difficulty of planting to respond to this request, the determination of an appropriate scope of cooperation by means of checking the requested sites, necessary planting techniques and implementation system was essential. For this reason, a preparatory study was conducted in the period from December 2005 to February 2006. As a result of this preparatory study, it was decided to conduct a basic design study featuring 5,200 ha of coastal areas in the four provinces to check the necessity, relevance and urgency of the requested project in detail.

In the basic design study, studies are conducted and discussions were held with Vietnamese side on items such as confirmation of plantation boundaries, plantation techniques to be introduced,

confirmation on management system, responsibilities, procurement of equipments.

The study team and the Vietnamese side came to conclusion after the study that the project sites will be the coastal areas in three Provinces, such as Quang Nam Province, Quang Ngai Province, and Binh Dinh Province, the total area of 2,598.47 ha. Over-rapped areas with other land use plans (the Vietnamese side waived Khanh Hoa Province) and unsuitable areas for planting are excluded as the result of the study.

During the last visit of the Basic Design study team, it was found that portion of PACSA plantation area in Quang Nam province was cleared for titanium mining purpose, without reporting it to the Japanese side. It also became conspicuous that there are plans such as "transmigration zone" and "economic development zone" over-lapping with the coastal area of Quang Nam province. The Japanese side had decided to postpone implementation of a new grant aid on this matter and had requested a regret and presentation of recovery scheme, together with confirmation of avoidance with other development plans from the Vietnamese side, to resume the plantation project assisted by the Japanese.

Upon the request from the Japanese side, Ministry of Agriculture and Rural Development (MARD) manifested a plan of plantation of the same size with the cleared PACSA area. MARD also explained that development plans in coastal area of Quang Nam province are in preliminary stage of the scheme; and it promised that MARD would hold discussion with Japanese side prior to the development if cutting of trees would be necessary, and will pay attention for avoidance of over-rapping of the development plans with the new plantation sites of the Japanese grant aid project.

With the proposal and explanations made by the Vietnamese side, the Japanese government has conducted a project implementation study. During the implementation review study, it was confirmed that the replanted trees by the Vietnamese side, whose area and the function of them were found to be the equivalent to the cleared trees of PACSA in Quang Nam province.

Meanwhile, 5MHRP is considered to be a priority Program of the Ten Year Socioeconomic Development Strategy (2001–2010) which is the medium to long-term development policy of Vietnam, the Eighth Five Year National Development Program (2006–2010) and the Forest Development Strategy 2001–2010 (the revised Forest Development Strategy (draft) 2006–2020 is currently being debated) which is based on the above strategy and Program. Coordinated aid is being provided for 5MHRP as well as the Forest Development Strategy 2001–2010, the higher program of 5MHRP, by the partnership group for the Forest Sector Support Program and Partnership (FSSP). The request project does not, therefore, overlap with the aid projects of other donors and will directly contribute to 5MHRP as a complementary project to other projects.

The Eighth Five Year National Development Program (2006 – 2010) states that 5MHRP is integrated to the Hunger Eradication and Poverty Reduction Programmes (HEPR) implemented by MARD to promote agriculture and rural development as part of reviews to increase the efficiency of 5MHRP.

1-3 Situation Surrounding the Project

1-3-1 Project Implementation System

The responsible body for the implementation of the Project is MARD of the central government, of which the Forestry Department in charge of the promotion of afforestation projects etc. and the Forestry Protection Department in charge of forest management and protection as well as the management of the national parks are responsible for the forestry sector.

The provincial level implementation body is DARD which is controlled by P'C in each province. The Forestry Development Division of DARD is in charge of guidance and supervision related to the creation, management and protection of forests in the province with the support and guidance of MARD.

For the implementation of the requested Japanese assistance, i.e. APSA, the relationship between these organizations in Vietnam and the Japanese organizations is shown in Figure 1-1.

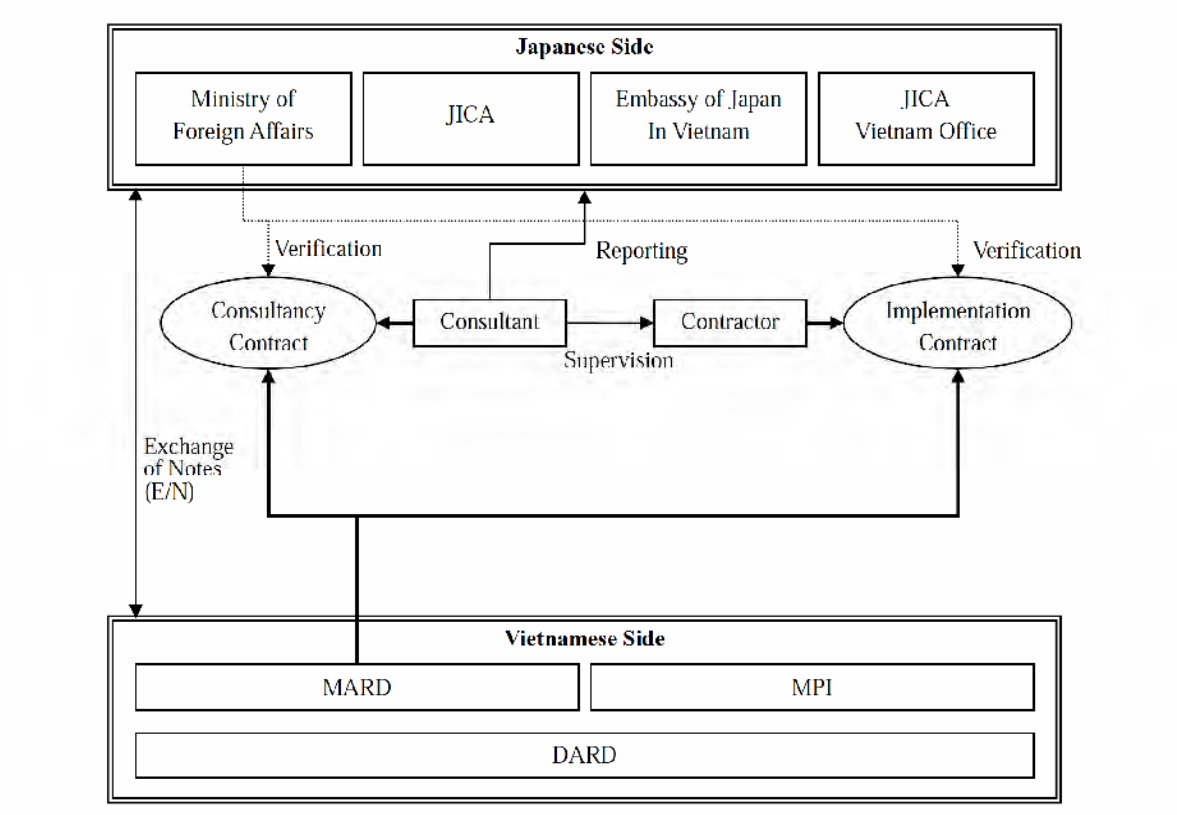


Figure 1-1 Relationship between the Various Organizations Involved in the Implementation of APSA

A management board (MB) will be set up at each Vietnamese organization involved in APSA to act as a window (functioning as an implementation body in practice) for such organization. Each MB will

consist of 2 to 5 full-time engineers and clerical workers and will be directly involved in the implementation of APSA. In all, hierarchical implementation with close collaboration between those on the upper level and those on the lower level as shown in Figure 1-2 will be established in Vietnam.

Although these MBs will be dismantled after the completion of APSA, their members will remain at MARD or respective DARD to be continually responsible for conducting practical operation and maintenance work under the Project.

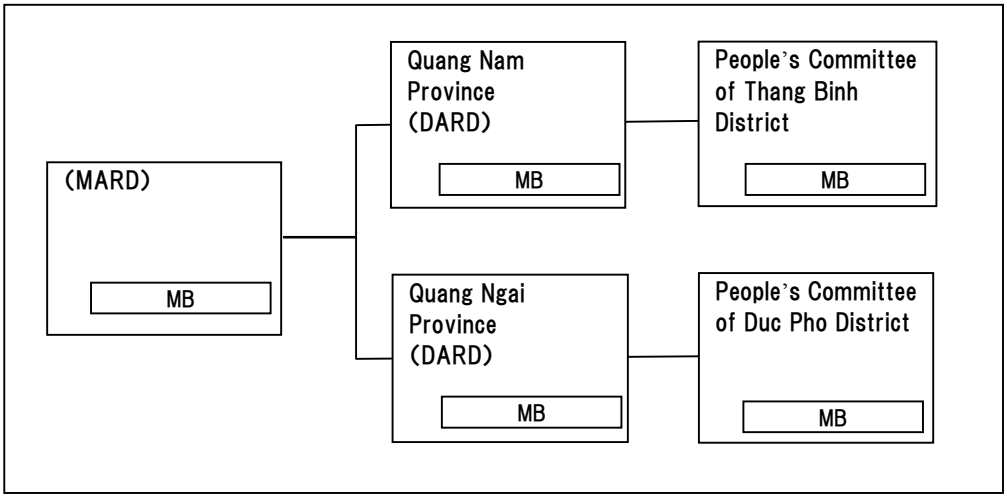


Figure 1-2 Project Implementation System on the Vietnamese Side

1-3-2 Natural Conditions

(1) Topography

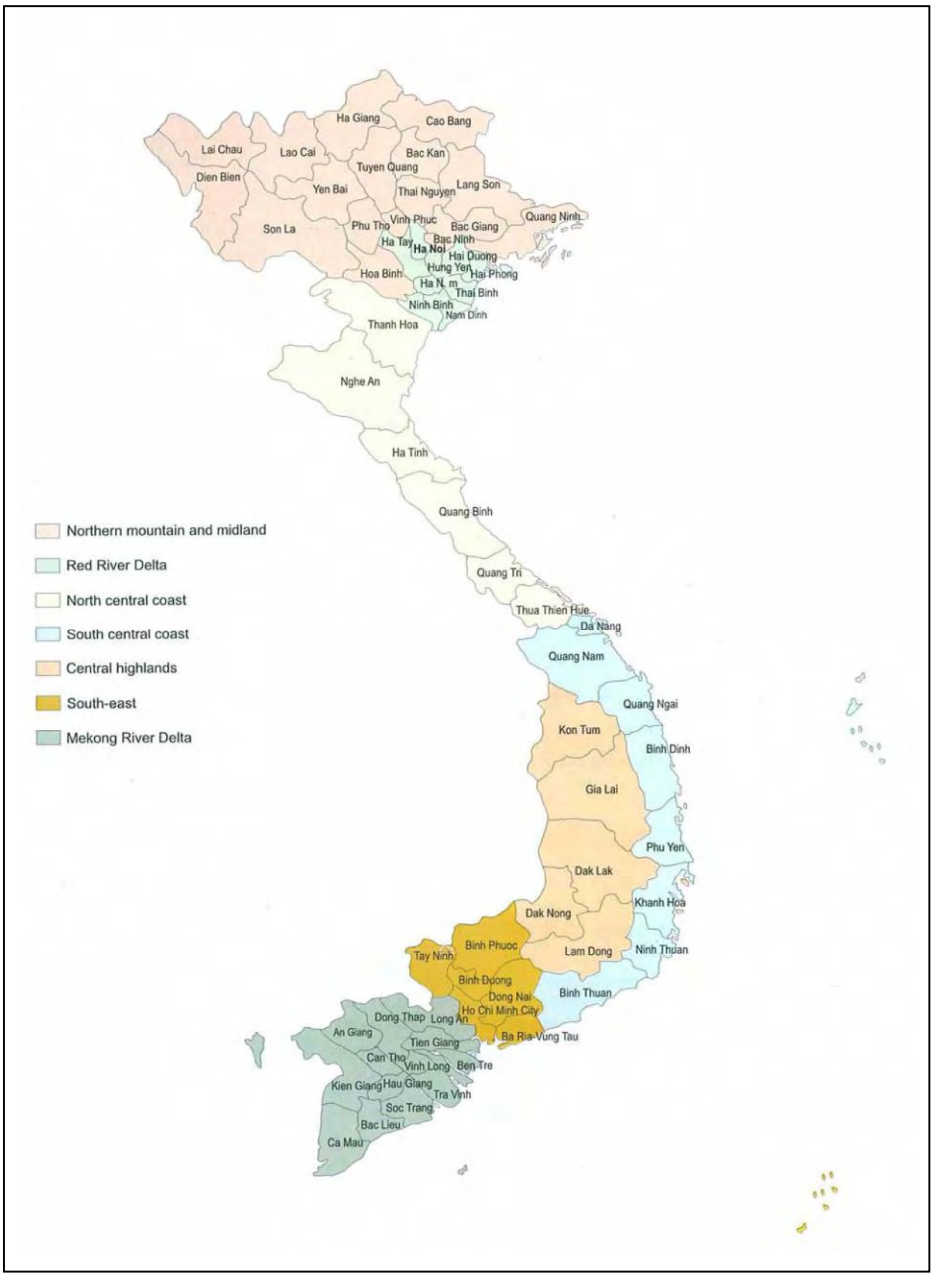
Vietnam is a S-shaped country situated on the eastern side of the Indochinese Peninsula facing the East China Sea and has a national land area of 332,000 km^2. Its exact location is between 8°30'N and 23°22'N and between 102°10'E and 109°24'E. It stretches long in the north–south direction and borders China to the north and Laos and Cambodia to the west.

The country is generally classified into seven regions, i.e. "Northern Mountain", "Red River Delta", "North Central Coast", "South Central Coast", "Central Highlands", "South-East" and "Mekong River Delta" (see Figure 1-3). The Northern Mountain and Midland Region and the Red River Delta Region are combined to form the northern part, while the North Central Coast Region, the South Central Coast Region and the Central Highlands Region form the central part. The remaining South-East Region and the Mekong River Delta Region form the southern part. The project sites are located in the South Central

Coast Region.

Quang Nam Province has two relatively large river systems, i.e. the Cai River and Thu Bon River System and the Tam Ky River System. Even though the area of the province exceeds 10,000 km^2, plains account for just over 10%. These plains widen toward the sea and their immediate hinterland consists of gentle hilly areas with an elevation of 200 m to 600 m. Further inland, these hills rise to form the Truong Son Range which rises above an elevation of 1,000 m at the border with Laos, forming the watershed. The project sites are scattered on the alluvial plains where lagoons created by blockage of the mouth of rivers by abundant sediment transported through the Thu Bon River System eventually form sand dunes.

In Quang Ngai Province, a long and narrow plain covering an area of 1,200 km^2 spreads along the coast. This plain was formed by the Tra Bong River system, the Tra Khuc River system and the Ve River system. Despite this, the plain only accounts for 20% of the total area of the province. The formulation process of this plain is almost identical to that of the plains in Quang Nam Province and, from a geological point of view, this plain consists of sandy soil. As the southern part of the Truong Son Range gradually nears the coastline, the plain in the southern part of the province has mountainous hinterland. The project sites are scattered in narrow sandy areas which are sandwiched by the mountain range and the sea in the southern part of the province.



Source: UNDP: Viet Nam Development Cooperation Report 2004 – Hanoi, 2005

Figure 1-3 Regions and Provinces of Vietnam

(2) Soils and Geology

The sandy soil areas distributed in the coastal sandy areas in the central part are formed by sandy soil discharged by rivers to the sea and then transported back to the land by the sea current and wind. Accordingly, local soils are classified as soils affected by the topography. By color, these soils can be described as white, yellow, red, gray, etc. but soil of any color contains hardly any organic matter and is sterile with more than 85% being made up of SiO_2. These soils are, therefore, extremely unsuitable for

plant growth. When the proportion of Fe_2O_3 is relatively high, the soil color approaches pale yellow. When the proportion of Al_2O_3 is high, the soil color becomes red. When the proportions of these two substances are low, the soil color becomes white because of the influence of SiO_2. From a geological point of view, red sandy soil belongs to the Pleistocene of 150,000 – 600,000 years ago, white sandy soil belongs to the early Holocene (alluvial period) of 5,000 – 15,000 years ago, and yellow sandy soil belongs to the recent epoch. The project sites are characterized by sandy soil belonging to the present epoch with quartz being the main constituent originating from granite, the parent rock. The color tone is white and the sand grains principally made up of SiO_2. In places, the color is extremely pale yellow or brown. One thing worthy of special note is the presence of titanium in a manner similar to iron sand in the coastal soils in the four provinces, especially Binh Dinh Province.

(3) Climate

Vietnam is strongly affected by the South China Sea and belongs to the tropical monsoon zone and sub-tropical monsoon zone. The level of the annual rainfall, seasonal changes and arrival of typhoons are determined by the conditions of the southwesterly and northeasterly monsoons, resulting in many climate differences from one region to another.

In the central part where the project sites are located, winter (from mid-November to late March) comes at the end of the rainy season unlike other parts of the country. In winter, the wind blows from the north or northwest and the level of rainfall is high. Dry hot wind from Laos starts to blow in spring (from April to mid-May) and a hot wind from the west of southwest strongly prevails in summer (from mid-May to late September) to characterize the fully developed dry season in contrast to other parts. The hot wind is accompanied by the *föhn* phenomenon characterized by hot and dry air. In autumn (from October to mid-November), unlike other parts which move into the dry season from the rainy season, the central part has a heavy rainy season. Typhoons which are born in the western Pacific Ocean or the South China Sea move due west, directly hit the central part of Vietnam. Some of these have a radius of 200 – 300 km and move at a speed of 90 – 120 km/hr, causing torrential rainy and flooding everywhere. In particular, Typhoon No. 6 (internationally numbered 15; Xangsane) which landed in the central part on the 1st October, 2006 had an atmospheric pressure of 955 hPa at the center and a maximum wind velocity of 40 m/s, causing extensive damage to the coastal areas of Quang Nam Province with a high tide etc.

The following observations can be made based on meteorological data recorded at three weather stations located in Tam Ky City in Quang Nam Province, Quang Ngai City in Quang Ngai Province and Quy Nhon City in Binh Dinh Province.

In terms of rainfall, some rain is observed in August by all three weather stations and the amount of rainfall sharply increases in September, reaching a peak in October. There is a lot of rain until December but the amount of rainfall quickly declines in January. As such, the rainy season lasts from September to December in these provinces. The total rainfall in the rainy season is 2,026.8 mm in Tam Ky City, accounting for 76% of the city's annual rainfall of 2,674.3 mm, 1,854.0 mm in Quang Ngai City, accounting for 75% of the city's annual rainfall of 2,484.4 mm.

The wind directions in winter (from October to March) differ from those in summer (from April to September) at each weather station. In winter, the wind mainly blows from the directions between the north and the east in Tam Ky City and the prevailing wind comes from the northeast. In Quang Ngai City, the wind mainly blows from the directions between the northwest and the northeast and the prevailing wind comes from the north. In summer, the wind mainly blows from the directions between the northwest and the southwest as well as the directions between the northeast and the southeast in Tam Ky City and the frequency of westerly and easterly winds is almost the same. In Quang Ngai City, the wind mainly blows from the southeast, the east and the northwest..

The mean temperature, maximum temperature and minimum temperature are 25.6°C, 40.1°C and 12.0°C respectively for Tam Ky City, 26.0°C, 40.5°C and 12.4°C for Quang Ngai City and 27.1°C.

(4) Vegetation

Several species of herbaceous plants capable of growing on sand dunes are observed at ordinary sandy areas, frequently flooded areas and areas adjacent to the shoreline. The ground coverage of these plants is less than 1% but the subterranean stems of these plants are well developed. Dying forest areas consist of Casuarina forests planted in the past. Their growth performance is poor and treeless land is observed here and there.

(5) State of Forests in the Target Provinces and Near the Project Sites

The forest area by each target province of the Project is listed in Table 1-1 along with the total forest area in Vietnam which is included in the table for reference purposes. In each of the two provinces, while the forest area has been increasing, a closer look reveals a tendency for a decrease of the natural forests to be compensated for by the creation of man-made forests. As described in "2-1-1 Overall Goal and Project Purpose", 5MHRP aims at planting 14.3 million ha nationwide by 2010 to increase the forest ratio to 43.4% but the achievement of this target continues to appear to be difficult.

Large-scale afforestation projects have been implemented in the three target provinces of the Project

based on the assistance of WB, KfW, JBIC, etc. With the efforts of the parties concerned, 5,400 – 10,600 ha of man-made forests have been created in the last two years alone. Nevertheless, these large-scale afforestation projects are restricted to mountainous areas and no afforestation project is in progress in the coastal plains or hillsides of areas adjacent to the project sites. As such, forests in the said areas are rather poor in terms of both quality and quantity. To be fair, however, minor afforestation work is in progress by DARD and other bodies in areas adjacent to the project sites using domestic funds and funds from other master development plans. Most of the target sites of such work are characterized by a low level of technical difficulty for planting.

Table 1-1 Forest Area in Vietnam and Two Target Provinces

Primary Category	Secondary Category	2003	2005
Vietnam	Forest Area Forest Ratio	11,974,600 (36.1%)	12,418,500 (37.4%)
Total Area 33,200,000	Man-Made Forest Area	2,100,900	2,889,100
	Natural Forest Area	9,873,700	9,529,400
Quang Nam Province	Forest Area Forest Ratio	443,900 (42.7%)	448,100 (43.1%)
Total Area 1,040,740	Man-Made Forest Area	54,200	59,600
	Natural Forest Area	389,700	388,500
Quang Ngai Province	Forest Area Forest Ratio	159,400 (31.0%)	169,600 (33.0%)
Total Area 513,760	Man-Made Forest Area	55,500	66,100
	Natural Forest Area	103,900	103,500

Source: Statistical Year Book 2003
Statistical Year Book of Vietnam 2005

The forests seen in areas adjacent to the project sites include Casuarina forests created since the late 1970's, Cashew orchards, copses composed of eucalyptus and shrubs and orchards of coconut palms and others near residential areas. All of these are geographically restricted to sites with relatively good soil and other conditions, and some forests appear to have degraded due to aging.

The results of the fact-finding survey on a Casuarina forest created since the 1970's show that the average tree height is reasonably high at 11.4 m in places which are at least 180 m away from the shoreline and enjoy better conditions. Nevertheless, the tree density of 531 trees/ha is fairly sparse. Meanwhile, at places within 115 m of the shoreline, the average tree height is low at 3.0 m but the tree density is high at 1,594 trees/ha (see Figure 1-4 Conceptual Profile of Existing Casuarina Forest). This particular stand is one of the most well-established existing Casuarina forests in areas adjacent to the project sites and the physiognomy of most local stands is poorer than this.

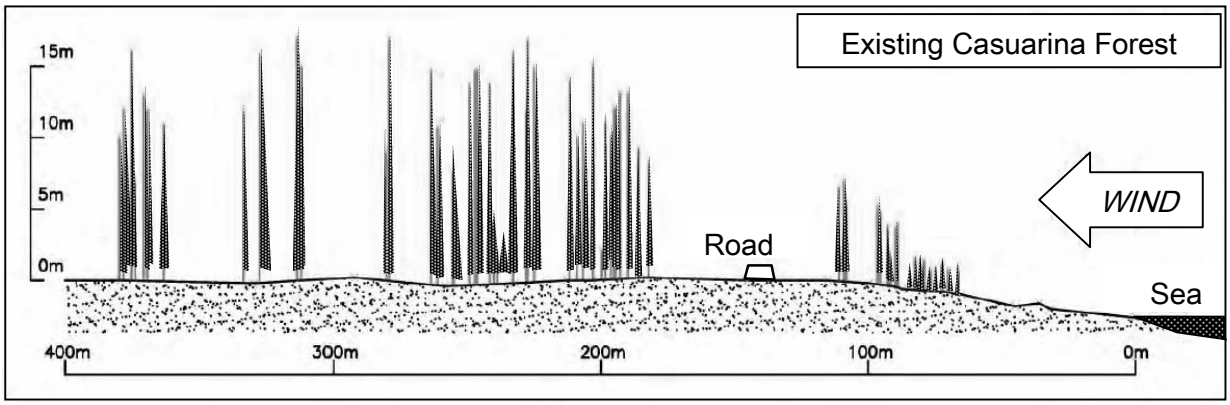


Figure 1-4 Conceptual Profile of Existing Casuarina Forest

Although Casuarina forests and shrubs are observed in the potential target areas, the remaining stands in the project sites are generally poor with sporadic high trees, dwarf trees and old trees because of the practice of designated sites as leftover areas if the general assessment results of the tree height, tree density, tree health, etc. meet certain criteria. In fact, there are many sites where not only trees but also herbaceous plants cannot grow.

1-3-3 Environmental and Social Considerations

(1) Present Conditions of the Social Environment

The population size and area by type of land use, numbers of public facilities in the 8 target communes are compiled in Table 1-2, Table 1-3 and respectively. According to these tables, the total population of the target communes in the areas subject to conservation efforts under the Project is 20,985 in Quang Nam Province, 37,283 in Quang Ngai Province, totaling 58,268. The total area of objective communes is 8,689ha whereas residential areas (1,004 ha), paddy fields (1,984 ha) and other farmland (2,835 ha) are considered.

Table 1-2 Demographic Composition of 8 Target Communes

Province	District	Commune	Population				
			No. of Households	Population	Population of Men	Population of Women	Working Population (age: 16-65)
Quang Nam	Thang Binh	Binh Minh	1,525	7,360	3,601	3,759	3,672
		Binh Dao	1,876	7,673	3,684	3,989	3,862
		Binh Hai	424	5,952	2,903	3,049	3,058
	Subtotal		3,825	20,985	10,188	10,797	10,592
Quang Ngai	Duc Pho	Pho An	2,337	10,327	5,139	5,188	5,946
		Pho Quang	1,821	7,595	-	-	3,985
		Pho Vinh	1,759	8,762	4,281	4,481	6,354
		Pho Khanh	1,197	5,033	2,651	2,382	2,780
		Pho Chau	1,145	5,566	2,718	2,848	3,208
	Subtotal		8,259	37,283	14,789	14,899	22,273
Grand Total			12,084	58,268	24,977	25,696	32,865

Table 1-3 Area by Land Use in 8 Target Communes

Province	District	Commune	Area (ha)					
			Total Area	Residential Area	Paddy Fields	Other Farmlands	Forests	Fisheries Facilities
Quang Nam	Thang Binh	Binh Minh	1,180	230	0	36	678	35
		Binh Dao	1,150	214	580	144	290	12
		Binh Hai	1,246	328	356	132	252	89
	Subtotal		3,576	772	936	312	1,220	136
Quang Ngai	Duc Pho	Pho An	-	80	329	-	300	24
		Pho Quang	987	34	87	820	110	-
		Pho Vinh	1,575	53	357	-	290	17
		Pho Khanh	566	42	115	311	96	-
		Pho Chau	1,985	23	160	1,392	410	-
	Subtotal		5,113	232	1,048	2,523	1,206	41
Grand Total			8,689	1,004	1,984	2,835	2,426	177

Table 1-4 Public Facilities in 8 Target Communes

Province	District	Commune	No. of Public Facilities					
			Elementary School	Junior High School	High School	University	Government Offices	Medical Offices
Quang Nam	Thang Binh	Binh Minh	1	1	0	0	1	2
		Binh Dao	1	1	1	0	1	1
		Binh Hai	1	1	0	0	1	1
	Subtotal		3	3	1	0	3	4
Quang Ngai	Duc Pho	Pho An	5	1	0	0	0	1
		Pho Quang	5	1	0	0	1	1
		Pho Vinh	6	1	0	0	5	1
		Pho Khanh	4	0	0	0	4	0
		Pho Chau	4	1	0	0	0	1
	Subtotal		24	4	0	0	10	4
Grand Total			27	7	1	0	13	8

During the field survey, the Study Team requested the Vietnamese side at the provincial, district and commune levels to provide records describing actual damage by shifting sand and strong winds so that such damage could be quantified. However, the Study Team was told that no constant surveying or checking of such damage locally was conducted and that a survey is only conducted when severe damage is caused by a typhoon etc. Quantitative assessment of the damage based on existing materials was judged practically impossible and it was decided to conduct a questionnaire survey with local residents in coastal sandy areas near the project sites to establish a picture of the damage. The questionnaire survey results are shown in Table 1-5 and Table 1-6, and it is clear that the residents of agricultural or fishing villages near coastal sandy areas constantly suffer repeated damage by shifting sand and strong winds every year.

Table 1-5 Damage by Strong winds

	Total Number	Quang Nam	Quang Ngai
Total Number of Respondents	183	99	84
Damage Experienced	161 (88.0%)	89 (89.9%)	72 (85.7%))
(Frequency) 1 - 2 times/year	100 (54.6%)	67 (67.7%)	33 (39.3%)
(Frequency) 3 - 4 times/year	43 (23.5%)	13 (13.1%)	30 (35.7%)
(Frequency) 5 or more times/year	14 (7.7%)	5 (5.1%)	9 (10.7%)
(Damage to) House	107 (58.5%)	56 (56.6%)	51 (60.7%)
(Damage to) Agricultural Crops	23 (12.6%)	13 (13.1%)	10 (11.9%)
(Damage to) Roads	16 (8.7%)	7 (7.1%)	9 (10.7%)
(Damage to) Farmland	8 (4.4%)	7 (7.1%)	1 (1.2%))
(Damage to) Fruit Trees	31 (16.9%)	7 (7.1%)	24 (28.6%)

Note: Multiple selections are permitted.

Table 1-6 Damage by Shifting Sand

	Total Number	Quang Nam	Quang Ngai
Total Number of Respondents	183	99	84
Damage Experienced	99 (54.1%)	66 (66.7%)	43 (51.2%)
(Frequency) 1 - 2 times/year	58 (31.7%)	45 (45.5%)	13 (15.5%)
(Frequency) 3 - 4 times/year	37 (20.2%)	14 (14.1%)	23 (27.4%)
(Frequency) 5 or more times/year	12 (6.6%)	5 (5.1%)	7 (8.3%)
(Damage to) House	44 (24.0%)	12 (12.1%)	32 (38.1%)
(Damage to) Agricultural Crops	33 (18.0%)	29 (29.3%)	4 (4.8%)
(Damage to) Roads	26 (14.2%)	4 (4.0%)	22 (26.2%)
(Damage to) Farmland	14 (7.7%)	10 (10.1%)	4 (4.8%)
(Damage to) Fruit Trees	24 (13.1%)	3 (3.0%)	21 (25.0%)

Note: Multiple selections are permitted.

The number of respondents, their vocational background and distribution of the annual income are shown in Table 1-7 through Table 1-9. Although many farming and fishing households near coastal sandy areas are said to be poor, the questionnaire survey results indicate the sampling of relatively wealthy households with an average annual income of VND 17,199,673 /year (approximately US$ 1,078 /year). This finding is attributed to the relatively high proportion of fishing households which can expect to earn a higher income than households relying on farming. It is also possible that the heads of hamlets of guided the questioners selected wealthier households first, followed by the selection of less wealthy households to boost the quality of the questionnaire survey results.

Table 1-7 Number of Questionnaire Respondents

	Total Number	Quang Nam	Quang Ngai
Total Number of Respondents (Households)	183	99 22.2%	84 18.8%
Male	166 (90.7%)	95 (96.0%)	71 (84.5%)
Female	16 (8.7%)	3 (3.0%)	13 (15.5%)
Unknown	1 (0.6%)	1 (1.0%)	0 (0.0%)

Table 1-8 Share by Vocation of Questionnaire Respondents

	Total Number	Quang Nam	Quang Ngai
Total Number of Respondents	183	99	84
Farming	113 (61.7%)	66 (66.7%)	47 (56.0%)
Fishing	91 (49.7%)	30 (30.3%)	61 (72.6%)
Self-Employed	61 (33.3%)	54 (54.5%)	7 (8.3%)
Employed	21 (11.5%)	7 (7.1%)	14 (16.7%)
Other	56 (30.6%)	39 (39.4%)	17 (20.2%)

Table 1-9 Distribution of Annual Income among Questionnaire Respondents

	Total Number	Quang Nam	Quang Ngai
Total Number of Respondents	183	99	84
～VND 10,000,000 /year	34 (18.6%)	28 (28.3%)	6 (7.1%)
～VND 20,000,000 /year	68 (37.2%)	36 (36.4%)	32 (38.1%)
～VND 30,000,000 /year	50 (27.3%)	23 (23.2%)	27 (32.1%)
～VND 40,000,000 /year	20 (10.9%)	9 (9.1%)	11 (13.1%)
VND 40,000,001 /year or more	11 (6.0%)	3 (3.0%)	8 (9.5%)

Almost all the respondents answered that they feel necessary of coastal protection forest, for protection from wind and sand (Table 1-10). The respondents showed strong willingness to cooperate with the project (Table 1-11).

Table 1-10 Necessity for Coastal Protection Forests

< Reason for Necessity >	Total Number	Quang Nam	Quang Ngai
Total Number of Respondents	183	99	84
Necessity felt	180 (98.4%)	99 (100.0%)	81 (96.4%)
Windbreak Effect	133 (72.7)	55 (55.6%)	78 (92.9%)
Shifting Sand Prevention Effect	134 (73.2%)	62 (62.6%)	72 (85.7%)
Water Retention Effect	32 (17.5%)	27 (27.3%)	5 (6.0%)
Climate Mitigation Effect	41 (22.4%)	40 (40.4%)	1 (1.2%)
Tidal Water Control Effect	1 (0.5%)	0 (0.0%)	1 (1.2%)
Others	58 (31.7%)	48 (48.5%)	10 (11.9%)

Note: Multiple selections are permitted.

Table 1-11 Cooperation for the Project

< Reason for Cooperation >	Total Number	Quang Nam	Quang Ngai
Total Number of Respondents	183	99	84
Willing to Cooperate	178 (97.3%)	97 (98.0%)	81 (96.4%)
Windbreak Effect	34 (18.6%)	29 (29.3%)	5 (6.0%)
Shifting Sand Prevention Effect	15 (8.2%)	11 (11.1%)	4 (4.8%)
Increase of Income and Other Economic Effects	34 (18.6%)	13 (13.1%)	21 (25.0%)
Environmental Improvement	44 (24.0%)	32 (32.3%)	12 (14.3%)
Many Advantages of the Project and Protection Forests	8 (4.4%)	0 (0.0%)	8 (9.5%)
Backing by the local government	0 (0.0%)	0 (0.0%)	0 (0.0%)
Responsibility of the local community	38 (20.8%)	14 (14.1%)	24 (28.6%)
Other	51 (27.9%)	40 (40.4%)	11 (13.1%)

Note: Multiple selections are permitted.

When asked about the preferred species for planting under the Project, the answers varied from one province to another (see Table 1-12). In Quang Nam Province where PACSA was implemented, many of the respondents proposed Casuarina, Acacia and Cashew. In Quang Ngai province, Casuarina is clearly the favorite, presumably because of the unfamiliarity of other species for planting and the tendency to plant Cashew trees near the home rather than at a coastal sandy site.

Table 1-12 Preferred Species for Planting under the Project

	Total Number	Quang Nam	Quang Ngai
Total Number of Respondents	183	99	84
Casuarina	136 (74.3%)	54 (54.5%)	82 (97.6%)
Acacia	64 (35.0%)	63 (63.6%)	1 (1.2%)
Cashew	33 (18.0%)	30 (30.3%)	3 (3.6%)
Eucalyptus	18 (9.8%)	11 (11.1%)	7 (8.3%)
Pine	3 (1.6%)	3 (3.0%)	0 (0.0%)
Mango	3 (1.6%)	3 (3.0%)	0 (0.0%)

Note: Multiple selections are permitted.

(2) Consideration of the Social Environment

Based on the questionnaire survey results described above, the following considerations were given to the basic plan.

i Difficult planting sites should be actively incorporated in the Project. These sites are frequently submerged areas and areas adjacent to the shoreline in this project.

ii Design features promising tree growth (use of fertilizer and soil improvement agent, introduction of ancillary planting work, etc.) should be adopted to minimize damage by strong winds and shifting sand.

iii The planting work should not require advanced technologies or skills so that local residents can easily participate in the planting work.

iv Design features incorporating the requests of local residents (selection of preferred species etc.) should be adopted so that local residents can actively participate in the planting work and the subsequent maintenance (protection) of coastal protection forests.

The field reconnaissance which was conducted separately from the questionnaire survey discovered that some unpaved access roads will become muddy in the rainy season. As PACSA experienced objections by local residents to the use of this kind of road around the target compartments by the work vehicles, resulting in problems at some sites, the design for the Project excludes the use of this type of access road.

v The design for the Project should exclude those unpaved roads around the target compartments which become muddy in the rainy season as access roads for the work vehicles.

(3) Present Situation of the Natural Environment

As the Project will not only improve the habitat for wild animals but will also contribute to the conservation of biodiversity through planting at coastal sandy sites, extensive consideration of any possible adverse impacts on the natural environment is unnecessary. Accordingly, the question included in the questionnaire simply asked about the present situation of animals and plants at coastal sandy sites and in the vicinity of residential areas. In the case of plant species, however, no replies were made regarding native species or wild species, presumably because of the fact that the target sites are located on coastal lowland which is much more developed compared to mountain areas. Because of this, the question on plant species is not dealt with in this report.

In regard to wild animals in the project areas, most of the respondents said that there has not been a conspicuous decline. However, valuable responses regarding the decline of certain animal species were made as shown in Table 1-13.

While a quantitative survey was not conducted under PACSA, there is an impression that the number of insects, frogs, snakes and wild birds have increased since this project. It may well be necessary in the future to check whether the number of wild animals has increased because of the implementation of the Project.

Table 1-13 Noticeably Decreasing Wild Animals in Coastal Sandy Areas and Near Residential Areas

	Total Number	Quang Nam	Quang Ngai
Total Number of Respondents	183	99	84
None	88 (48.1%)	27 (27.3%)	51 (60.7%)
Rabbits	8 (4.4%)	7 (7.1%)	1 (1.2%)
Sea Turtles	9 (4.9%)	5 (5.1%)	4 (4.8%)
Tortoises	16 (8.7%)	0 (0.0%)	16 (19.0%)
Foxes	15 (8.2%)	3 (3.0%)	12 (14.3%)
Salamanders	51 (27.9%)	46 (46.5%)	5 (6.0%)
Deer	0 (0.0%)	0 (0.0%)	0 (0.0%)
Mice	0 (0.0%)	0 (0.0%)	0 (0.0%)
Snakes	39 (21.3%)	18 (18.2%)	21 (25.0%)
Squirrels	0 (0.0%)	0 (0.0%)	0 (0.0%)
Others	10 (5.5%)	4 (4.0%)	6 (7.1%)

Note: Multiple selections are permitted.

As the opinion was expressed in the course of the questionnaire survey that the number of sea turtles had decreased, another questionnaire survey was conducted on the sighting of sea turtles. Although the findings were inconclusive at the preparatory study stage, it was discovered that many people have actually sighted sea turtles (see Table 1-14).

According to this questionnaire result, more than half of the respondents have sighted a sea turtle(s) once or twice a year. This finding suggests the possibility that sea turtles may land at the target coastal sandy areas to lay their eggs even though the number of individuals may have decreased.

One frequently stated reply to the reason for the decline of individuals is that it is natural to catch and eat

the animals when sighted. This answer is common for most animals, including sea turtles. While various restrictions are being strengthened in Vietnam to stop the decline of wild animals, the actual situation is that many people still catch and eat them. This situation implies a difficulty of ensuring the permanent conservation of some species without the introduction of protective measures even if the biodiversity increases with the implementation of the Project.

Table 1-14 Landing and Laying of Eggs by Sea Turtles

	Total Number	Quang Nam	Quang Ngai
Total Number of Respondents	183	99	84
No reply	13 (7.1%)	12 (12.1%)	1 (1.2%)
Not Sighted	72 (39.3%)	44 (44.4%)	28 (33.3%)
Sighted	98 (53.6%)	43 (43.4%)	55 (65.5%)
(Annual Frequency) 1 - 2 times	72 (39.3%)	34 (34.3%)	38 (45.2%)
(Annual Frequency) 3 - 4 times	22 (12.0%)	7 (7.1%)	15 (17.9%)
(Annual Frequency) 5 - 6 times	1 (0.5%)	0 (0.0%)	1 (1.2%)
(Annual Frequency) 7 times or more	2 (1.1%)	1 (1.0%)	1 (1.2%)
(Annual Frequency) No Reply	1 (0.5%)	1 (1.0%)	0 (0.0%)

(4) Consideration of the Natural Environment

The following considerations are given to the planning of the Project based on the questionnaire survey results.

i At those planting sites with low technical difficulty, the creation of mixed forests should be planned to ensure biodiversity.

ii No work (relating to ancillary planting work and the temporary introduction of operation roads) should be conducted in the zone between frontal sand dunes and the shoreline to avoid any adverse impacts on the egg laying environment for sea turtles.