16 Rural Communes Health and Children Care Program

Although most communes have a health clinic or a policlinic (which covers inter-commune areas) in the Central Region, people living in rural areas are chronically suffering from epidemic diseases, high prevalence of malnutrition among infants is at an alarming level, and the population is increasing at a higher rate as compared to the national average. The program is aimed at improving and strengthening the levels of public health care, family planning, and nutrition for children in the selected rural communes in the Central Region. The program covers the improvement of health clinics in terms of facilities, medical equipment, and medicines, and the strengthening of the remote-area distribution systems of health services, family planning guidance, and education of nutrition to housewives. The implementation of the program will be assisted by appropriate organizations in Viet Nam and foreign NGOs as well.

- Implementation Agency : CRDC / Provinces

17 Integrated Vocational Education Center Project

In order to foster the regional industrialization and modernization, emphasis will be placed on human resource development underlining the vocational education that covers the field of manufacturing, agriculture and forestry, business and commerce, and so on. An Integrated Vocational Education Center (IVEC) will be established in Da Nang, which will provide vocational education to high school level students as well as provide pre- and in-service teacher training for vocational education. Study courses may include those for technical course, agriculture and forestry, and commerce and business. The IVEC project consists of providing necessary facilities and equipment, and a fellowship program to dispatch teaching staff to study and upgrade their capabilities in appropriate foreign countries.

- Implementation Agency : Ministry of Education & Training

6.3 SELECTION OF SIX PRIORITY PROJECTS AND PROGRAMS

6.3.1 Translation of Development Scenarios and Objectives into Projects and Programs

Obviously, priority should be given to such projects and programs as considered to be most responsive to achieve the established goals and objectives. Summarizing the goals and objectives as well as the basic development scenario described in the previous chapters, Figure 6.3.1, Figure 6.3.2, and Figure 6.3.3 demonstrate the conceptual relationship between the goals and proposed projects / programs.

6.3.2 Basic Development Strategy

The proposed projects and programs are prioritized taking into consideration the basic development strategy as illustrated in Figure 6.3.4. They are as follows.

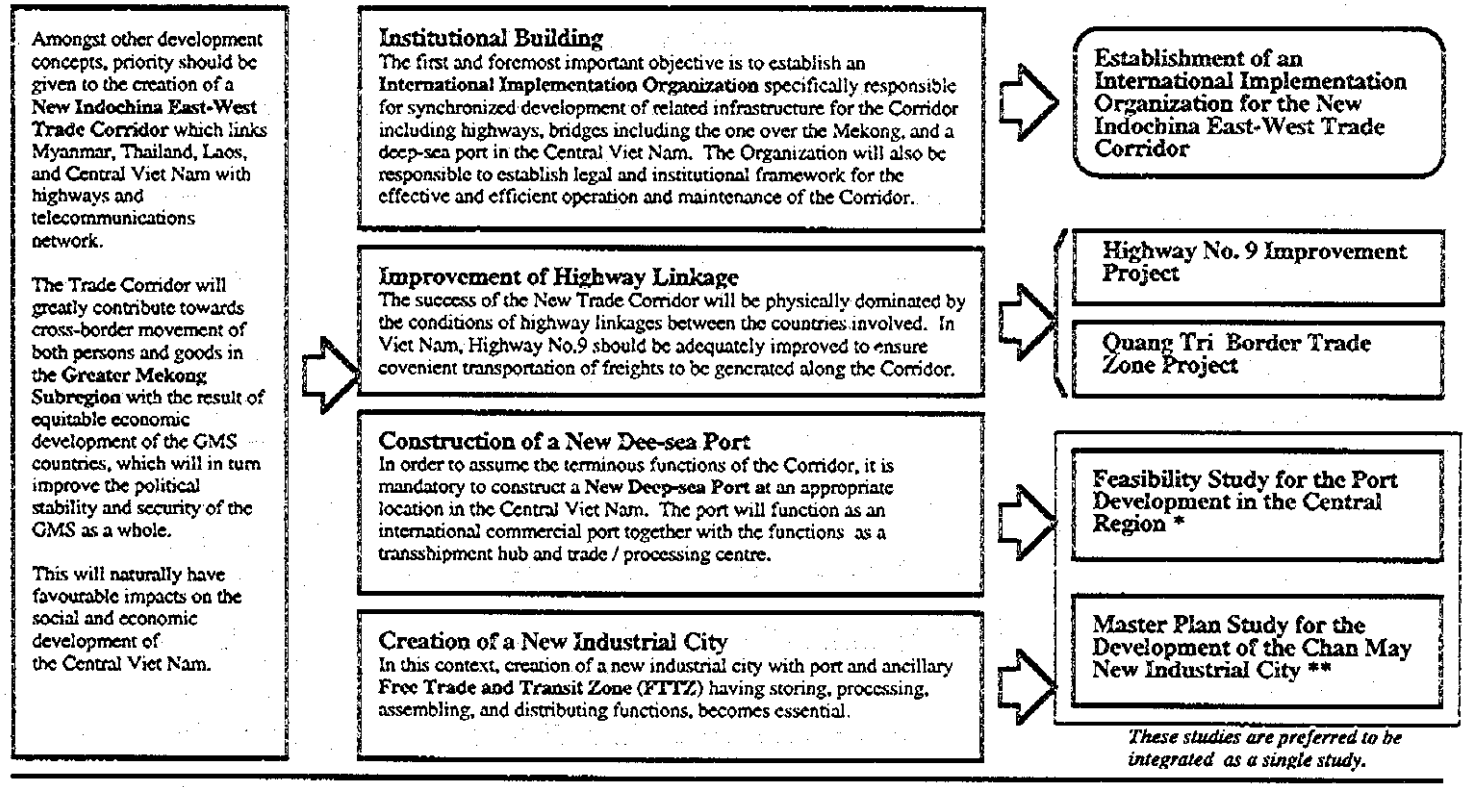
(a) Accelerated Regional Economic Growth by Inducing Industrial Sector

(b) Building Solid Regional Economic Foundation by Enhancing Agricultural Productivity Underlining Industrial Crops Production

(c) Quicker Return of Development Effects by Encouraging Regional Tourism Industry

Figure 6.3.1 Goal 1

DEVELOPMENT GOAL ONE	CONTRIBUTION TO THE POLITICAL STABILITY AND ECONOMIC DEVELOPMENT OF THE GREATER MEKONG SUBREGION (GMS)



Notes: * The Feasibility Study should cover existing and new ports development in the Central Region including Dung Quat, Tien Sa, Lien Chieu, Chan May, and Chua Viet, giving priority consideration to the Chan May Port in relation with the New Indochin East-West Trade Corridor.

** The Master Plan should include the development of a Free Trade and Transit Zone and other urban functions as required to develop a new industrial city in the Chan May area having international standards and nucleus business functions.

Figure 6.3.2 Goal 2

DEVELOPMENT GOAL TWO	ACHIEVEMENT OF THE ACCELERATED ECONOMIC GROWTH OF THE CENTRAL REGION FOR THE UNIFICATION OF THE NATION COUNTRY

SCENARIO

The agriculture-dominated existing industrial structure should be reshaped by placing much more emphasis on the **industrial and tourism sectors**, whilst enhancing the agricutural sector productivity by encouraging **industrial / cash crops farming** in highland areas.

Functional integration of the Central Region by achieving reasonable **spatial assignment of industries** among provinces and by strengthening inter-provincial linkages and the linkages between urban and rural areas.

Formulation of **urban agglomeration and resultant regional consumer market** by integrating two regional nucleus cities, which are Da Nang and Hue, to assume the central functions for the development of the Central Region

OBJECTIVES

Manufacturing Industry : Creation of critical mass in Dung Quat as an integrated industrial complex, and activiation of indigenous industries by institutional and financial supports by the Government.

Tourism Industry : By making the best use of natural, historical, and cultural endowments, the Hue-Da Nang Tourism Corridor will be developed as major tourism destinations in the Central Region.

Industrial / Cash Crops Farming : In consideration of the limited availability of rice paddy in low plain and the importance of rehabilitation of forestry in highland, industrial / cash crops farming will be developed, involving the people living in the mountainous areas.

Improvement of Road Netwrok : Improvement of extremely inadequate local roads will serve as a basis of the regional economic activities. Hue and Da Nang should be closely linked with a high standard highway to function as an integrated metropolitan area.

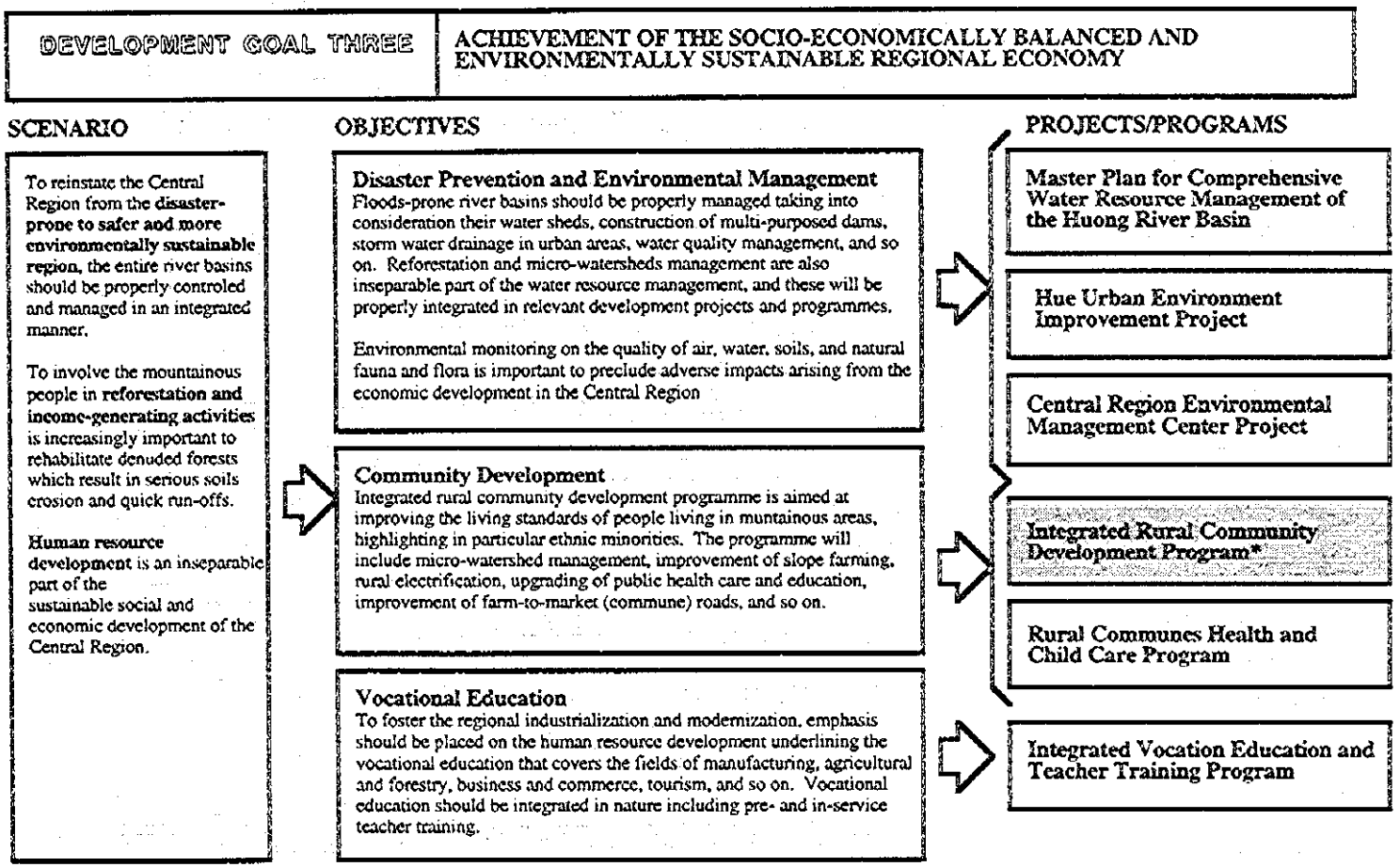
Development of a New Industrial City in Chan May : In addition to the terminous functions of the New Indochinca Trade Corridor, this will possibly provide best incentives to form the Hue-Da Nang Metropolitan Area.

PROJECTS/PROGRAMS

- Dung Quat Industrial Development Project
- Tourism Infrastructure Improvement and Tourism Promotion Zone (TPZ) Development Project
- Da Nang International Airport Improvement Project
- Highland Industrial Crops and Reforestation Promotion Program
- Medium & Small Scale Dam Project
- Secondary Road Improvement Project
- Hue-Da Nang Inter-city Highway Construction Project
- *Feasibility Study for the Port Development in the Central Region**
- *Master Plan Study for the Development of the Chan May New Industrial City**

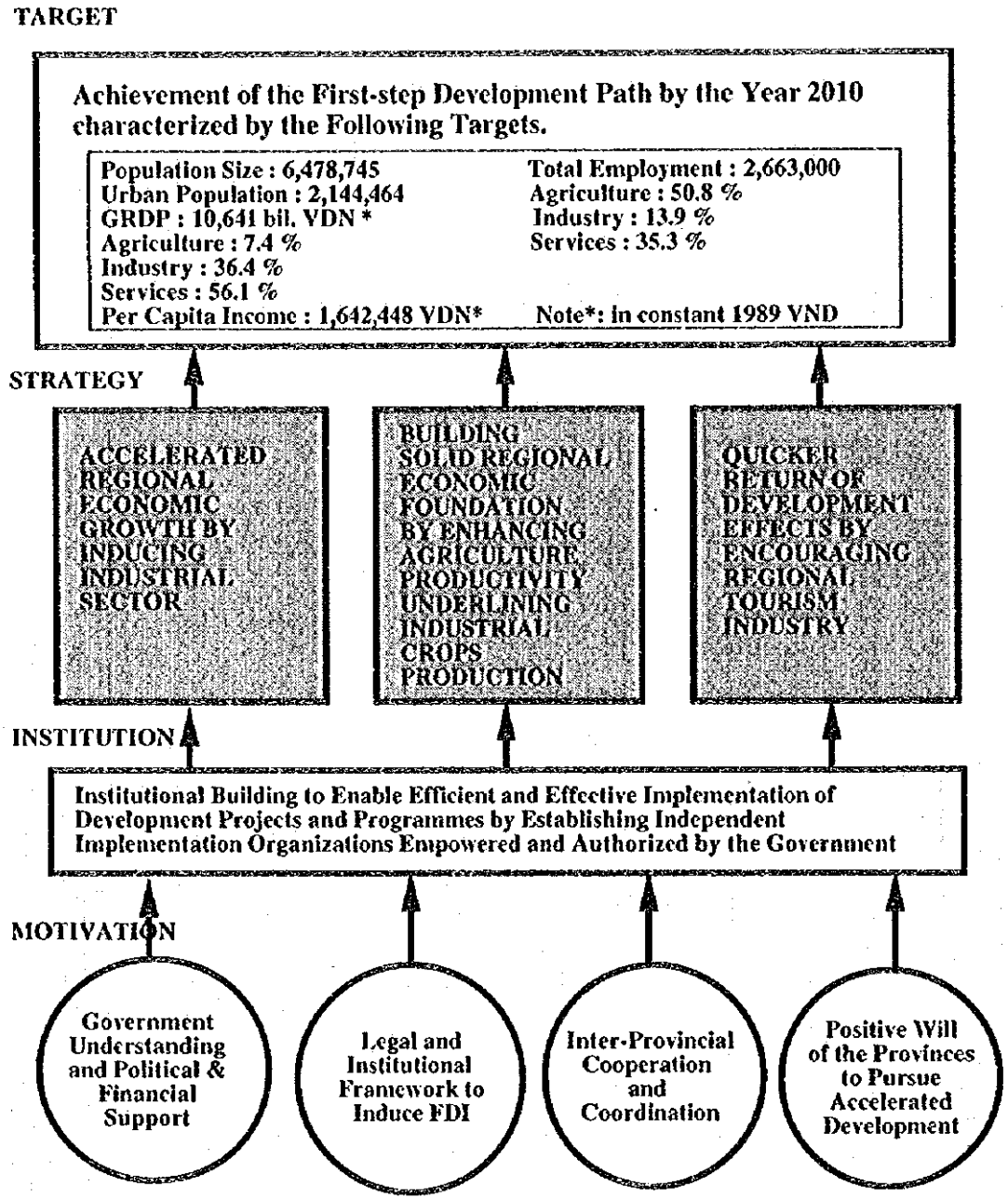
Notes: * These studies are selected not only to achieve **DEVELOPMENT GOAL ONE** but also to strongly induce to realise the Hue-Da Nang Metropolitan concept which is considered to be an important scenario to achieve **DEVELOPMENT GOAL TWO.**

Figure 6.3.3 Goal 3



Notes: * This is an pilot program to be initiated in the study area, and the program will be adjusted during the course of its implementation. Upon confirming its effectiveness, similar programs will be applied to other highland areas.

Figure 6.3.4 Basic Development Strategy



The concepts adopted in formulating the strategies are as follows.

(a) In order to achieve the high target growth rates of GRDP (10.52% by 2000, 16.13% by 2005, 17.23% by 2010), it is essential to strengthen the industrial and service sectors, since the agricultural sector growth cannot stand at such a high rate due to its inherent characteristics associated with various constraining factors in the Central Region. Also, the service sector growth is normally much dominated by the growth of industrial sector. Therefore, the compound growth should be geared by the industrial sector that chiefly consists of construction and manufacturing sub-sectors.

(b) Nevertheless, reasonable growth of the agricultural sector is mandatory to achieve a balanced and equitable development in the Central Region in that it would remain as the principal sector to absorb the outstanding rural employment (71.3% in 2000, 67.0% in 2005, and 61.6% in 2010), and to secure food sufficiency in the Central Region. Taking into consideration the terrain characteristics of the Central Region, enhancement of rice production in low land is rather limited chiefly due to lack of land availability, and industrial/cash crops production in highland should be encouraged due to abundant availability of unused land. Also, highland industrial/cash crops production is expected to contribute to the rehabilitation of the forest reserve which has been vastly denuded in the Central Region.

(c) The Central Region is obviously endowed with a variety of tourism resources including natural and historical resources, coupled with its convenient location surrounded by neighboring potential tourist markets (Thailand, Malaysia, China, Hong Kong, Japan, etc.). Tourism industry greatly contribute to the regional economy with less investment in terms of producing employment opportunities and creating various ripple effects on local industries. The Central Region should take advantage of its abundant tourism resources to put itself on the right development path as quickly as possible.

Taking into consideration the basic development strategy and other relevant factors as descried below, six priority projects and programs are selected in a "qualitative way", since "quantitative methods" are impractical in that quantification of comparative development effects is neither possible nor meaningful when comparing relative superiority of different sector projects. Figure 6.3.5 indicates the "compatibility" of selected projects and programs with the factors taken into consideration in the qualitative selection process. All the selected projects and programs have more than 4 linkages with the factors expected to be achieved by their implementation.

(a) Contribution to Accelerated Regional Economic Growth

(b) Consistency with National Policy

(c) Quicker Return of Development Effects and Greater Ripple Effects on Regional Economy

(d) Building Solid Foundation of the Regional Economy in Mid and Long Term

(e) Balanced and Equitable Development of the Central Region

(f) Preparation for Participation in Liberalized International Economy

(g) Support for Social Development in the Central Region

Also, attempts were made to evaluate the comparative priority of the proposed projects and programs adopting different weighting methods of "growth-oriented" (Table 6.3.1) and "distribution-oriented" (Table 6.3.2).

Figure 6.3.5 Factors Considered for Selection

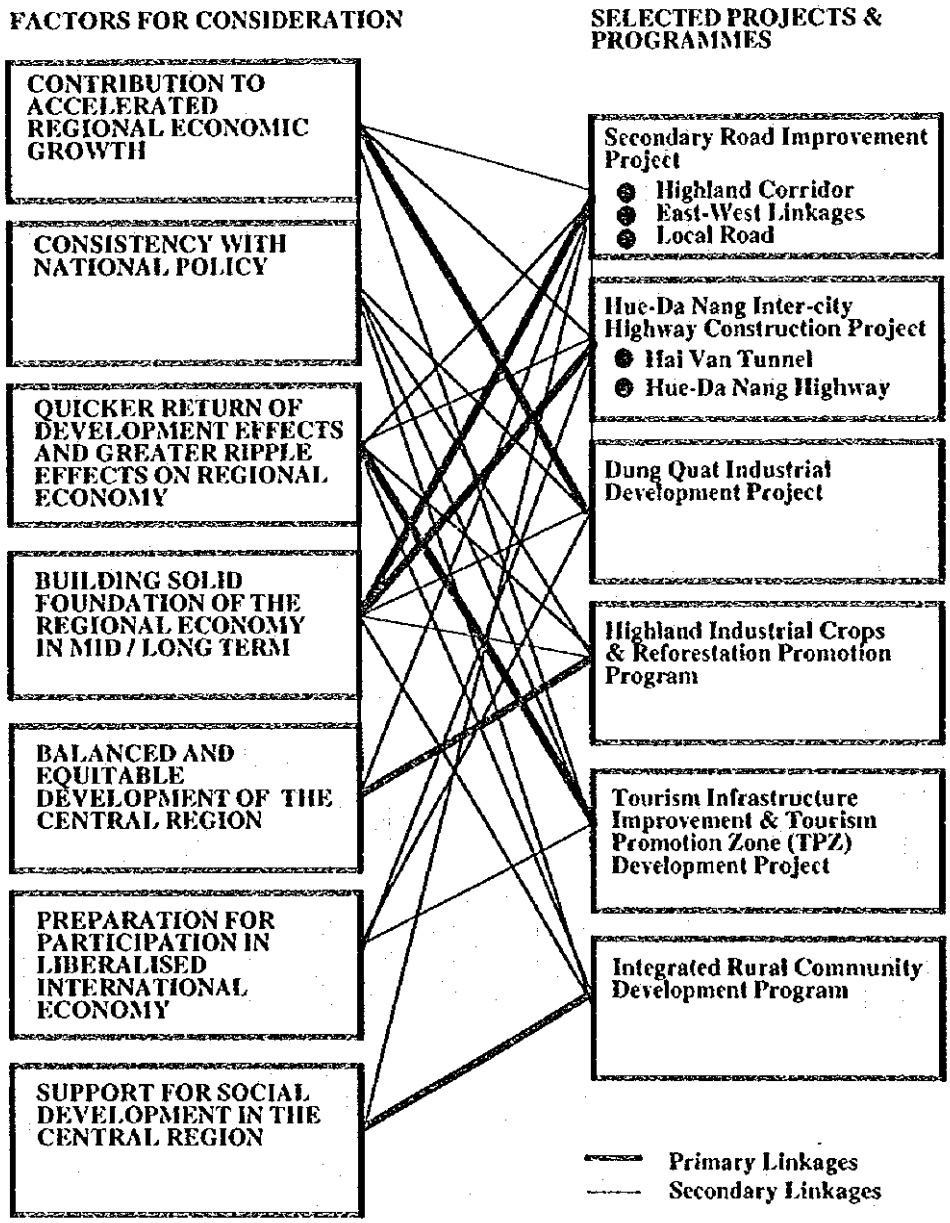


Table 6.3.1 Comparative Priority (A)

Item 1: Contribution to accelerated economy
Item 2: Consistency with national policy
Item 3: Quicker return of effects & greater ripple effects
Item 4: Building solid regional foundation
Item 5: Balanced development
Item 6: Preparation for economic liberalization
Item 7: Support for social development

Project and Programme	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Total
Growth-Oriented Weighting	3	1	2	1.5	1	1	0.5	10
(01) Highway No. 9 Improvement Project	12	4	8	6	3	5	1	39
(02) Quang Tri Border Trade Zone Project	9	2	4	4.5	2	4	1	26.5
(03) Dung Quat industrial Development Project	15	5	8	7.5	3	4	1	43.5
(04) Tourism Infrastructure Improvement & TPZ Development Project	15	4	10	6	4	4	2	45
(05) Da Nang International Airport Improvement Project	9	2	6	6	3	4	1	31
(06) Highland Industrial Crops & Reforestation Promotion Project	12	4	4	7.5	4	3	2	36.5
(07) Medium & Small Scale Dam Construction Project	6	3	4	6	4	2	2	27
(08) Secondary Road Improvement Project	12	3	6	7.5	4	3	2.5	38
(09) Hue-Da Nang Inter-city Highway Project	15	3	8	7.5	3	4	1.5	42
(10) Port Development in the Central Region (regional commerial port)	15	3	4	6	3	4	1	36
(11) Chan May New Industrial City Development Project	12	4	8	6	2	5	1	38
(12) Comprehensive Water Resource Management of the Huong River Basin	6	3	4	6	4	3	2	28
(13) Hue Urban Environment Improvement Project	6	2	4	4.5	3	4	1.5	25
(14) Central Region Environmental Management Center Project	3	3	4	6	3	3	1.5	23.5
(15) Integrated Rural Community Development Project	6	4	4	6	5	2	2.5	29.5
(16) Rural Communes Health & Child Care Programme	3	3	4	4.5	3	3	2	22.5
(17) Integrated Vocational Education & Teacher Training Programme	6	3	6	6	4	4	2	31
Evaluation	Point: 5: Excellent 4: High 3: Moderate 2: Marginal 1: Little							
(01) Highway No. 9 Improvement Project	4	4	4	4	3	5	2	
(02) Quang Tri Border Trade Zone Project	3	2	2	3	2	4	2	
(03) Dung Quat industrial Development Project	5	5	4	5	3	4	2	
(04) Tourism Infrastructure Improvement & TPZ Development Project	5	4	5	4	4	4	4	
(05) Da Nang International Airport Improvement Project	3	2	3	4	3	4	2	
(06) Highland Industrial Crops & Reforestation Promotion Project	4	4	2	5	4	3	4	
(07) Medium & Small Scale Dam Construction Project	2	3	2	4	4	2	4	
(08) Secondary Road Improvement Project	4	3	3	5	4	3	5	
(09) Hue-Da Nang Inter-city Highway Project	5	3	4	5	3	4	3	
(10) Port Development in the Central Region (regional commerial port)	5	3	2	4	3	4	2	
(11) Chan May New Industrial City Development Project	4	4	4	4	2	5	2	
(12) Comprehensive Water Resource Management of the Huong River Basin	2	3	2	4	4	3	4	
(13) Hue Urban Environment Improvement Project	2	2	2	3	3	4	3	
(14) Central Region Environmental Management Center Project	1	3	2	4	3	3	3	
(15) Integrated Rural Community Development Project	2	4	2	4	5	2	5	
(16) Rural Communes Health & Child Care Programme	1	3	2	3	3	3	4	
(17) Integrated Vocational Education & Teacher Training Programme	2	3	3	4	4	4	4	

Table 6.3.2 Comparative Priority (B)

Item 1: Contribution to accelerated economy
Item 2: Consistency with national policy
Item 3: Quicker return of effects & greater ripple effects
Item 4: Building solid regional foundation
Item 5: Balanced development
Item 6: Preparation for economic liberalization
Item 7: Support for social development

Project and Programme	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Total
Distribution-Oriented Weighting	**1**	**1**	**1**	**2**	**2**	**1**	**2**	**10**
(01) Highway No. 9 Improvement Project	4	4	4	8	6	5	4	35
(02) Quang Tri Border Trade Zone Project	3	2	2	6	4	4	4	25
(03) Dung Quat industrial Development Project	5	5	4	10	6	4	4	38
(04) Tourism Infrastructure Improvement & TPZ Development Project	5	4	5	8	8	4	8	42
(05) Da Nang International Airport Improvement Project	3	2	3	8	6	4	4	30
(06) Highland Industrial Crops & Reforestation Promotion Project	4	4	2	10	8	3	8	39
(07) Medium & Small Scale Dum Construction Project	2	3	2	8	8	2	8	33
(08) Secondary Road Improvement Project	4	3	3	10	8	3	10	41
(09) Hue-Da Nang Inter-city Highway Project	5	3	4	10	6	4	6	38
(10) Port Development in the Central Region (regional commerial port)	5	3	2	8	6	4	4	32
(11) Chan May New Industrial City Development Project	4	4	4	8	4	5	4	33
(12) Comprehensive Water Resource Management of the Huong River Basin	2	3	2	8	8	3	8	34
(13) Hue Urban Environment Improvement Project	2	2	2	6	6	4	6	28
(14) Central Region Environmental Management Center Project	1	3	2	8	6	3	6	29
(15) Integrated Rural Community Development Project	2	4	2	8	10	2	10	38
(16) Rural Communes Health & Child Care Programme	1	3	2	6	6	3	8	29
(17) Integrated Vocational Education & Teacher Training Programme	2	3	3	8	8	4	8	36
Evaluation	**Point: 5: Excellent 4: High 3: Moderate 2: Marginal 1: Little**							
(01) Highway No. 9 Improvement Project	4	4	4	4	3	5	2	
(02) Quang Tri Border Trade Zone Project	3	2	2	3	2	4	2	
(03) Dung Quat industrial Development Project	5	5	4	5	3	4	2	
(04) Tourism Infrastructure Improvement & TPZ Development Project	5	4	5	4	4	4	4	
(05) Da Nang International Airport Improvement Project	3	2	3	4	3	4	2	
(06) Highland Industrial Crops & Reforestation Promotion Project	4	4	2	5	4	3	4	
(07) Medium & Small Scale Dum Construction Project	2	3	2	4	4	2	4	
(08) Secondary Road Improvement Project	4	3	3	5	4	3	5	
(09) Hue-Da Nang Inter-city Highway Project	5	3	4	5	3	4	3	
(10) Port Development in the Central Region (regional commerial port)	5	3	2	4	3	4	2	
(11) Chan May New Industrial City Development Project	4	4	4	4	2	5	2	
(12) Comprehensive Water Resource Management of the Huong River Basin	2	3	2	4	4	3	4	
(13) Hue Urban Environment Improvement Project	2	2	2	3	3	4	3	
(14) Central Region Environmental Management Center Project	1	3	2	4	3	3	3	
(15) Integrated Rural Community Development Project	2	4	2	4	5	2	5	
(16) Rural Communes Health & Child Care Programme	1	3	2	3	3	3	4	
(17) Integrated Vocational Education & Teacher Training Programme	2	3	3	4	4	4	4	

CHAPTER 7

PRELIMINARY FEASIBILITY STUDY FOR SELECTED PRIORITY PROJECTS AND PROGRAMS

CHAPTER 7

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7.1 HIGHLAND INDUSTRIAL CROPS AND REFORESTATION PROMOTION PROGRAM (HIC)

7.1.1 Scope of the Program

Industrial crops in Viet Nam have been recognized among the most promising agricultural commodities especially for exports, because the quality and supplying capacity to the international commodity market are gradually approved by those who handle international business. The study area does not necessarily satisfy the full requirement to develop industrial crops, but actually there is no alternative that can realize greater leap from the present meager output level of food and other crops to enough viable one for the sustenance of agriculture as well as for better purchasing power of farmers to consume industrial products manufactured in the planned industrial areas.

Out of the two major agricultural zones, flat plains and hilly and mountainous zone, the latter has larger room in future development with land availability for crop diversification. Coming era will demand not only food security but rural income source that provides rural population with healthy level of standard living and purchasing power to buy the products of indigenous industries so that created industrial sector within the area can be partly supported by the inhabitants themselves. The reason why priority is attached to the latter lies in the advantages of planting industrial crops therein that can supply materials to processing industries which in turn may create job opportunities for local population. The processing industries should be established within the producing areas otherwise transport costs of bulky materials aggravate profitability of processing.

A tentative goal can be set in a way that local population living in hilly and mountainous areas will enable to earn as much as those living in urban areas in the same region. The concrete objectives of the proposed program include; rational crop plantation plans for individual farm household, provision of effective ways of technical transfer and diffusion among industrial crop growers, and of access to capital and financial sources. As a matter of course, provision or improvement of processing and marketing systems should be simultaneously addressed in industrial or infrastructure sector to make the whole process complete. The proposed program will bring a healthy result of narcotic eradication, because the revenue from industrial crops often outweighs illegal income from isolated cocaine heroin, or opium production. Not only Viet Nam but donor countries can benefit from this result. In this connection, projects have been already launched by U.N.D.C.P., etc.

Fortunately, Viet Nam's exports of tree crop commodities enjoy steady expansion, *inter alia*, those of coffee and rubber experienced favorable and remarkable development. Future tasks still remain in establishing own brand with more value-added types or in offering finished products through manual skill, since they have higher margin and ample labor resource can be converted into foreign currencies.

7.1.2 National and Provincial Strategy and Policies towards Industrial Crops

MARD has kept the forwarding stance for the development of industrial crops and attaches special importance to sugar, coffee, tea, rubber, silk, exportable vegetables and meats as priority area for the expansion towards 2000 and 2010, to materialize the annual production

target of one million tons of sugar by 2000. Sugarcane is to be grown on 280 thousand ha, or expanded by 25 % from 1995 acreage. The target of tea garden is set at 100 thousand ha, or increased by 50 % from it. Acreage under coffee will augment to 200 thousand ha, the growth of around 8 % from 1995 acreage to fulfill the annual export target of 240 thousand tons. Rubber plantation area reaches 400 thousand ha, a 44 % increase from 1995 acreage to extract annually dried latex of 200 thousand tons. As to silk production, an ambitious target is set at 70 thousand ha of mulberry field, 3.2 times as much as current acreage to enhance silk industries for export. Besides, MARD orients to expand processing industries for these crops by facilitating new mill construction and extension of current capacity to accommodate larger supply of materials. It envisages 27 sugar refineries under construction, renovation of tea processing plants of tea, two modern coffee processing factories equipped with instant coffee manufacturing so that annual processing capacity can be expanded at the rate of 50 to 100 thousand tons of green coffee, five new latex processing plants put into operation with the upgrading of existing plants, and silk weaving and printing mills to manufacture export textile.

Provincial agricultural development policies also stress the priority given to industrial crops not only because of the enhanced national campaign but also various environmental, political and economic situations surrounding them. Agro-industry has become one of the leading job suppliers for inhabitants in and around the urban area in the study area, because agricultural sector supplies material for the processing industry sector but other primary industries fail to supply substantial materials to their manufacturing sectors. A subsector of food production would be the most important one, but at best it can fill only the stomach of producers and other inhabitants, least creating chain business nor job opportunities, or least expanding capacity of tax payment dedicated to income source of provinces concerned.

On the contrary, industrial crops presently bring higher return to producer-farmers than food crops do, contributing to job creation in rural area, paying higher amount of tax to the government. Moreover, a number of privatized processing enterprises, to which the investment for processing equipment was made, wait for processing materials, and if the delivery happens to fail, machinery would get idle or they would be blamed for over-investment. Some of the cadres of these enterprises are late officials who are to take responsibility for amortization of invested capitals. Due to such immediate circumstances, each province is obliged to promote industrial crops regardless of whether they are remunerative, profitable or economically viable or not. However, according to the estimation by the study team, all the crops chosen in this program, except for forestry products, have shown positive economic return within the period of program implementation, hence it is worthwhile to promote the future expansion for these crops. Yet, risk of any speculative crops cannot be nullified however the producers make it a try to get rid of, so all the four provinces now make their best effort to create a robust crop industries in their jurisdiction in an attempt to minimize the risks caused by improper varietal selection, unsuitable application of husbandry techniques, post-harvest treatments, marketing logistics and so on.

7.1.3 Strategy for Challenging Current Constraints

In deploying industrial crops development in hilly and mountainous areas, a firm strategy is essential that must take account of their advantages and disadvantages, various prerequisites for their plantation such as techniques, labor supply and other input supply, post-harvest practices, marketing and processing and international market situation.

Table 7.1.1 indicates various features of the industrial crops that are employed as the components in this program. The most important feature common to tree crops lies in long gestation periods, the difficulty of switching into other species once a particular species is planted. Another commonly found character among them is that the producing area is adjacent to the processing units, or their construction is necessary to develop them.

Among other characteristics, it should be noted that some tree crops require shading trees (cacao), mother trees like jackfruit tree (pepper), windbreak forest (rubber and desirably coffee, tea and cacao) so that plantation field can be protected from wind in the leeway.

In addition to such requirements needed for plantation, maintenance and tending of immature garden have to be counted in the budget of crop production. The total cost of developing industrial crop plantation will amount to the level that is beyond individual investment ability.

In short, just as found in other agricultural subsectors, producers face lack of investment capital and modern techniques and knowledge on crop husbandry, post-harvesting and marketing as well as lack of structure for the industry encompassing from formation of production groups to collective post-harvest operation and marketing of material products and of know-how to better utilize by-products. Small-holdingness, or too narrow holding of farm land per household is common feature throughout Viet Nam, but particularly outstanding in this area. Any industrial crops have their international markets, where cheap labor force and scale merit determine their competitiveness. The area can meet the former all right, but a special tactic is needed to satisfy the latter, that is group farming without any comparable measure to solve:

Table 7.1.1 Features of Selected Industrial Crops

Crop / Feature	Gestation Period	Product Storability	Plantation Cost	Profitability/Risk	Labor Demand
Coffee Arabica	2 - 3	short, home drying	highest	highly variable	medium
Coffee Robusta	4 - 5	short, home drying	medium - high	less profitable	low-medium
Rubber	7 - 8	immediate delivery	fairly high	relatively stable	intensive
Pepper	3 - 4	short -medium	highest	slump in demand	medium
Tea	1 - 2	immediate delivery	medium	relatively stable	intensive
Cashewnut	5 - 6	medium	cheap - medium	slump in price	low-medium
Cinnamon	8 - 9	medium - durable	cheap	stable	low-medium
Cocoa	3 - 4	short -medium	highest	relatively stable	medium
Mulberry / Silk	0 - 1	home consumption	medium	slump in price	intensive
Sugarcane	0	short, fast delivery	cheap - medium	less profitable	intensive

Crop / Feature	Economic Life	Irrigation Demand	Soil Requirement	Climatic Preference	Skill Demand
Coffee Arabica	12 - 15	desirable +20%	basaltic best fit	cooler climate	high skill
Coffee Robusta	15 - 20	facultative	basaltic best fit	broader fitness	ordinary
Rubber	23 - 27	usually no need	stoneless RYsoil	tropical rain area	high skill
Pepper	15 - 20	desirable	basaltic best fit	warm and humid	high skill
Tea	10 - 15	desirable	highly adaptable	cool and humid	medium
Cashewnut	15 - 25	desirable	highly adaptable	tropic monsoon	extensive
Cinnamon	20 - 25	usually no need	highly adaptable	tropical rain area	extensive
Cocoa	8 - 12	usually no need	basaltic best fit	tropical rain area	high-skill
Mulberry / Silk	5 - 10	desirable +20%	basaltic best fit	broader fitness	medium
Sugarcane	1 - 1.5	necessary	alluvial better fit	warm and humid	medium

Source : provided by the Study Team based on the hearing in the provinces concerned.

- Firstly, it is essential to select the core commodities among those already existing in the study area, because constraints and development tactics can be made clear from the past performance
- Secondly, tentative or short term targets should be focused on economizing initial investment while making full use of currently available resources, i.e., plentiful manpower to formulate labor-intensive way of production and processing, and
- Thirdly, the outline and contents of the proposed program are consistent with the up-dated government and provincial policies to be applied to mountainous and hilly areas in the study area. These three preconditions automatically limit the framework of the program and its components. With regard to afforestation and reforestation, it has fairly long gestation period before they contribute to the planters in a fruitful way, however, these activities should be evaluated from social and environmental aspects though the apparent economic value remains in much lower level than crop farming.

It should be reiterated here that most internationally traded agricultural commodities are subject to market-price fluctuations threatening too often producers' and exporters' survival, hence the development strategies desirably provide measures to withstand the detrimental impact to

vulnerable settlers in newly reclaimed areas in mountainous zone by sudden price drop as well as to support tree crop growers during a long gestation period after the initial investment.

7.1.4 Program Components

The proposed program comprises two aspects, viz. technical assistance and financial credit funds for tree plant growers and their associations. It is important to note that Vietnamese Government and provincial people's committees have quite limited sources of budgetary revenue that make the maintenance of state or province owned facilities quite difficult. In case of facility donation, running/maintenance of the donated facility should also be supplied from the donor for a decade or two, otherwise it will sooner or later be left unused, unless the facility itself can earn enough amount of the recurrent cost. In so far as commodity projects are concerned, usual form of overseas assistance is mostly confined to soft term loans, except for technical transfer without facility.

The proposed program consists of three components, namely analysis of crop potential and market outlook, technical set-up and transfer to producing households and provision of long term loans for planting, husbandry and reforestation of production forest by them.

1) Crop Analysis for Pursuing Cost Effectiveness

The first component as stated above is evidently essential for realizing a loan project which requires cost effectiveness or justification of industrial crop plantation. Most of industrial crops bear either export-oriented or export substitution character, so their success depends heavily on future international market demand/supply situations, quality and forms of exportable products or yield levels, speed of tree maturity and levels of production/marketing costs. Feasibility of employing an industrial crop in the study area will be determined through these analyses, otherwise risk would be greater if random adoption is made. The comprehensive crop analysis should be made in the study area, instead of Ha Noi or Ho Chi Minh, where a part of data that can be input into the analysis has been already accumulated, and the staff with ample experiences of site surveys within the study area is also available. As for the concrete place, The Hue University of Agriculture is recommendable to perform this analysis because it has both data and staff eligible for performing it.

2) Technical Transfer to Small Scale Producers

The second component has three alternatives, i.e., establishing a farmer training center, a fortification of existing extension network and entrusting it to processing enterprises. The former may be the most popular means to offer technical transfer and training for the producers, but it has many shortcoming, as well. First of all, it requires fairly amount of building costs, but even if they are met by donors, very few of them can also provide running costs for a decade or two after it is handed over to central or local government. Are they able to maintain it without collecting fee from users? Can trainees afford to pay for training costs and willing to participate in the training courses living at a dormitory? If it is managed under a province, can trainees from other provinces participate in the training without any maintenance cost allocation among user provinces? The costs for a training center can be alternatively utilized to strengthen currently running extension service. As discussed in institution building and human resource development, training centers too often suffer from low level utilization due to lack of adequate instruction staff, lack of spareparts delivery, budgetary limitation for buying fuel, material, for paying salary, etc. Presently majority of industrial crop producers can only rely on verbal communication from neighborhood, stealing skill by watching what neighbors do, because they never have chance to learn the techniques from experts or instructors.

An alternative of training center is brushing-up of extension wing. If specialized extension workers to industrial crops are provided with their deep experiences and know-how, their techniques can be diffused among industrial crop growers. In this case, financial support is

needed to train workers up to the required level, to equip them with materials and means of visiting producing areas and extend their activities. It takes a couple of years to provide qualified workers with full expertise, and the diffusion activity requires such running costs as fuel, for motorcycles, audio-visual sets, seedlings, etc. In this case, the existing training service in the Institute of Agricultural Science in South Viet Nam in HCMC and universities in Ha Noi and HCMC should be streamlined or expanded. As a World Bank report comments, hither-to functioning extension wing has now largely collapsed due to budgetary shortfalls and bureaucratic way of support services. So, it can never be relied on unless a radically renovated system is employed with up-dated technology.

Another alternative, which seems to be more practical, calls for the effort of processing enterprises dealing with industrial crops as their processing materials. Since they need to satisfy certain standard of quality and to procure required quantity of processing materials, they have to provide contracted farmers with minimum inputs and techniques through commercial routes. Actually, many industrial crop growers have received inputs and instructions from contracted enterprises in southern part of the study area. Typical cases thereof can be seen in sugarcane growers in Quang Ngai province. Not every enterprise but a few well-managed ones can offer such a complete package of input to growers. There are a host of poor settlers who planted industrial crops without any particular contract with processing units and they are apt to become suppliers to casually visiting middlemen/collectors who offer low unit price and make a good profit from them.

In conclusion, the second alternative does not have any serious difficulty and is in harmony with currently developing institution and structure. To realize rapid supply of specialists to be engaged in industrial crop promotion, a special in-service and post-graduate training course for converting mainly ordinary extension staff as paddy specialists into industrial crop ones (most probably at the sacrifice of number of workers for flat zone where paddy land predominates) and for training candidates for the replacement of retiring extension staff is proposed. The Hue University will call for the supply of such equipment (listed in Table) as technical cooperation by donor countries. A part of equipment for field training can be installed in the Agricultural College in Tam Ky (Q.N.D.N.) where test plots are available for the training and professors of Hue University actually instruct college students. The current agricultural extension system is briefed in Table 7.1.2.

Table 7.1.2 Provincial Extension Framework

Province	Quang Tri	T.T.Hue	Q.N.D.N.	Quang Ngai
Number of Prov. Staff	40	50	120	55
Foodcrop Specialist	33	43	101	45
Industrial Crop SP.	2	1	4	4
Livestock Specialist	5	7	15	6
number of staff /district	2 - 5	4 - 8	2 - 3	5 - 7
Number of District Office	8	9	16	11

Source : verbal hearing from each district

The provincial extension offices have 40 - 120 provincial extension staff, 2 - 8 district staff per district who station in district extension office, and 1 - 2 communal staff in each commune. Plant protection and veterinary are independent from extension, each section has 5 staff or so per district. Very few staff have expertise in special crops like industrial crops, only a few staff can deal with production and post-harvest techniques of industrial crops. Due to very limited means of extension, they can visit quite limited number of farm households that call for assistance from the staff. For example, motor bicycles held by the extension offices are not enough to offer to every staff and many of them use bicycle to do their duty. Each province has acute demand for strengthening industrial crop specialists as staff of local extension offices. Farmer's training courses are mainly provided for flat area (zone A). In the case of Q.N.D.N., the province provides farmers (25 farmers per course) with 5 - 7 day courses by 120 teaching staff (provincial and district extension staff), where direct paddy sowing system and driving skill of hand tractors, etc. are instructed. However, no industrial course has so far been provided.

3) Financial Leverage

Settlers in New Economic Zones has only a few humble immobile assets that have almost no value for serving security, or mortgage required to borrow resources from financial institutions. This is the reason why they have very limited accessible sources for further investment. They have allocated land that will meet the purpose for borrowing, but very few of them dare to apply to loan facility for fear of losing their only property.

The situation is also similar for ethnic minorities who possess almost no property of value except some livestock, which is essential for their daily life. They use vast waste land for practicing slash and burn cultivation, but the value of such bare land is negligible.

However, motivated by the tale of successful cases, some new settlers borrow funds from their relatives, parents or middlemen to reclaim the land allotted to them into coffee gardens, for arabica varieties have shorter gestation period until economic maturity reaches. However, they have to pay a heavy interest, very often the annual interest rate exceeds 30 % of the amount of capital they borrowed. This is equivalent to the financial internal rate of return at 30 % or more, but actually very few crops have such a high rate. This is really a risky adventure since they do not have experience, basic knowledge nor trustful route of outlet for their products that guarantees remunerative return to the producers. The absolute necessity of providing accessible investment fund for reclamation lies in this fact, for making the development more sustainable.

To make the matter worse, such ambitious settlers are too often straight-forward to create a complete mono-culture without spreading their risk into diversified crop selection. Their fortune will trail only two ways; to make a windfall profit or to lose all the property. This seems to be contradictory with the expected target of creating new economic zones, the stabilization of everyday life for sustainable settling and development.

7.1.5 Beneficiaries and Coverage of the Program

1) Beneficiaries of the Program

Agricultural zone B and zone C have room for expanding plantation under industrial crops where new economic zones and resettlement project areas for ethnic minorities are located. It follows that settlers and ethnic resettlers are the beneficiaries of the program.

Table 7.1.3 New Economic Zones in the Study Area

Unit : square meters per HH for the bottom two columns

Item of Statistics	Q.Tri	T.T.Hue	Q.N.D.N.	Q. Ngai	Study Area
Number of Zones in Province	11	9	10	13	43
of which mountainous	11	5	7	5	28
of which flat plain	0	4	3	6	13
of which island	0	0	0	2	2
Total Household (H.H.)	630	1,800	1,450	3,100	6,980
Total Population	3,450	9,927	7,800	14,103	35,280
Labor Force	1,805	3,466	3,289	7,808	16,368
Area Allocated as Forestland	1,682	2,190	11,963	27,012	42,847
Farmland Allotted to Settlers	1,985	5,400	6,963	15,500	29,848
Out of which Industrial Crop	1,670	4,500	6,750	14,468	27,388
Out of which Foodcrop Area	315	900	213	1,032	2,460

Note : Figures of the allocated area are only the estimation based on the data collected by interviews.

Construction of new economic zones were initiated after 1975, and now two decades have been passed since they were introduced. However, most settlers have not yet been well off owing to handicapped conditions in hilly and mountainous areas. Similarly, permanent settlement (or resettlement) of ethnic minorities who remove their houses from a place to another every four or five years accompanying with their habit of slash and burn (shifting cultivation) system have

been encouraged since mid 1980s in an effort to advise them to abstain from burning forest and to settle in a permanent way. Many groups of minorities appear to have successfully shifted from traditional migrant system to permanent way of residence, but still we can observe burning smoke and burnt patches of open forest in the mountains. Anyway, settlers and resettlers but nobody else who should restore rural economy by means of industrial crop cultivation. The distribution and population of new economic zones are listed in the following table. Some of the figures are not available in the provincial statistics but estimated by the study team. According to a farm interview result in some new economic zones, many immigrant households went back to their home villages because of shortage of means of livelihood or of natural calamities that deprived them of the base of daily life. If this tale is true, it appeals us of the acute needs of technical and financial assistance for their survival. It also implies that the remaining settlers are immune to various constraints or tolerant to hardship they have experienced so far, likely capable of developing new economic media like industrial crops only if they are accessible to resources of investment to them.

Table 7.1.4 indicates that the area reserved as industrial crop expansion accounts for only one third of the total target acreage to be expanded during 1996 2000, but new economic zones will be increased from now on and a part of the area allocated as forest plantation can be appropriated for tree crops like rubber, provided that the location is suitable for labor intensive land use or to favorable growth of seedlings. Although the new economic zones play major role in the development of tree crops, areas of ethnic minorities and rural areas in flat plains also take part in it.

2) Industrial Crops as Targets of Development by the Program

Industrial crops were introduced in this area during the French occupation period but all the old plantation were abandoned or destroyed mainly during the war. Sericulture is different from other crops, for it has been handed down from ancestors, however, such a hereditary technique is now disappearing as food shortage accelerated the conversion from mulberry field to acreage under food crops. Consequently, most economically active population do not fully master the techniques for industrial crop management.

Table 7.1.4 Industrial Tree Crop to be Employed in the Program

Item	Crop	Study Area	Q.Tri	T.T.Hue	QNDN	Q. Ngai
Current Crop	Coffee / Cocoa	2,500	1,400	0	0	1,100
Acreage in ha	Tea	1,300	0	200	1,000	100
	Rubber	6,200	5,400	0	0	800
	Cashew	3,400	0	0	200	3,200
	Mulberry	2,200	600	0	1,200	400
	Pepper	1,200	900	200	100	0
	Cinnamon	36,000	0	12,000	16,000	8,000
	Total Crop Area	52,800	8,300	12,400	18,500	13,600
Plantation	Coffee / Cocoa	13,000	3,000	0	0	10,000
Target	Tea	3,200	600	200	2,400	0
(1996 - 2000)	Rubber	23,000	15,000	6,000	0	2,000
	Cashew	8,700	0	0	4,000	4,700
	Mulberry	8,500	4,500	0	3,000	1,000
	Pepper	1,300	1,000	200	100	0
	Cinnamon	77,000	0	12,000	25,000	40,000
	Total Crop Area	134,700	24,100	18,400	34,500	57,700
Reclamation	Sugar cane	15,900	1,900	9,600	1,000	3,400
(1996 - 2000)	Rice Paddy Field	2,400	600	600	700	500

Source: JICA Study Team

Besides, these crops have been cultivated around the world as major international market commodities that are subject to incessant renovation in varieties, husbandry techniques and demand from importers and consumers. Unless their producers are fully acquainted with these situations, the level of international competitiveness would remain vulnerable, and they would fail to receive remunerative return from the international market. In order for them to catch up with the newest expertise indispensable for modern production, relevant supporting systems and producers' organizations should assist individual producers develop their fully competitive production base.

Species of industrial crops are selected as shown in the following table, taking account of the currently existing acreage, importance in the provincial agricultural plan, and suitability to the climatic and pedological conditions prevailing in the provinces. There are many other species of industrial crops in the study area that are not selected in this study, but most of them are cultivated in minor scale or not economically viable.

Among tree crops, cinnamon and rubber trees have the longest gestation period after transplanting at least seven years before economic harvesting begins. These trees also have the effect of forming vegetation canopy just as other forest trees, contributing much to watershed conservation limiting runoff of rainwater, thus preventing flood damage in down-stream areas. They can be used as timber when the plantation is regenerated. Ethnic minorities who have permanently settled already initiated planting of these trees in the light of these advantages even if they are subject to longer gestation before harvesting. In most cases, they are planted on the roadside, since it is convenient to gather labor force, and rubber plantation requires intensive labor input to collect latex every day or every other day.

Table 7.1.5 Industrial Crop Promotion in the Study Area

Province	Quang Tri	T.T.Hue	Q.N.Da Nang	Quang Ngai*	Study Area
1. Crop Specie and Expansion of Acreage by 2010 unit : ha					
Sugarcane	1,900	9,600	1,000	3,400	15,900
Mulberry Silk	3,900	-	1,800	600	6,300
Rubber	9,600	6,000	-	1,200	16,800
Pepper	100	0	0	-	100
Arabica Coffee	1,800	-	-	4,500	6,300
Robusta Coffee	- 200	-	-	-	- 200
Tea	600	0	1,400	- 100	1,900
Cocoa	-	-	-	4,400	4,400
Cinnamon	-	0	9,000	32,000	41,000
Cashewnut	-	-	3,800	1,500	5,300
Total Acreage	17,700	15,600	17,000	47,500	97,800
2. Extension Specialist Requirement by 2010 unit :person					
Diversification	1	2	1	2	6
Sericulture	2	0	2	1	5
Tree Protection	3	2	1	3	9
Spice Crop	0	0	2	2	4
Beverage Crop	2	0	1	2	5
Total Specialist	8	4	7	10	29
3. Loan Requirement to Develop the Above Shown Acreage unit : 1,000 US$					
Sugarcane	1,761	8,897	927	3,151	14,736
Mulberry Silk	3,436	-	1,586	529	5,551
Rubber	3,514	2,196	-	439	6,149
Pepper	120	0	0	-	120
Arabica Coffee	4,091	-	-	10,229	14,320
Tea	435	0	1,015	0	1,450
Cocoa	-	-	-	5,500	5,500
Cinnamon	-	0	2,925	10,400	13,325
Cashewnut	-	-	1,045	413	1,458
Total Acreage	13,357	11,093	7,498	30,661	62,609

7.1.6 Details of the Program

The proposed program plans technical transfer (crop analysis and formation of powerful extension wing for industrial crop development) and financial leverage, and the former can be carried out by utilizing the existing facility of Hue University and Da Nang Agricultural College. Professors of Hue University are responsible for lecturing and research in the College, where the space for installing equipment of in-service training course for extension workers and candidates is available. (Hue University is located in the center of Hue City and laboratory space is therefore too narrow to install equipment except computers and some audio-visual apparatus.) The equipment and other prerequisites for technical transfer is listed in Table 7.1.6.

1) Dispatch of Industrial Crop Experts from Time to Time

Experts from donor countries are required for efficient technical collaboration, and the delivery of equipment, informative crop data supply and timely technical transfer. For example, Japan has ample compilation of leading techniques for sericulture, sugar industry and agro-forestry in this field. Their dispatch to the study area (not covering all the period of program implementation but on an intermittent basis) will contribute to effective and sustainable development of this program. Two experts are proposed for this purpose, dispatched from the donor country with the assignment of 53 months each, costing around 2 million US$.

2) In-Service Training

In-service training is scheduled based on the assumption that the total number of industrial crop specialists should be increased at the sacrifice of those who are in charge of food crops (provincial budget for maintaining agricultural extension system cannot be readily augmented), and currently existing staff assigned as industrial crop specialists are also needed to brush up their expertise by re-training so that their service for technical transfer can meet requirement from farmers' side. The trainees are not confined to provincial extension officer, but most of district and commune level workers who actually take charge of disseminating industrial crop techniques among producer farmers are trained Accordingly, the total number of trainees exceeds 500 (the provincial level : 130, the district level : 120 and communal level : more than 250). A training course trains 30 trainees for 6 months (1 month for general crop physiology, 5 months for field training, covering about 5 different crops, or one month for one crop). The course is to be started from 1997 until 2005 covering 18 courses accommodating 540 trainees. When the scheduled completed in the end of 2005, 540 trainees cater for 135 thousand ha of the planned acreage under industrial crops in the study area, that is to say 250 ha per worker. This figure gives a good contrast to current status, only 11 specialists covering 55 thousand ha, or 5,000 ha per specialist, who has to contact with 20 thousand households of industrial crop producers to faithfully perform his duty.

3) Delivery of Equipment for In-Service Training

Equipment to be delivered to Hue University and Da Nang Agricultural College for use of in-service training of extension staff is listed in Table 7.1.6. Basically, equipment for field trials is to be delivered to Da Nang Agricultural College, while data processing and laboratory apparatus is supplied to Hue University. Detailed specification and numbers required should be decided according to the curricula of training courses by the dispatched consultancy experts from donor countries.

4) Establishment of Crop Price Insurance Loan

This loan should be applicable to the producers of particular crops with wide fluctuation in international markets, i.e., coffee, silk (mulberry) and rubber. About 24 thousand households are planned to plant these crops, who need the crop price insurance during the period of dumping price. They usually have burden of repayment for borrowed capital, estimated at 550 US$ per year per household, and require the annual minimum livelihood amounting 3 million VND, or 270 US$. Provided that international price of one of these commodities has hardship,

one third of the total amount of sustenance is required as the proposed fund in this occasion, say about 6.5 million US$.

7.1.7 Expected Improvement from the Proposed Program

1) Technical Aspect

Systematic improvement by in-service retraining of existing extension staff will enable them to instruct farmers more suitable and up-dated techniques so that the production may meet international demand, yields and quality of the products can be raised and eventual farm productivity can be ameliorated. The effect of fortified technical transfer can be expected in the following aspects; increased efficiency and higher response to input application, exploration or better utilization of untapped by-products, prevention of pests and diseases, elevated return rate per labor hour and minimizing waste of capital by more considerate and elaborate planning in land reclamation, crop selection and labor allocation. Presently most plantation do not have irrigation facility, but during dry period from early spring to summer soil moisture depletes in the area, where Laotian wind deprive soil surface of moisture. The effect of irrigation on arabica coffee brings yield increase by 25 % and that on senescent pepper derives yield increment by 20 %. It also contributes to the yield improvement for intercropped foodcrops by 40 - 50 % between the rows of young seedlings of tree crops. Introduction of appropriate type of agro-forestry and inter-cropping is another task that has not been widely proliferated by extension activities. Substantial economic advantage from inter-cropping is expected for intensive land use by tree crop planters, thus mitigating a part of hardship during the gestation period thereof. Well trained extension workers can disseminate industrial crop diversification which can spread price risk, avoid risk of pests or disease outbreak and economization of capital.

2) Financial Aspect

The program plans to introduce a long term loan financed from external fund suppliers that has relevant grace period according to crop species. Though each province has a long term plan to develop tree crops within its jurisdiction as an outlook in 2010, it is not able to fulfill the plan without procuring the financing resources to put it into operation, because the majority of settlers and ethnic minorities presently suffer from poverty.

Therefore, the effect of financial thrust may be the largest among the proposed industrial crop promotion components. In other words, the program would turn out to be useless without any concrete proposal on program financing, and even most part of extension improvement for better technical transfer would become fruitless effort. As to interest of the loan, a half of financial rate of return of planned crops is recommended as a reasonable range from the side of repayment. Another loan provided for the insurance of commodity price will realize a fully sustainable development of industrial crops because the provinces in the study area are not the leading industrial crop producers in Viet Nam but virtually minor ones that started planting later than principal producing provinces, beyond the reach of emergency financial leverage by the state. By this reason, smallholder producers in this area are particularly vulnerable to market instability.

Once recession or slump of commodity hits the world market, the grass root producers, in particular those who neglect crop diversification and bet risky monoculture of an industrial crop, would most probably suffer from heavy, serious loss and debt. This means the entire collapse of minor crop industries by heavier damages than that suffered by major ones.

7.1.8 Implementation Organization

The department of agriculture in four provinces take responsibility for the improvement of technical transfer or fortification of farmers' associations because it falls within the framework of existing public services. In the case of utilizing foreign funds for capital investment or for the establishment of insurance fund, the Agricultural Bank serves as intermediary agency to manage loans granted to industrial crop producers or processing enterprises. As regards the

technical transfer and in-service training, Hue University and Da Nang Agricultural College are to collaborate with Agricultural and Rural Development Department of four related provinces for the implementation.

Table 7.1.6 List of Equipment for In-Service Training

Unit: number, thousand US$

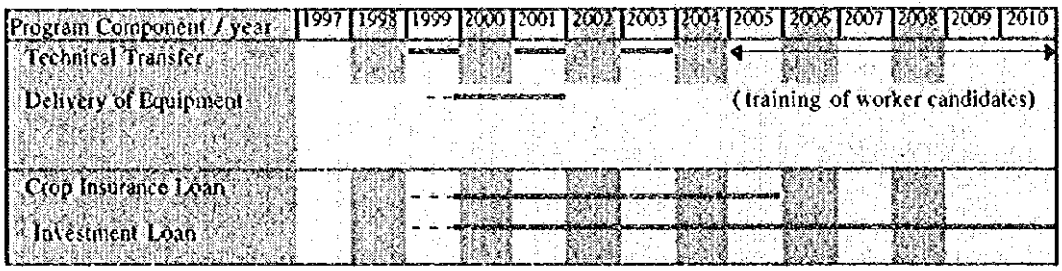
Equipment for In-Service Training	to College	to University	Amount on CIF base
1. Stationaries for Data Processing			
Computers and Printers	40	40	400
Copy Machine, Facsimile	5	15	75
2. Audio-Visual Apparatus			
Film / slide / Video Projector	2	3	600
Camera, 8 mm Camera	3	5	20
Screen and Audio-Mix Console	2	3	1,450
T.V. and Video Recorder, Monitor	3	5	25
Amplifier, Microphone Set	2	3	25
3. Miscellaneous Equipment, Expendable			
Cabinet	20	20	40
Office Desk	35	35	70
Floppy Disk, Film, Battery etc.	1	1	800
4. Laboratory Apparatus / Equipment			
Analytical Reagents	1	1	60
Fat Extraction & Analyzer	2	3	20
Soil Hand Auger and Test Kit	35	35	22
Red-Ox Meter	35	35	35
Water Distillator	2	3	10
Muffle Furnace	0	1	10
Amino Acid Analyzer	0	1	40
Gas Chromatography	0	1	65
Ultra Violet Spectrophotometer	0	1	35
Flame Spectrophotometer	0	1	25
pH meter	35	35	70
Centrifuger	10	5	38
Electric Incubator	10	0	800
Microtome	15	5	20
Saccharimeter	40	20	120
Binette Microscope	35	35	490
Grain / Bean Moisture Meter	35	35	420
Fiber Tension Measurement Kit	5	3	50
Analytical Balance	2	3	20
Weighing Balance, Metra	5	3	30
Refrigerator for seed and egg	5	5	40
Phyto-toron, metal frame	2	0	280
Semi-micro Kjeldal apparatus	5	5	750
5. Field Trial Equipment			
Drip Irrigation Equipment, Pump	1	0	9,400
Colgate Pipe	1	0	50
Trelice, Vinyl Sheet, Screen Net	1	0	30
Meteorological Apparatus	1	0	95
Land Survey Apparatus, T-Level	10	0	40
Back Hoe with spare-parts	2	0	80
Angle Dozer with Spareparts	2	0	220
Speed Sprayer with spareparts	2	0	70
Wheel Tractor and Trailer	5	0	200
6 Vehicles for Field Investigation	(Jeep)	(Mini-Bus)	
4-wheel Station Wagon /Minibus	2	2	260
250 cc Motorcycle	35	35	80
Total			17,480

Source: JICA Study Team

For smooth operation of in-service training and better management of equipment therefor, it is advised to establish inter-provincial liaison system, or better incorporate it into program management framework (CRDC). Advisory experts of industrial crops from donor countries station in CRDC in closer contact with instruction staff of the training courses for technical and information transfer.

7.1.9 Implementation Schedule

The Schedule of implementing the proposed program is shown in the following; the arrangement of technical transfer comes first in 1997 followed by the delivery of equipment in 1998, at the same time in-service training courses start from 1998 but those for candidates post-graduates of extension workers begins from 2005. Of the four items, disbursement of investment loan is carried out by AGRIBANK on a private business basis but the original fund ought to be borrowed from foreign financing sources.



Source: JICA Study Team

7.1.10 Cost and Benefit of the Program

1) Future Projection of Crop Production in the Study Area

The estimated acreage and production quantities are shown above in Table 7.1.5. As a matter of course, the existing tree standing and plantation acreage are excluded in the Table, and the total of the production including existing acreage is larger than that tabulated in Table 7.1.7. The estimated return from the selected industrial crop is shown in Table 7.1.8. As already stated, the initial investment of these crops is so huge that majority of settlers and resettlers cannot help hesitating to make up their mind to participate in reclamation, even if the loan is available to them. Actually however, manual labor wage accounts for by far major portion of reclamation as seen in table 7.1.6

Table 7.1.7 Reclamation Cost in Tan Lam Pepper Rehabilitation

Unit: man-day, US$ equivalent

Inputs for land reclamation	secondary Forest		Shrub Land		Grass land		Open Field	
listing only major items	number	Cost	Number	Cost	Number	Cost	Number	Cost
Labor under brushing	20	18	30	27				
felling (slash, burning)	50	45	5	5	2(20)	22		
isolation, burning etc.	12	11	10	9	2	2		
clearing around pit	18	16						
Required Labor in Total	112	102	55	50	34	31	5	5
Inputs cross-cut saw and ax set	1	10	1	7	1	3		
arboricide (litre)	0.25	2	0.25	2	0.1	10		
diesel fuel (litre)	5	1	2.5	1				
herbicide (litre)			3	19	6	38	2	13
Required Total Materials		21		37		49		
Total Land Reclamation Cost		123		88		80		25

Source : Courtesy of Tan Lam Pepper Enterprise, and Mr. Leichtmann, GTZ expert of Technical Cooperation

Table 7.1.8 Industrial Crop Yield Profile

Unit: ton / ha as fresh product/dried product

Year	Arabica Coffee	Robusta Coffee	Rubber	Cacao	Cinnamon	Cashew nut	Pepper	Tea	Mulberry	Sugar Cane
1	0	0	0	0	0	0	0	0	0/0	60/5.5
2	0	0	0	0	0	0	0	5.0/ 1.0	20/1.0	65/6.0
3	3.2 / 0.3	0	0	0	0	0	0	12.5/ 2.5	25/1.3	70/7.0
4	4.2 / 0.5	0	0	0	0	0.9/0.5	0.5 / 0.4	20.0/ 4.0	30/1.5	65/6.5
5	6.8 / 0.8	2.4/0.3	0	0.7/0.3	0	1.4/0.8	2.2 / 1.5	22.0/ 5.5	30/1.5	60/ 6.0
6	9.4 / 1.1	4.4/0.6	0	0.9/0.4	0	2.0/1.1	2.6 / 1.8	35.0/7.0	30/1,5	70/ 7.0
7	11.0/1.3	7.4/0.9	0.2/0.1	1.2/0.5	0	2.6/1.5	3.1 / 2.1	42.5/ 8.5	25/1.3	65/ 6.5
8	13.6/1.6	9.0/1.1	0.5/0.2	1.6/0.7	0	2.6/1.5	3.1 / 2.1	50.0/10.0	30/1.5	60/ 6.0
9	15.3/1.8	10.5 /1.3	0.7/0.2	1.9/0.8	0	2.8/1.6	3.1 / 2.1	55.0/11.0	30/1.5	70/7.0
10	15.3/1.8	11.5 /1.4	0.8/0.2	2.1/0.9	0.8/0.4	2.8/1.6	2.8 / 1.8	50.0/10.0	30/1,5	65/6.5
11	15.3/1.8	13.5 /1.6	1.0/0.3	1.9/0.8	0.8/0.4	2.8/1.6	2.2 / 1.6	42.5/ 8.5	25/1.3	60/ 6.0
12	12.8/1.5	15.0 /1.8	1.1/0.3	1.6/0.7	1.0/0.5	2.8/1.6	1.7 / 1.2	35.0/ 7.0	30/1.5	70/ 7.0
13	11.0/1.3	16.5 /1.9	1.2/0.4	1.6/0.7	1.0/0.5	2.6/1.5	1.5 / 1.1	30.0/ 6.0	30/1.5	65/ 6.5
14	10.2/1.2	16.5 /1.9	1.2/0.4	1.4/0.6	1.1/0.5	2.5/1.4	1.4 / 0.9	25.0/ 5.0	30/1,5	60/ 6.0
15	9.3 / 1.1	15.0 /1.8	1.3/0.4	1.1/0.5	1.1/0.6	2.3/1.3	1.3 / 0.8	10.0/ 4.0	25/1.3	70/7.0
16	8.5 / 1.0	13.5 /1.6	1.3/0.4	0.7/0.3	1.0/0.5	2.1/1.2	1.2 / 0.8	0.0/ 0.0	30/1.5	65/6.5
17	8.5 / 1.0	13.5 /1.6	1.3/0.4	0.9/0.4	0.5/0.3	2.1/1.2	1.1 / 0.7	5.0/ 1.0	30/1.5	60/ 6.0
18	7.7 / 0.9	12.0 /1.4	1.2/0.4	1.2/0.5	..0	1.9/1.1	1.1 / 0.7	12.5/ 2.5	30/1,5	70/ 7.0
19	7.7 / 0.9	11.0 /1.3	1.2/0.4	1.6/0.7	..0	1.9/1.1	1.0 / 0.7	20.0/ 4.0	25/1.3	65/ 6.5
20	6.8 / 0.8	10.0 /1.2	1.1/0.3	1.9/0.8	..0	1.8/1.0	0.9 / 0.6	22.0/ 5.5	30/1.5	60/ 6.0
21	6.8 / 0.8	9.0/1.1	1.0/0.3	2.1/0.9	..0	1.6/0.9	0.8 / 0.6	35.0/ 7.0	30/1.5	70/7.0
22	6.0 / 0.7	8.0/0.9	1.0/0.3	1.9/0.8	..0	1.4/0.8	0.7 / 0.5	42.5/ 8.5	30/1,5	65/6.5
23	6.0 / 0.7	7.5/0.9	0.9/0.3	1.6/0.7	..0	1.2/0.7	0.6 / 0.4	50.0/10.0	25/1.3	60/ 6.0
24	5.1 / 0.6	6.5/0.8	0.8/0.2	1.6/0.7	..0	1.1/0.6	0.5 / 0.4	55.0/11.0	30/1.5	70/7.0
25	5.0 / 0.6	6.0/0.7	0.7/0.2	1.4/0.6	4.4/2.2	0.9/0.5	0.4 / 0.3	50.0/10.0	30/1.5	65/6.5
Total	205 / 24.1	219 / 26.1	18.5/5.6	30.9/13.3	11.2/5.9	44.1 /25.1	33.8 / 22.1	750/149.5	680/34.3	1,625/ 163

Source : JICA Study Team

2) Net Benefit by Crop and Relative Profitability

Crop return and the production cost profile is presented in the following Table 7.1.9, that shows six out of ten crops have negative net return at current farm-gate price. This fact indirectly reflects present recession in international commodity price regime. Just because current net return indicates a negative value, it does not follow that they should always incur a loss to the producers. However, the extent of the red figure is worth paying attention. Negative rate of pepper is outstanding, and in fact a large acreage hitherto under it has been replanted into coffee and other crops by the plantation owners. The long term economic behavior of reforestation turns out to be positive, on the contrary, only because of favorable unit price of timber, though its gestation period extends over ten years until fuelwood can be collected from the planted site.

Though the holding size vary with place and crop, the average size should fall in the range 1.0 - 1.5 ha per household under crop in the hilly and mountainous area, where 65,200 to 97,800 farm households are engaged in industrial crop production. Then the average increment in annual return from industrial crop will come to 197 - 295 US$ per household in 2020 or later when the whole planting is completed and crops are matured for peak production. If farm tax is paid from this increment, 118 - 177 US$ per household can be collected by the State and the rest 79 to 118 US$ is left as net annual increment. This amount is comparable to the annual income level of the poorest stratum of living standard in rural areas, which is less than 300 US$, and this estimation tells us that industrial crops are not so profitable as expected. If this amount of increment should be obtained from paddy field in flat zone, increment in paddy yield should be 0.97 ton per ha, assuming that a household has 0.3 ha of rice field, while current trend in paddy yield is almost stagnant. From this fact, we could say that development of

industrial crop is a reasonable alternative so far as international market situation remains as stable as it does now.

Table 7.1.9 Crop Return and Production Cost

Unit: thousand US$ / ha

Crop Specie	Gross Return	Production Cost	Tax	Net Return	Return Rate
Sugarcane	3,276	3,173	328	103 (-225)	-6.9 %
Mulberry Cocoon	17,060	16,105	1,706	955 (-751)	-4.4 %
Rubber	8,317	4,964	832	3,353 (2,521)	30.3 %
Pepper	17,032	21,856	1,703	-4,824 (-6,527)	-38,3 %
Arabica Coffee	23,936	13,266	2,394	10,670 (8,276)	34.6%
Robusta Coffee	11,304	5,543	1,130	5,761 (4,631)	41.0 %
Tea	4,988	4,740	499	248 (-251)	-5.0 %
Cacao	5,440	5,091	544	349 (-.195)	-3.6 %
Cinnamon	9,664	7,698	966	1,966 (1,000)	10.4 %
Cashewnut	15,300	14,620	1,462	680 (-782)	-5.1 %
Tree Replantation	1,550	1,399	77*	228 (151)	9.7 %

Note : Figures in Brackets indicate real net return after deducing tax (set at 10 % or 5 %* of gross return)

Source : Estimated by the Study Team

7.2 INTEGRATED RURAL COMMUNITY DEVELOPMENT PROGRAM (RCD)

The Integrated Rural Community Development Program shall be aimed at the alleviation of poverty in all poor communes in the mountainous regions of ethnic minorities of the four target provinces. However, for the purposes of finding the best methods, twenty pilot projects shall be carried out during the pilot period until the year 2000 or 2001 in the selected areas. The selection of the project sites shall be made following the criterion set in the section 3.1.2, "Criterion for Site Selection", Pre-F/S Report Vol. 1 Part I.
Upon completion of the pilot projects, results shall be evaluated and necessary adjustments shall be made. Then, from the year 2001 to year 2010, the Program shall be expanded to include all poor communes of the mountainous regions of ethnic minorities of the four provinces, aiming at 70% of the people who are now classified as "poor" and "starving" emerge from these categories, and become independent of government subsidies.

7.2.1 Outline of the Program

Three sample communes have been selected based on the above criterion for the purpose of calculating approximate cost of the projects.

1) Selection of Sample Communes

In conformity with the criterion for the site selection, three sample communes in the District of Huong Hoa, Quang Tri Province have been selected. They are **Huong Tan Commune, Huong Phung Commune and Huc Commune**. The incomes of the all three communes are far below the national average, ethnic minorities are composing majorities of the population in the three communes and there are almost no notable industries in the District. Illiteracy rates in the three communes are considerably high. The provision of social infrastructure is very low and existing ones are in poor condition, but three communes are accessible by vehicle though road conditions are poor, so that some positive impacts of the projects can be expected. Furthermore, the local authorities and the commune people are earnestly eager to develop themselves and Chairmen of the Communes have good initiative.

2) Profile of the Selected Communes

The general profiles of the selected communes are as follows.

(1) Huong Tan Commune

Huong Tan Commune comprises 10 villages (or hamlets) of mostly Van Kieu ethnic minority. The total population of the commune is 1,618, of whom 780 persons are female. The total household number is 307. Average income per capita at the time of the study is about 35 US dollars, and 68% of the total households are classified as "poor." Of the total commune population , 40% of them between 6 to 45 years are illiterate.

Huong Tan Commune is located approximately 5 to 10 kilometers northwest of Khe Sanh, the District Town, along former national road 14B. Its surface area is 3,240 hectares, of which 2,100 ha is designated for forest, 470 ha for agriculture and the rest 670 ha are for other purposes. A large part of the Commune is hilly land and coffee and black pepper production is common.

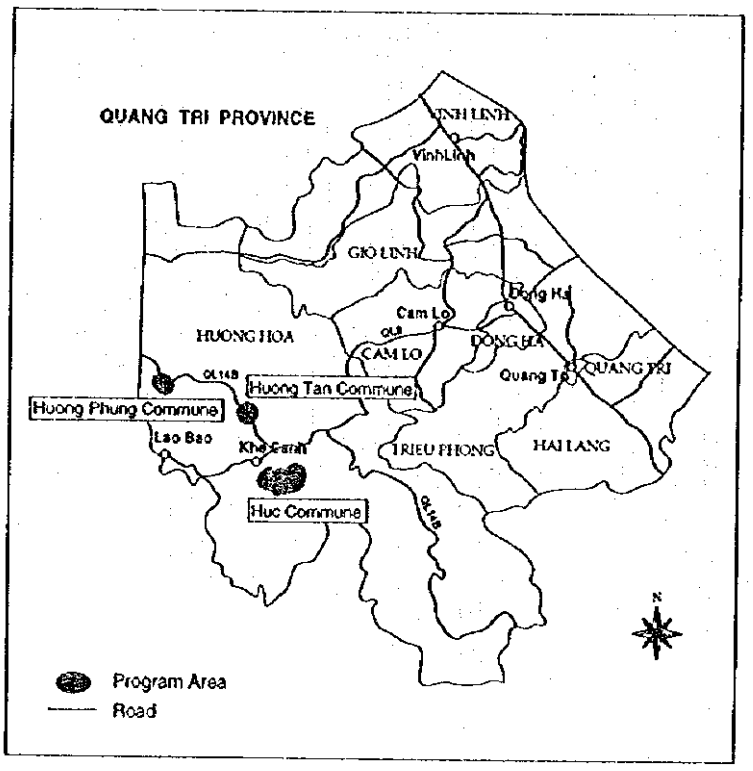
(2) Huong Phung Commune

Huong Phung Commune is consisted of 11 villages of mostly (80%) Van Kieu people. The total population of the commune is 1,348, of whom the female constitutes 598 persons. Average income per capita is about 34 US dollars and poor households count 67% of the total household. Nearly a half of the population are illiterate. The total household number is 322.

Huong Phung Commune is located further northwest of the Huong Tan Commune on the former national road 14B toward Lao border, about 30 kilometers from the District Town. The surface area of the Commune is 11,265 ha of which, agricultural land is 3,935 ha, forestry land 5,190 ha and the other use is 2,140 ha. Many small treeless mountains and hilly continue along the road.

There is a plan to plant 2,000 ha of coffee for this Commune in the near future.

Figure 7.2.1 Program Areas of Sample Communes



(3) Huc Commune

Huc Commune is located at approximately 12 kilometers southeast from the District Town. The surface area of Huc Commune occupies 6,620 ha, of which 785 ha is for agriculture, for 4,435 ha is for agriculture and the rest 1,400 ha is for other purposes.

The Commune is also composed of 10 villages. The total population of the Commune is 2,101, of whom 985 persons are female. The total household number is 388. Average income per capital of the Commune is 37 US dollars, and poverty rate is about 60%. Van Kieu people consists 99% of the population and 1% is Pa Co minority.

The terrain of the Huc Commune is the most difficult of three, very mountainous and though not impossible but access is hard.

3) Projects to be Implemented

The pilot projects to be implemented in the selected three Communes are as follows.

(1) Poverty Alleviation through Agricultural and Forestry Development

The projects for agricultural and forestry development shall be aimed at poverty alleviation and income generation. These shall be accompanied with financial assistance and provision of extension services.

Sub-projects consist of expansion of agricultural crops, land reclamation, provision of necessary agricultural inputs, construction or improvement of irrigation, improvement of animal husbandry, and projects for tree plantation, accompanied by the sub-projects for provision of credit loans and extension services.

(2) Provision of Social Infrastructure - Satisfaction of Basic Human Needs

The projects for construction and improvement of social infrastructure shall be accompanied by the provision of necessary equipment and materials.

Sub-projects are construction and improvement of commune roads and bridges; construction and improvement of primary schools, kindergartens and nursery schools; construction of health clinic and provision of equipment and medicines to clinics; provision of electricity to three Communes but to a limited degree, and digging of wells to all villages.

(3) Capacity Building

Capacity building projects shall involve various types of seminars, workshops and demonstration to strengthen people's ability to improve their life.

Sub-projects are "Community Development by Participatory Method", "Seminar and Training on Successful Use of Loan and Simple Bookkeeping," "Seminar, Training and Demonstration on Health", "Seminar, Demonstration and Training on Better Agriculture", and "Seminar Demonstration and Training on Simple Civil Engineering and Carpentry."

7.2.2 Project Component and Cost

1) Project Component

This Program shall be composed of three components: Poverty Alleviation through Agricultural and Forestry Development accompanied by financial assistance and provision of extension services; Provision of Social Infrastructure - Satisfaction of Basic Human Needs including Provision of Necessary Equipment, Materials and Medicines; and Capacity Building.

(1) Component for Poverty Alleviation through Agricultural and Forestry Development

This component requires the production expansion and provision of the necessary agricultural inputs. The following are the requirements submitted by each Commune as projects to be implemented. They should be understood as the requirements for nine (9) years, up to the year 2005. The feasibility of these sub-projects shall be discussed in the agricultural sector.

a) Project Component

Table 7.2.1 indicates the components of the poverty alleviation program for the three communes.

Table 7.2.1 Components of Poverty Alleviation Program

Item	Huong Tan (Beneficiaries: 307 households)	Huong Phung (Beneficiaries: 322 households)	Huc (Beneficiaries: 388 households)
AGRICULTURE			
• Expansion of agricultural crops			
- Coffee	400 ha	2,000 ha	800 ha
- Rice	250 ha	250 ha	300 ha
- Other annual crops	150 ha	200 ha	200 ha
• Land reclamation:	400 ha	2,000 ha	800 ha
• Necessary agricultural fertilizers:			
- Chemical fertilizers	2,000 tons	10,000 tons	4,000 tons
- Animal manure	24,000 tons	120,000 tons	18,000 tons
- Phospharate	3,200 tons	16,000 tons	6,100 tons
- Insecticide	4 tons	20 tons	8 tons
• Necessary seedlings:			
- Coffee and tea	2 million	10 million	4 million
- Windbreak trees	1 million	5 million	2 million
• Construction and improvement of irrigation:			
- Paddy and coffee	150 ha	70 ha	85 ha
- Improvement	25 ha	50 ha	0 ha
LIVESTOCK			
• Improvement of buffalo, cow, and pig	300 households	350 households	300 households
FORESTRY			
• Tree plantation: indigenous trees	2,100 ha (350 households)	5,190 ha (350 households)	-
• Seedlings for Tree plantation	-	-	5,190 ha

Source: JICA Study Team

b) Provision of Financial Assistance

The expansion of agricultural production base requires financial assistance. Because the conditions for qualifying households for loan set by the existing Viet Nam Bank for the Poor exclude the poorest households from receiving the loan, a special fund for the Program need to be set up by the government with softer conditions, for instance, to the Viet Nam Bank for the Poor through the Agricultural Bank. So that the poorest of the poor shall be also able to use bank loans.

c) Provision of Extension Services

Strong support of extension services for agriculture, forestry, animal husbandry and VAC is essential for the success of the program. The ability of the existing extension services cannot readily provide farmers with sufficient services. Strengthening of extension services and allocation of sufficient number of qualified service staff are the responsibility of the Ministry of Agriculture and Rural Development.

(2) Component for Provision of Social Infrastructure Including Provision of Necessary Equipment, Materials and Medicines

a) Project Component

Table 7.2.2 shows the components of the social infrastructure development program.

Table 7.2.2 Components of Social Infrastructure Development

	Huong Tan Commune	Huong Phung Commune	Huc Commune
Construction of road			
- National road	QL 14B: 5 km	QL 14B: 23 km	QL 14A: 30 km
- Commune road	16 km	14 km	10 km
- Culvert	3	3	-
- Bridge	1	2	3
Construction and renovation of schools and kindergarten:			
- New school	1	3	-
- Improvement of existing school	1	-	-
- Kindergarten/nursery school	1	-	-
- New school with kindergarten	-	-	1
- New classroom	-	-	4
Provision of equipment and medicines:			
- Existing clinic	1	1	-
Construction of health clinic			
- New clinic with equipment	-	-	1
Provision of electricity			
- Extension of cables	7 Km	-	-
- Mini hydro-station	-	1	1
Provision of clean water			
- Dig wells for all villages	10	11	10

Source: JICA Study Team

b) Training of People

The construction of social infrastructure should be accompanied by the training of the project participants and villagers for repairing, operation and maintenance, so that the community people shall be able to operate and maintain the facilities themselves later on.

c) Reasons for Necessities

The above sub-projects for constructing and improving social infrastructure are only a part of necessary infrastructure, but calculated to find out the minimum requirements of a commune.

For example, no villages among 31 villages of the three communes have bridges or culverts for streams, but 3 to 5 streams have to be crossed to reach each village. The villagers are using only stepping-stones or log-bridges to cross the streams. Many more bridges and culverts may be necessary.

As for the national roads 14A and 14B should be separated from this component, because those former national roads should be taken care of by the higher governments, the district or the province, but not by the communes or villages. Also, there are many more roads that need expansion or improvement.

Most schools in remote villages are built with bamboo and thatched roof. These schools have to be completely rebuilt. One school in Huong Tan Commune which was built by UNICEF more than 20 years ago has to be renovated.

There are two clinics that only the facilities have been built by the government or through assistance of UNICEF a few years ago. However, these clinics are nearly without any medical equipment, instruments or very few medicines and cannot function as effective clinics. Immediate provision of necessary equipment and medicines is required.

As for power supply, only three important facilities have been, for the time being, planned to be supplied with electricity, the People's Committee of each Commune, the health clinic, and the residence of the Chairman of the Commune People's Committee. All households should be provided with electricity in the near future, because it is important for the people who are intellectually isolated to provide with information and education, and the Viet Namese language.

No villages among the 31 villages, have water supply or wells. The clinics and schools are also without clean water. Each village, and especially clinics and schools, should be supplied with at least one well.

(3) Component for Capacity Building

Opening of seminars, workshops and demonstrations are required for the implementation of the capacity building in all three communes and the government authorities of provincial and district levels as well. The first group shall be the provincial and district officials whoever involve in this program. The second group of the people are the chairmen, vice-chairmen, village chiefs, and leaders of various organizations including the members of Management Board. The third group is the villagers who shall participate in the projects.

The first and the second groups will be trained by the external experts, then the third group shall be trained by the leaders who have been already trained by the external experts or Viet Namese experts.

The opening of those training shall be assisted by an international, Viet Namese NGOs or experts who have experience of giving such services.

Table 7.2.3 shows the proposed seminars and training programs.

Table 7.2.3 Seminars and Training Programs

Seminar and others	Courses and Description	Target people*
• "Community Development by Participatory Method"	• What is community development • What is participatory method • How to formulate project plans • How to implement, operate, manage and sustain projects • What is development, and so on	a, b and c
• Seminar and Training on Successful Use of Loan and Simple Bookkeeping	• What are loans • Mechanism of loan • How to effectively use loan • Plans for repayment • Bookkeeping for projects • Simple bookkeeping for households and so on.	b and c.
• Seminar, Training and Demonstration on Health	• Public health and sanitation • Nutrition and balanced diet • Child-care • Food preparation - demonstration	b and c. (particularly women)
• Seminar, Demonstration and Training on Better Agriculture	• Cash crop production - coffee, black-pepper, rubber, tea, sugarcane • Food crop production - paddy rice, upland rice • Nutritional crops for garden farming - leguminous plants, vitamins • Animal husbandry - cows, pigs, buffalo • Tree plantation • VAC	b and c.
• Seminar, Demonstration and Training on Simple Civil Engineering and Carpentry	• Simple civil engineering - road construction and repairing, bridge and culvert construction and repairing • Carpentry - school and clinic construction and repairing • House construction and repairing	b and c.
• Establishment of Supporting System at District People's Committee	• Technical support: For training, operation and maintenance of infrastructure and equipment • Health services: For training of health care and provision of health services	

Note: *Target people:

a. Government officials for development concerned of provincial and district levels

b. Chairmen and vice-chairmen of the Commune People's Committee, village chiefs, and leaders of various organizations

c. Villagers who participate in the projects

2) Project Cost for Infrastructure Component

The following is the project cost for the component for "Provision of Social Infrastructure." In order to find out approximate cost that might be required to provide social infrastructure to a commune, three sample communes in the poor mountainous region of ethnic minorities in the District of Huong Hoa, Quang Tri Province have been selected, and the calculations were made based on their requirements.

These calculations have been used as the basis for the calculation for the cost estimation of 20 communes for pilot projects.

(1) Commune roads and bridges

The basis for **road** construction cost is US$6,400/Km.

40 x 6,400 = 256,000

The total length of the roads need to be rehabilitated 40 kilometers	$256,000
The basis for construction of culverts of 4 meters wide is US$455/m	
6 culverts of average of 7 meters long are needed	
455 x 7 x 6 = 19,110	$19,100
The basis for constructing bridges of 4 meters wide are US$1,636/m	
6 bridges of average of 12 meters are needed	
1,636 x 20 x 6 = 196,320	$196,300
Construction of **roads, bridges** and **culverts**	**Total: $471,400**

(2) Primary schools, nursery schools, kindergarten

The construction of schools, kindergarten and nursery schools are calculated at US$136/m^2.

• Huong Tan Commune	
1 school for rehabilitation in Tram village	$39,400
1 kindergarten and 1 nursery school in Tram village	8,200
1 school for Ruong village	10,900
• Huong Phung Commune	
1 new school for Doa Cu village	$10,900
1 new school for Cheng village	10,900
1 new school for Ma Lai village	10,900
• Huc Commune	
4 additional classrooms for the existing school for Ta Rung village	21,800
1 new school with kindergarten in Huc Van village	14,000
Construction and rehabilitation of schools:	**Total: $127,000**

(3) Health clinics, and equipment and materials

The construction and renovation of health clinic is calculated at US$136/m^2.

• Huong Tan Commune	
Equipment and medicine for the clinic in Tram village	$13,600
• Huong Phung Commune	
Equipment and medicine for the clinic in Aroang	13,600
• Huc Commune	
1 new clinic for Ta Rung village with equipment and medicines	27,200
Construction and provision of equipment and medicines for Clinics	**Total: $54,400**

(4) Power Supply

- Huong Tan Commune

  Basis for calculation of extension of cable construction is US$10,909 /Km
  10,909 x 7 = 76,363 $76,400
  Outdoor wiring (including electric poles at 20 meters interval requires US$16.50/m
  16.5 x 150 = 2,475 2,500

- Huong Phung Commune

  Construction of one small-scale power station for one village as pilot case
  Plant and Equipment 30,000
  Construction 10,000
  Outdoor wiring for 40 households
  16.5 x 20 x 40 = 13,200 13,200

- Huc Commune

  Construction of one small-scale power station for one village as pilot case
  Plant and Equipment 30,000
  Construction 10,000
  Outdoor wiring for 40 households
  16.5 x 20 x 40 = 13,200 13,200

Construction and provision of **electricity** to 3 villages **Total: $185,300**

(5) Water Supply

The basis for calculation of construction of one well including a pulley or a hand pump is US$600.

The total of **31 wells**, one well in each village are needed

600 x 31 = 18,600 **Total: $18,600**

Grand total for social infrastructure component of three sample communes:

Grand Total: $856,700

The above calculations show that the total estimated cost for the three communes for provision of infrastructure requires US$856,700. By dividing this amount by three, the average estimated cost for one commune is obtained, which is US$285,500. Then this amount was multiplied by 20. Thus, **the total cost required for the 20 pilot projects is US$5,710,000.**

The details of the above calculations are shown on the Table 7.2.4 "Cost Estimate for Social Infrastructure."

Table 7.2.4 Cost Estimate for Social Infrastructure

Unit: US dollars

Type of Infrastructure	Huong Tan Commune	Huong Phung Commune	Huc Commune	Average per Commune	Estimate for 20 Communes
Road Construction					
Culverts	$9,600 (3)	$9,600 (3)	-	$6,400	$128,000
Bridges	32,700 (1)	65,400 (2)	98,100 (3)	65,400	1,308,000
Road Rehabilitation	102,400 (16 Km)	89,600 (14 Km)	64,000 (10 Km)	85,300 (13 Km)	1,706,000
Road Total					**3,142,000**
Construction/Renovation of Schools					
New School (small)	10,900 (1)	32,700 (3)	14,000 (1)	19,200	384,000
Kindergarten/Nursery	8,200 (1)	-	-	2,700	54,000
Renovation (large)	39,400 (1)	-	21,800 (1)	20,400	408,000
School Total					**846,000**
Construction of Clinic /Equipment/Materials					
New Clinic	-	-	13,600	4,500	90,000
Equipment/medicines	13,600	13,600	13,600	13,600	272,000
Clinic Total					**362,000**
Construction of Mini Hydro-station/Cables					
New Mini Hydro (set)/	-	53,200 (1)	53,200 (1)		-
Cable Extension	78,900 (7 km)	-	-	61,800	1,236,000
Electricity Total					**1,236,000**
Water Supply/ Construction of Wells	6,000 (10)	6,600 (11)	6,000 (10)	6,200	124,000
Water Total					**124,000**
TOTAL COST FOR INFRASTRUCTURE	$301,700	$270,700	$284,300	Average for 1 commune $285,500	**For 20 Communes $5,710,000**

Source: Study Team Survey, October, 1996

7.2.3 Implementation Schedule

All three components, "Poverty Alleviation through Agricultural Development," "Provision of Social Infrastructure and Services" and "Capacity Building" shall be carried out in the three communes of Quang Tri Province first starting from the latter part of 1999, then other selected 17 Communes for pilot projects will be followed until the year 2000 or 2001. And these shall be largely expanded after the year 2001 upon evaluation and adjustment of the program based on the results come out from the pilot projects, and may continue up to the year 2010.
It is expected that by the end of the year 2010, the projects cover all poor communes of the mountainous regions of ethnic minorities in the four provinces, that is approximately 280,000 ethnic minorities of some 160 communes, and 70% of them shall benefit from the program, so that nearly 200,000 of the minorities shall get out of the categories of "poor" and "starving", and no longer need to rely on government's subsidies. They shall become self-reliant.

7.3 DUNG QUAT INDUSTRIAL DEVELOPMENT PROJECT (DQI)

7.3.1 Project Purpose

The purpose of the project is to deepen and broaden the country's industrial structure by establishing a third industrial growth pole in Viet Nam. Production output of the planned industries is mainly for import-substitution and supply to the domestic market thereby saving foreign exchange and providing a positive impact on the Viet Nam's balance of payments. In addition, the project carries high potentials for employment generation and technology transfer.

7.3.2 Markets and Demand Forecast

In line with Viet Nam's accelerated GDP growth and rapid increase in per capita income, demand for petroleum products is estimated to increase from some 5.03 million tons in 1995 to about 17.8 million tons in 2010. Currently, Viet Nam has no refining capacity with petroleum products being imported. Likewise, petrochemical products are presently being imported. Demand for PVC is estimated to grow from 55,000 tons in 1995 to about 440,000 tons in 2010. Demand for DOP should increase from 15,000 tons in 1995 to some 120,000 tons in 2010. Demand for polyester, polystyrene, polypropylene, polyethylene and LDPE/LLDE should increase from 91,000 tons to about 873,000 tons in 2010. Demand for HDPE will grow from 25,000 to 180,000 and that for synthetic detergent will grow from 100,000 to some 550,000 tons by the year 2010.

In addition, demand for various steel products, which was in the order of magnitude of some 1.0 to 1.3 million tons in 1995 is estimated to grow between 15% to 20% over the coming decade.

7.3.3 Major Project Components

1) Project Location

The Dung Quat Industrial Estate project is located in Dung Quat, Binh Son District, Quang Ngai Province. The site is located some 30 km north from Quang Ngai Town and about 100 km south of Da Nang City. The construction site faces the Dung Quat small bay with some 4 km bay from Coco to Tra Khuc River mouth with an existing average water depth ranging from 6 to 20 meters. The project location is identified in Figure 7.3.1.

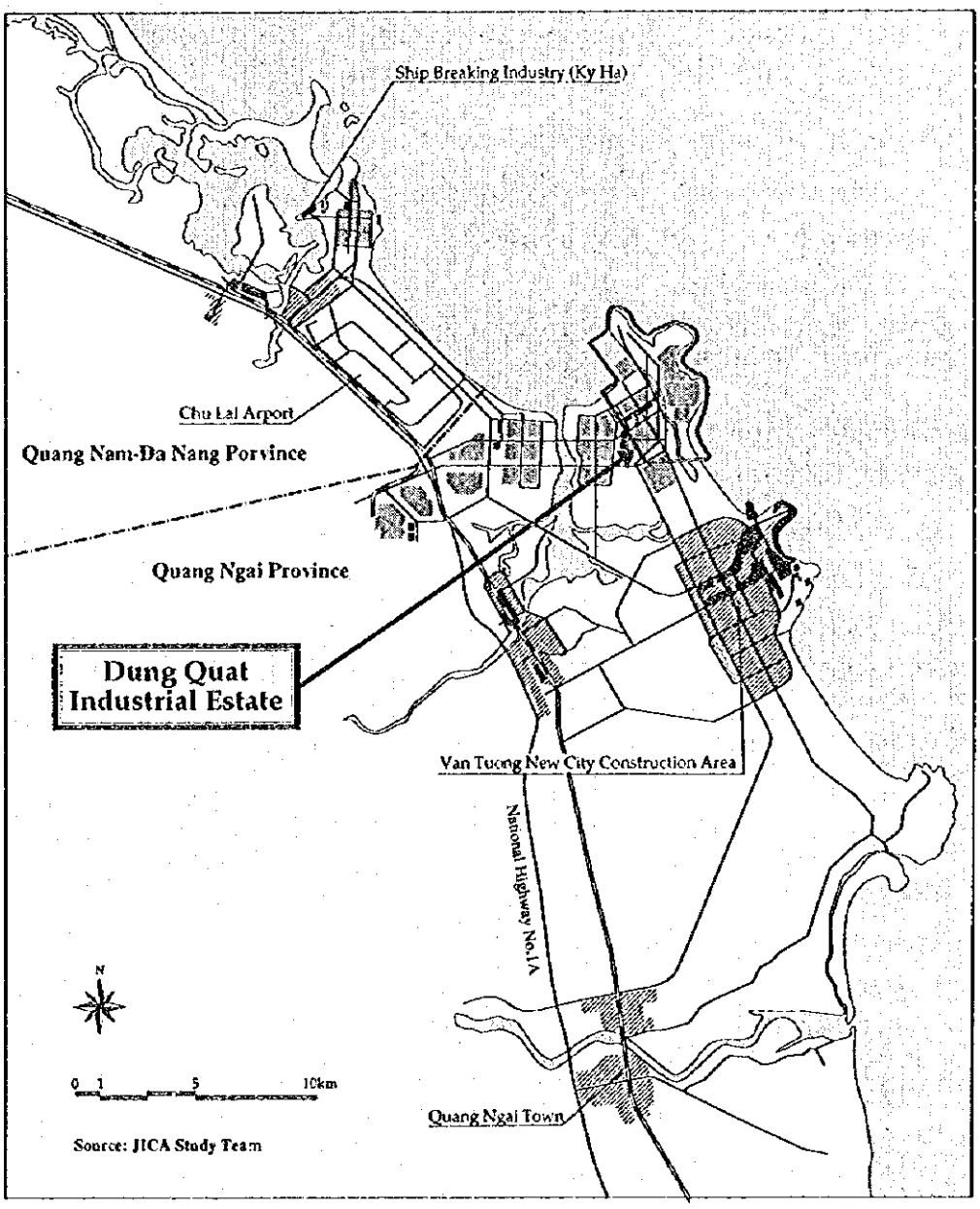
2) Direct Project Components and their Development Schedule

The major project components inside the industrial estate are :

- A thermal power plant (150MW). To be completed by 2002
- The 1st oil refinery, including national oil storage with a capacity of 240,000 liters. To start operations by 2003
- The 1st petrochemical industry. To start operations by 2003.
- A second thermal power plant (150MW). To be completed by 2006
- The 2nd oil refinery, including national oil storage with a capacity of 240,000 liters. To start operations by 2006
- Petrochemical related industries. To be start operations by 2006
- Ship repair and ship breaking industries. To start operations by 2007

- A steel scrap and recycling mill. To start operations by 2007
- Additional related petrochemical industries. To start operations by 2008, and
- Iron and related industries, also to start operations by 2008.

Figure 7.3.1 Location Map of the Dung Quat Industrial Estate



The main features of the production units in terms of production capacity, size of industrial site, estimated number of employees, estimated industrial water consumption, electric power demand and estimated generated freight volume are summarized in Table 7.3.1. The preliminary layout plan for the industrial estate is depicted in Figure 7.3.2.

3) Indirect Project Components

Indirect project components are all those, which are either located physically outside the industrial estate, but are needed to support the industrial estate function in the short to long term, or are needed in order to support on-site construction. Those components are :

- Access road
- Wharf for construction material & equipment
- Temporary water supply & sewerage system
- Water supply and sewerage system, and
- Communication systems.

Indirect project components have been included in the economic evaluation, that is national point of view, of the industrial estate project.

7.3.4 Estimated Project Cost

Project cost have been estimated in three principal categories, namely :

- On site development cost
- Off site development cost, and
- Cost for temporary works.

All three cost components have been taken into account in the economic analysis. For the financial analysis, however, only on site industrial estate development cost have been included.

The total on site development cost for the industrial estate covering :

- Land development
- Port development
- Road development
- Water & sanitation development, and
- National oil storage development

are estimated at some US $ 818.23 million (rounded). Off site development costs have been estimated at about US $ 395.08 million and cost for temporary work are estimated at a total of some US $ 14.77 million.

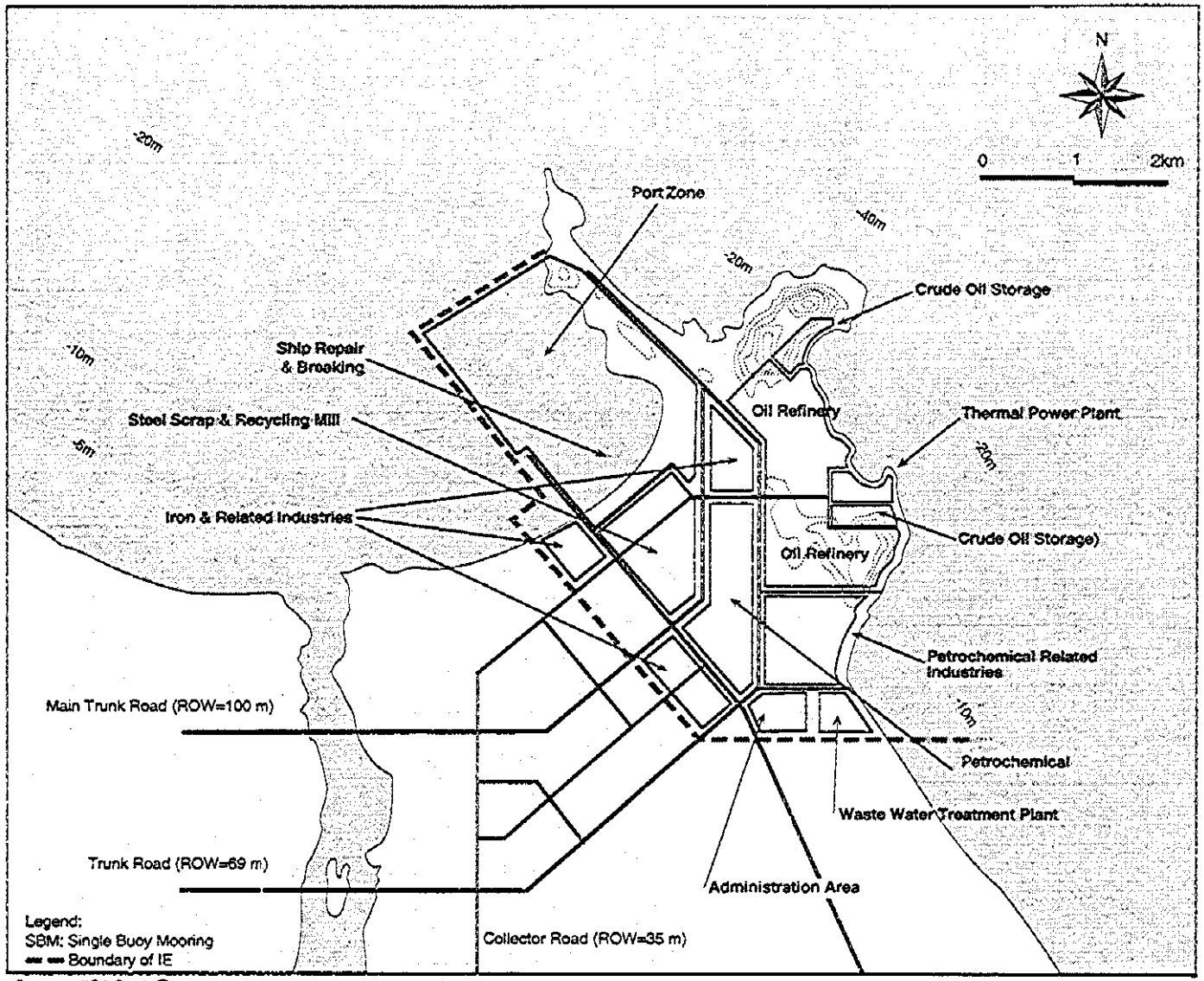
Hence total cost, that is for the industrial estate itself and related off site facilities would amount to a total of US $ 1,228.08 million as summarized in Table 7.3.2.

Table 7.3.1 Key Features of the Dung Quat Industrial Estate

Name of Industry	Production Capacity	Industrial Land	Number of Employee	Industrial Water Consumption	Electric Power	Freight Volume
Petroleum Refinery No. 1 (year 2002)	6.5 mill. t/year	110 ha	400 persons	11,040 t/day	14,000 KWH	6.500 mil. t/year 5.938 mil. t/year
Petroleum Refinery No. 2 (year 2005)	6.5 mill. t/year	110 ha	500 persons	17,040 t/day	57,000 KWH	6.500 mil. t/year 5.454 mil. t/year
Petrochemical No. 1 (year 2002) and Petrochemical No.2 (year 2005)	1,197 thous. t/year	100 ha	400 persons	26,400 t/day	60,000 KWH	0.063 mil. t/year
Electric Thermal Power Plant (year 2002)	150 MW	8 ha	200 persons	250 t/day	-	0.165 mil. t/year (Oil)
Electric Thermal Power Plant (year 2006)	150 MW	7 ha	100 persons	250 t/day	-	0.165 mil. t/year (Oil)
Ship Breaking and Repair (year 2006)	Ship Breaking upto 250,000 (500,000 tons/year) Repair 80,000 to 250,000 DWT X 50/year	100 ha	1,500 persons	2,800 t/day	5,800 KWH	1.5 mil. t/year
Steel Scrap and Recycling Mill Electric Arc Furnace and Rolling Mills (year 2006)	Electric Arc Furnace 500,000 tons Hot & Cold Mills	100 ha	1,500 persons	16,000 t/day	97,000 KWH	2.5 mil. t/year
Iron and steel related industries	14 kinds of industries Output: 121 mil. US$	110 ha	2,800 persons	12,000 t/day	17,000 KWH	1.7 mil. t/year
Petrochemical related industries	8 kind of industries Output: 103 mil. US$	90 ha	2,300 persons	72,000 t/day	23,000 KWH	1.5 mil. t/year
Total		735 ha	9,700 persons	157,780 t/day	273,800 KWH	31.985 mil. t/year

Source: JICA Study Team

Figure 7.3.2 Conceptual Layout of Dung Quat Industrial Estate



Source: JICA Study Team
Note: Water depth indicates the existing condition
ROW=Right of Way

Table 7.3.2 Total Cost for Dung Quat Industrial Estate

Main Cost Category	Activity	Estimated Investment Costs in 1996 US $
A.) On site Development		
	Land Development	83,407,000
	Port Development	474,893,000
	Road Development	39,435,000
	Water & Sanitation Development	172,494,000
	Oils Storage Tank Development	48,000,000
Sub-Total On Site Development		818,229,000
B.) Off Site Development		395,078,000
C.) Temporary Works		14,772,000
Total Investment Costs		1,228,079,000

Source : JICA study team.

7.3.5 Evaluation Results

1) Economic Evaluation

The economic evaluation investigates the desirability of the project from a national and economic efficiency point of view. For that purpose all facilities, that is on site, off site and temporary facilities have been taken into account. The estimated construction cost include engineering cost and physical contingencies. However, no price contingencies have been included. A standard conversion factor (SCF) of 0.9 has been employed to convert financial into economic cost. The estimated construction cost have been distributed evenly over the construction period of each item. The operation and maintenance cost (O&M) have been estimated at 1% of construction cost for the industrial estate infrastructure, at 4% for the water supply system and sanitation plant and at 3% for the power plants.

The opportunity cost for land have been estimated as the reduction of net income caused to the farmers and fishermen presently living in and around the project site. It is estimated that there are some 1,000 households engaged in agricultural production inside the planned industrial estate and some 500 farming households outside the direct estate area. Hence, some 1,500 agricultural households will be effected by the project. Also, there are some 1,000 fishermen households directly and 500 households indirectly effected.

Compensation money to the agricultural and fishermen households as well as rent, which the Dung Quat Industrial Estate management body would have to pay to the Government have been treated as transfers.

Economic benefits have been estimated employing a value added per hectare rather than per employee approach. This is justified, since all industries to be located in the industrial estate are process industries with state-of-the art machinery and technology.

The results of the economic evaluation are summarized in Table 7.3.3. Employing a cut off rate of 12% and a 50 years time horizon (land rent is allowed for up to 50 years) shows that the project is recommendable from an overall economic point in view of the following key indicators :

- NPV = 835,735,000 US $
- Benefit/Cost Ratio = 2.24, and
- EIRR = 23.00%.

Economic Analysis (Port, Oil Tank, amd Power Plants included)

Table 7.3.3 Economic Internal Rate of Return Calculation

(Unit: US$1,000)

		Negative Side					Positive Side						Net Benefit	
		Income Reduction		Cost for I.E.			Value Added							
	Year	Farmers	Fishermen	Const	O & M	Total Cost	Oil Refinary	Petrochemical	Petchem Related	Steel Mill	I & S Related	Total Value Added	Annual	Cumulative
1	1997	3	5	13,295	0	13,303	0	0	0	0	0	0	-13,303	-13,303
2	1998	149	160	10,781	0	11,090	0	0	0	0	0	0	-11,090	-24,393
3	1999	216	205	69,169	0	69,589	0	0	0	0	0	0	-69,589	-93,983
4	2000	216	205	144,474	216	145,110	0	0	0	0	0	0	-145,110	-239,093
5	2001	436	466	195,927	216	197,047	0	0	0	0	0	0	-197,047	-436,140
6	2002	583	626	172,660	4,445	178,315	0	0	0	0	0	0	-178,315	-614,455
7	2003	658	733	177,402	7,153	185,946	59,998	84,326	0	0	0	144,324	-41,622	-656,077
8	2004	671	750	226,278	7,153	234,852	59,998	84,326	0	0	0	144,324	-90,528	-746,605
9	2005	671	750	98,526	15,188	115,135	59,998	84,326	0	0	0	144,324	29,189	-717,417
10	2006	710	805	17,147	21,336	39,998	119,996	168,652	0	0	0	288,648	248,650	-468,766
11	2007	710	805	12,910	21,463	35,887	119,996	168,652	0	14,663	0	303,311	267,424	-201,343
12	2008	710	805	12,910	21,463	35,887	119,996	168,652	158,380	14,663	25,414	487,105	451,218	249,875
13	2009	710	805	12,910	21,463	35,887	119,996	168,652	158,380	14,663	25,414	487,105	451,218	701,093
14	2010	710	805	12,910	21,463	35,887	119,996	168,652	158,380	14,663	25,414	487,105	451,218	1,152,311
15	2011	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	1,615,664
16	2012	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	2,079,016
17	2013	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	2,542,369
18	2014	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	3,005,722
19	2015	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	3,469,075
20	2016	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	3,932,428
21	2017	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	4,395,780
22	2018	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	4,859,133
23	2019	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	5,322,486
24	2020	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	5,785,839
25	2021	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	6,249,192
26	2022	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	6,712,545
27	2023	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	7,175,897
28	2024	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	7,639,250
29	2025	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	8,102,603
30	2026	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	8,565,956
31	2027	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	9,029,309
32	2028	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	9,492,662
33	2029	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	9,956,014
34	2030	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	10,419,367
35	2031	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	10,882,720
36	2032	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	11,346,073
37	2033	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	11,809,426
38	2034	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	12,272,778
39	2035	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	12,736,131
40	2036	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	13,199,484
41	2037	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	13,662,837
42	2038	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	14,126,190
43	2039	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	14,589,543
44	2040	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	15,052,895
45	2041	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	15,516,248
46	2042	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	15,979,601
47	2043	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	16,442,954
48	2044	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	16,906,307
49	2045	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	17,369,660
50	2046	710	805	0	22,237	23,752	119,996	168,652	158,380	14,663	25,414	487,105	463,353	17,833,012
		32,692	36,916	1,177,298	942,103	2,189,009	5,099,815	7,167,717	6,176,837	586,522	991,130	20,022,021	17,833,012	

NPV (12%) : 835,735
B/C (12%) : 2.24
EIRR: 23.00%

2) Financial Evaluation

The financial evaluation is undertaken from the project sponsor's point of view, that is the Dung Quat Industrial Estate Development Company.

Major cash outflow (project cost) components include construction cost and O&M costs, excluding costs and profits for the power plants, infrastructure off site and temporary works for construction, roads and bridges. It is assumed that these costs will be reasonably offset by the income from user charges and/or taxes imposed on the locators. The O&M cost are estimated at 1% of the construction cost and at 4% for the water supply and sanitation plant. Land acquisition cost (compensation) is paid once to the resettlers at the time of acquisition. Rent is paid every year.

Major cash inflow (project benefit) components for the Dung Quat Industrial Estate management company comprise lots and seasurface sales, port charges, utility maintenance charges and administration fees.

The financial internal rate of return (FIRR) has been calculated for two scenarios, namely one, which includes the construction cost for the port and crude oil tanks, and the other, which excludes these construction costs and the benefit stream resulting from port revenues. The cut off rate employed is 12% and the time horizon 50 years. The detailed calculation is summarized in Table 7.3.4 and 7.3.5, respectively. The results for case 1, that is including port and oil tank costs, are :

- NPV = - 206,501,000 US $
- Benefit/Cost Ratio = 0.53
- FIRR = 3.39%.

The results for case 2, that is without port and oil tank investment costs, are :

- NPV = 26,848,000
- Benefit/Cost Ratio = 1.16
- FIRR = 16.54.

The above results mean that the Dung Quat industrial estate may be attractive to an investor if the investment cost for the port and the crude oil tank is born by someone else. The port and the oil tanks are important infrastructure from the point of view of the national economy. Taking into account the results of the economic analysis, it is recommended to construct these facilities either from public funds and/or through an ODA scheme.

3) Sensitivity Analysis

A sensitivity analysis has been conducted for the recommended case 2, that is without port and oil tank facilities. The analysis shows that in case that the lot prices go down by 10%, the FIRR declines to 14.14%. In case that the construction cost go up by 10%, the FIRR declines to 13.47%.

4) Overall Assessment

The project is recommendable from the point of view of overall economic analysis. The NPV is negative and the financial internal rate of return, however, does not justify investment into the industrial estate, if investment cost for the port and tank facilities are included into the total investment outlay.

Financial Analysis (Port & Oil TanK included)

Table 7.3.4 Financial Internal Rate of Return (Case 1)

(Unit: US$1,000)

	Year	Annual rental fee	Cash Outflows: Land Comp	Cash Outflows: I.E. Construction	Cash Outflows: O & M Cost	Cash Outflows: Total Cost	Cash Inflows: Lot Sales	Cash Inflows: Port Charge	Cash Inflows: Sea Surface	Cash Inflows: Utility O & M	Cash Inflows: Administration	Cash Inflows: Total Revenue	Net Cashflow: Annual	Net Cashflow: Cumulative
1	1997	1	59	0	0	60	0	0	0	0	0	0	-60	-60
2	1998	36	1,455	11,979	0	13,469	0	0	0	0	0	0	-13,469	-13,530
3	1999	39	133	62,641	0	62,813	1,200	0	0	0	0	1,200	-61,613	-75,143
4	2000	39	0	87,791	240	88,070	49,200	0	30	0	0	49,230	-38,840	-113,983
5	2001	104	2,731	100,651	240	103,725	0	0	0	0	0	0	-103,725	-217,708
6	2002	139	1,489	119,109	2,008	122,745	1,050	0	0	4	48	1,102	-121,643	-339,351
7	2003	169	1,268	131,128	2,085	134,650	49,050	2,600	30	3,821	2,016	57,517	-77,133	-416,484
8	2004	174	211	147,874	2,085	150,344	60,000	2,600	13	3,821	2,016	68,449	-81,895	-498,379
9	2005	174	0	57,701	8,154	66,028	60,000	5,379	0	3,887	2,058	71,324	5,295	-493,084
10	2006	189	655	19,053	12,126	32,023	0	7,942	0	10,963	4,020	22,925	-9,098	-502,181
11	2007	189	0	14344	12,267	26,801	0	8,637	0	18,878	6,420	33,935	7,134	-495,047
12	2008	189	0	14344	12,267	26,801	0	9,485	0	24,009	8,820	42,313	15,513	-479,534
13	2009	189	0	14344	12,267	26,801	0	9,706	0	24,014	8,820	42,540	15,739	-463,795
14	2010	189	0	14344	12,267	26,801	0	9,942	0	24,019	8,820	42,781	15,980	-447,815
15	2011	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	-418,351
16	2012	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	-388,888
17	2013	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	-359,424
18	2014	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	-329,960
19	2015	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	-300,496
20	2016	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	-271,033
21	2017	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	-241,569
22	2018	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	-212,105
23	2019	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	-182,642
24	2020	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	-153,178
25	2021	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	-123,714
26	2022	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	-94,251
27	2023	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	-64,787
28	2024	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	-35,323
29	2025	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	-5,860
30	2026	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	23,604
31	2027	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	53,068
32	2028	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	82,532
33	2029	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	111,995
34	2030	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	141,459
35	2031	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	170,923
36	2032	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	200,386
37	2033	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	229,850
38	2034	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	259,314
39	2035	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	288,777
40	2036	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	318,241
41	2037	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	347,705
42	2038	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	377,168
43	2039	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	406,632
44	2040	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	436,096
45	2041	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	465,560
46	2042	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	495,023
47	2043	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	524,487
48	2044	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	553,951
49	2045	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	583,414
50	2046	189	0	0	13,128	13,317	0	9,942	0	24,019	8,820	42,781	29,464	612,878
		8,635	8,000	795,303	548,609	1,360,548	220,500	414,203	73	978,092	360,558	1,973,426	612,878	

NPV (12%) : -206,501
B/C (12%) : 0.53
IRR: 3.39%

Table 7.3.5 Financial Internal Rate of Return (Case 2)

Financial Analysis (Port & Oil Tank excluded)

(Unit: US$1,000)

Year		Cash Outflows: Annual rental fee	Land Comp	I.E. Construction	O & M Cost	Total Cost	Cash Inflows: Lot Sales	Port Charge	Sea Surface	Utility O & M	Administration	Total Revenue	Net Cashflow: Annual	Cumulative
1	1997	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1998	27	1,128	0	0	1,155	0	0	0	0	0	0	-1,155	-1,155
3	1999	30	133	6,288	0	6,451	1,200	0	0	0	0	1,200	-5,251	-6,406
4	2000	30	0	43,417	0	43,447	49,200	0	30	0	0	49,230	5,783	-623
5	2001	82	2,186	44,277	0	46,545	0	0	0	0	0	0	-46,545	-47,168
6	2002	117	1,489	35,380	197	37,182	1,050	0	0	4	48	1,102	-36,081	-83,248
7	2003	147	1,268	59,398	275	61,087	49,050	0	30	3,821	2,016	54,917	-6,171	-89,419
8	2004	147	0	64,145	275	64,566	60,000	0	13	3,821	2,016	65,849	1,283	-88,136
9	2005	147	0	31,357	4,120	35,624	60,000	0	0	3,887	2,058	65,945	30,321	-57,815
10	2006	162	655	4,709	7,852	13,378	0	0	0	10,963	4,020	14,983	1,605	-56,210
11	2007	162	0	0	7,994	8,156	0	0	0	18,878	6,420	25,298	17,142	-39,068
12	2008	162	0	0	7,994	8,156	0	0	0	24,009	8,820	32,829	24,673	-14,395
13	2009	162	0	0	7,994	8,156	0	0	0	24,014	8,820	32,834	24,678	10,283
14	2010	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	34,966
15	2011	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	59,649
16	2012	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	84,332
17	2013	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	109,015
18	2014	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	133,698
19	2015	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	158,381
20	2016	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	183,064
21	2017	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	207,747
22	2018	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	232,430
23	2019	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	257,113
24	2020	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	281,796
25	2021	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	306,479
26	2022	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	331,162
27	2023	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	355,845
28	2024	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	380,528
29	2025	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	405,211
30	2026	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	429,894
31	2027	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	454,577
32	2028	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	479,260
33	2029	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	503,943
34	2030	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	528,626
35	2031	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	553,309
36	2032	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	577,992
37	2033	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	602,675
38	2034	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	627,358
39	2035	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	652,041
40	2036	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	676,724
41	2037	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	701,407
42	2038	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	726,090
43	2039	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	750,773
44	2040	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	775,456
45	2041	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	800,139
46	2042	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	824,822
47	2043	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	849,505
48	2044	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	874,188
49	2045	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	898,871
50	2046	162	0	0	7,994	8,156	0	0	0	24,019	8,820	32,839	24,683	923,554
		7,379	6,859	288,971	332,460	635,669	220,500	0	73	978,092	360,558	1,559,223	923,554	

NPV (12%) : 26,848
B/C (12%) : 1.16
IRR : 16.54%

If the investment cost for the port and tank facilities are covered either by public funds and/or an ODA scheme, the NPV's and FIRR's would broadly justify the total investment outlay as summarized in Table 7.3.6.

Table 7.3.6 Summary FIRR Results and Sensitivity Analysis

Cases	FIRR %	NPV US $	B/C	PBP Year
Base Case *)	16.54	26,848,000	1.16	2026
Alternative 1 **)	14.14	14,122,000	1.08	2009
Alternative 2 ***)	13.47	10,220,000	1.05	2010

Notes :

*) Excluding port and national oil storage tank facilities.

**) Excluding port and national oil storage tank facilities and lot lease income is reduced by 10%.

***) Excluding port and national oil storage tank facilities and construction cost are increased by 10%.

Source : JICA study team.

7.3.6 Proposed Implementation Organization

1) Organization System

Establishment of an independent Dung Quat Industrial Development Corporation is recommended to directly administer and manage the implementation of the Dung Quat Industrial Estate. The corporation will execute the construction works of the estate and operate it. This corporation will be controlled by the proposed CRDC until the substantial completion of the supporting infrastructure development. In order to attain financial self-sufficiency for its operation and maintenance, the corporation should collect lease charges for the developed land, and user charges for port, water, and other utilities/facilities.

Deficiencies in infrastructure are a major constraint to private sector development. The industrial estate is to provide an environment conducive to domestic and foreign private investment by providing basic infrastructure such as roads, power, water supply, drainage, and telecommunication system in that area, as well as simplifying the administrative procedures for processing and approving investment applications. The industrial estate is also expected to generate employment and create linkages with the local economy.

To this end, the functions of CRDC in terms of Dung Quat Industrial Development Project include:

- To ensure one-stop service for foreign developers
- To provide information to investors
- To introduce and supply laborers required by enterprises in the IE
- To invest in the Dung Quat Industrial Corporation through equity (in kind) participation
- To accumulate experience, skills, manpower, and financial power for subsequent projects

The Dung Quat Industrial Corporation is solely responsible for the entire implementation of the Dung Quat Industrial Development Project. The corporation should be empowered with the functions for regulation, licensing, permission, and other administrative affairs, and vested with the responsibility for planning, implementation, and operation and management of the

entire development cycle. The corporation should secure the development of the designated IE area with the following, but not necessarily limited to, functions:

- To acquire, hold and manage land in the IE area for its development by CRDC or any other person or party authorized by CRDC.
- To prepare a planning scheme for the development of the land in the IE area;
- To develop or dispose any land in the IE area or otherwise to secure the best use of any such land;
- To encourage and promote in investment in the IE area; and
- To provide such infrastructure and to carry out such facilities and services as may be required to attract investment.

Promotion and marketing of the industrial estate should be undertaken by the Dung Quat Industrial Corporation, while marketing may be the sole responsibility of the Corporation.

2) Management Board

The Management Board of Dung Quat Industrial Development Project may consist of the Deputy Director of MPI and the Vice Chairman of the People's Committee as Managing Directors and members, who are representatives of various ministries in the province: Director of the Ministry of Trade, Director of the Ministry of Finance, and representatives from the State Bank, Interior Ministry, Customs and the People's Committee.

The proposed Dung Quat Industrial Development Corporation may require broad-based training inputs. In the short-term, recruitment of key senior managers and/or professional consultants in conjunction with a program of technical assistance would overcome the pressing need for the Corporation to be effectively functioning from the outset.

The organization structure of the Dung Quat Industrial Development Corporation is shown in Figure 7.3.3.

7.3.7 Implementation Schedule

1) Proposed Implementation Schedule

Figure 7.3.4 summarizes the tentative implementation schedule for the project.

2) Initial Environmental Examination

The initial environmental examination (IEE) for this project has been carried out. This project consists mainly of a petroleum refinery, petrochemical plant, thermal power plant and its supporting facilities. Therefore, this project will have the possibilities of significant impacts on the environment. On the social environment, it is necessary to consider the indirect impacts on the economic activities, traffic and public facilities, water rights and rights of common and public health, and the direct impacts on the residents, such as resettlement, split of communities, and hazards (risk). On the other hand, on the natural environment, it is necessary to fully understand the distribution of the natural conditions which will be affected by this project. The natural conditions include fauna and flora, hydrological condition, coastal condition, meteorology, topography, geology and so on. Also, it is important to take measures for preventing negative environmental impacts caused by this project. Especially, pollution has a serious impact on public health, it is necessary to establish measures on pollution control of air pollution, water pollution, noise and vibration. Implementation of an environmental impact assessment in accordance with Vietnamese laws and regulations on environmental protection is required.

Figure 7.3.3 Organization Structure

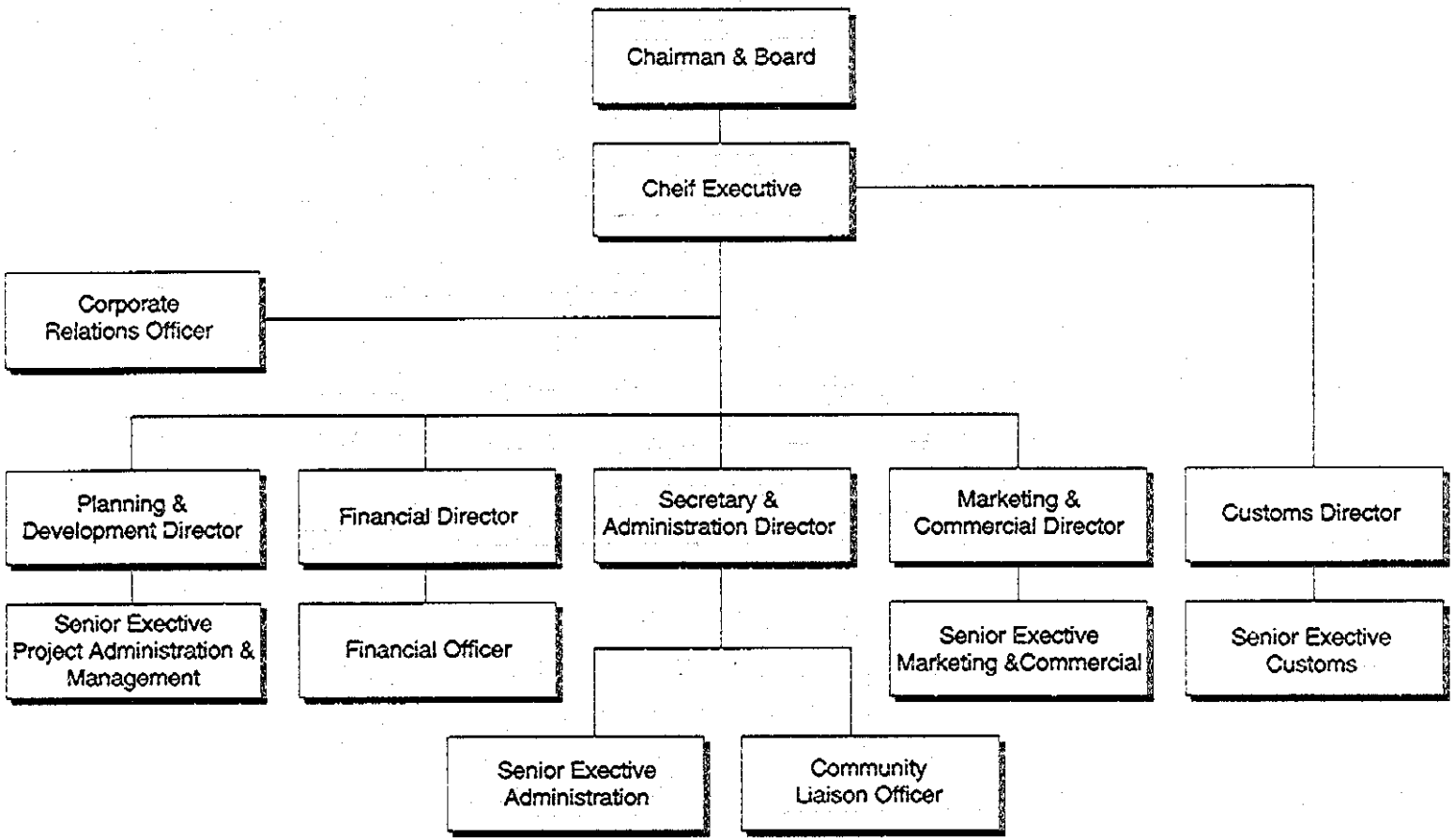
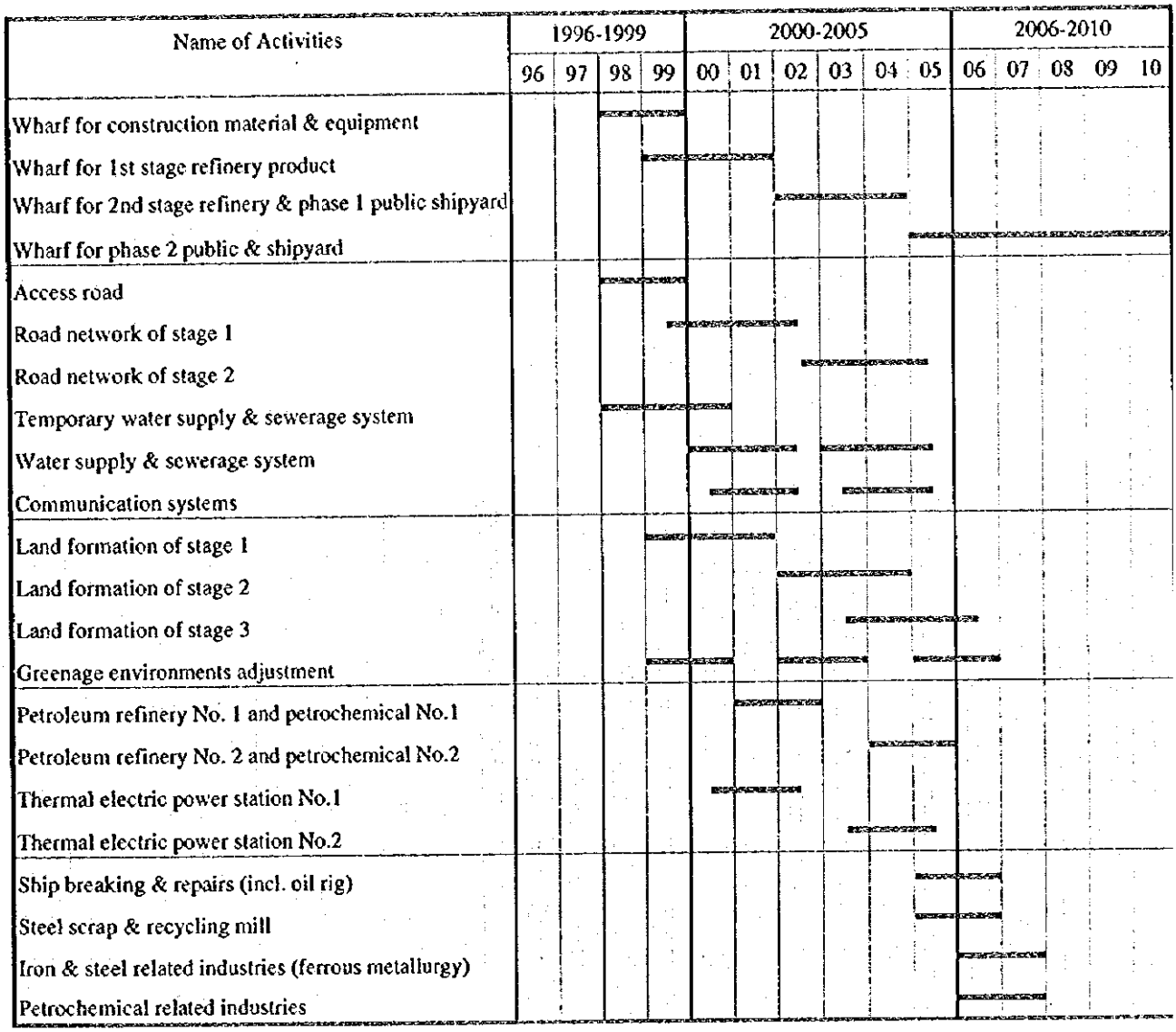


Figure 7.3.4 Tentative Implementation Schedule



Source: JICA Study Team

7.4 TOURISM INFRASTRUCTURE IMPROVEMENT AND TOURISM PROMOTIN ZONE DEVELOPMENT PROJECT (TII & TPZ)

7.4.1 Priority Project for Tourism Product Development

The projects are selected in each tourism priority area designated as described in the previous chapter 4. The following tree priority projects are selected in consideration of the provision of basic tourism facilities, optimum development scale, instant economic development effects, resources and environment conservation. Other regional development projects such as transportation, urban development, environment improvement projects are also take into account.

- Tourism Infrastructure Improvement Project (TII)
- Hoi An Tourism Promotion Zone (TPZ) Development Project
- Lang Co TPZ Development Project

These projects are divided in two categories of (1) the tourism infrastructure improvement project and (2) TPZ development projects. The former focuses on the improvement of tourism related facilities in existing priority tourism areas. The latter focuses on the creation of new tourist bases and attractions to meet the future tourism sector demand.

1) Tourism Infrastructure Improvement

This project covers the five priority tourism areas of Da Nang Center, Hoi An-Cham, Lang Co -Chang May, Bach Ma - Bana and Hue Historical Center. The objectives of the project are as follows.

- To support the tour route network development
- To create attracting and comfortable environment
- To formulate a system for environmental revitalization of tourism assets
- To encourage economic activities of local communities

2) Tourism Promotion Zone (TPZ) Development

The TPZ is an area that accumulaties tourism facilities and forms tourist bases, aiming at:

- Accumulating tourism facilities
- Controlling environmentally negative impacts by providing public infrastructure
- Effectively providing necessary public services
- Effectively providing infrastructure, and
- Regulating land speculation

The Hoi An TPZ and the Lang Co TPZ are selected as priority projects in accordance with the results of the analysis on the development potential and necessity for environmental conservation.

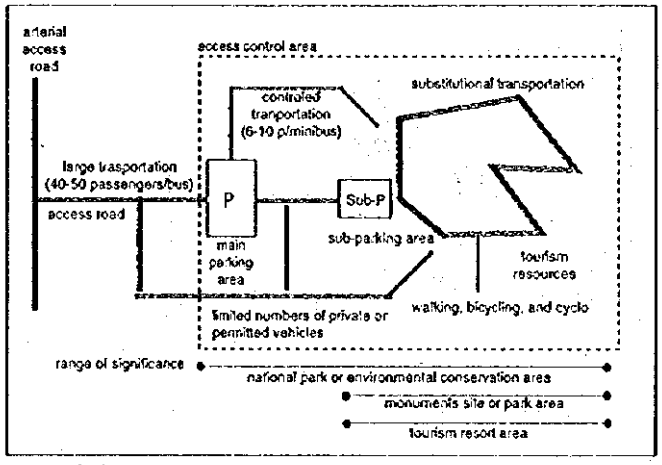
7.4.2 Tourism Infrastructure Improvement Project (TII)

1) Project Components

(1) Accessibility improvement on road and waterway

According to the characteristics of the access road, such as traffic volume, road side land use and attractiveness and so on, appropriate type of road will be provided. Access control for conservation of tourism resources will also be provided. It is to be noted that wherever the road improvements take place, local residents in the service area should receives the highest benefit. Concept of access control system is shown on the following figure.

Figure 7.4.1 Conceptual Diagram of Access Control System

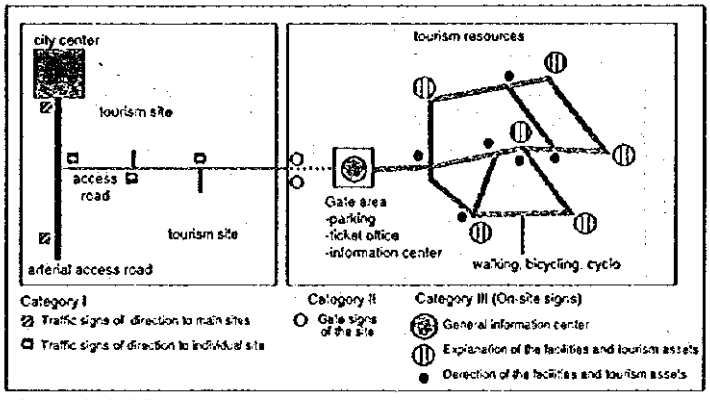


Source: JICA Study Team

(2) Sign and information system improvement

The information system consists of route guiding signs along access routes and information boards at tourist sites. Three types of signs and boards are designated. They are (1) traffic guide signs, (2) gate signs or entrance signs and (3) information boards at site. A conceptual information system is shown on the figure 7.4.2. The tourist information center is another significant means of tourism promotion relating to the information system. In this project the information center is included in the improvement of tourist service facilities described below.

Figure 7.4.2 Conceptual Diagram of Tourist Information System



Source: JICA Study Team

(3) Tourist service facilities and attractions development

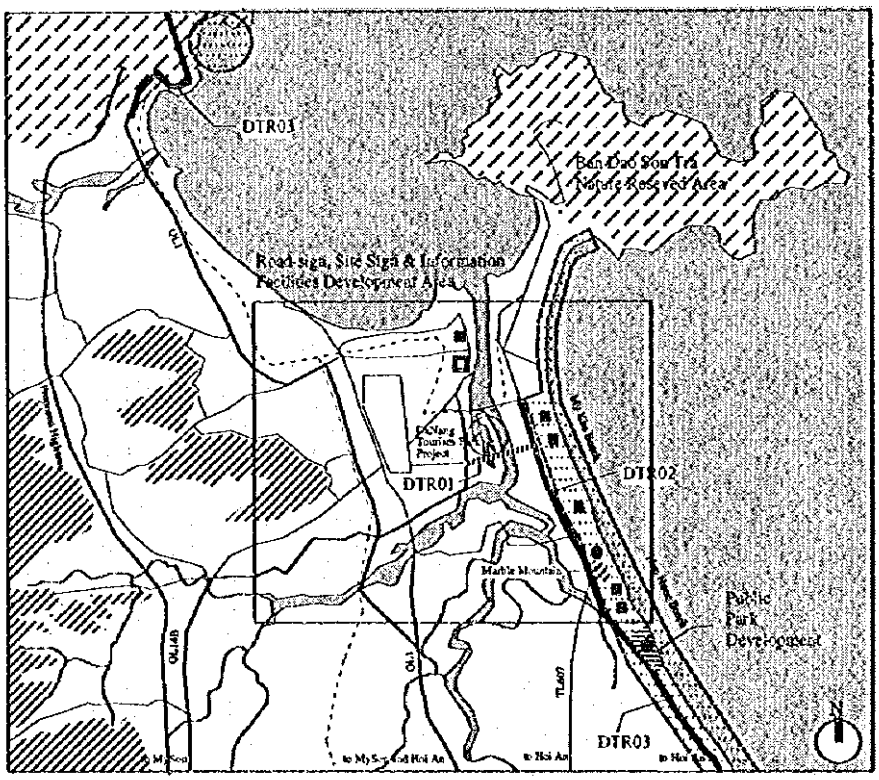
To create comfortable and enjoyable stay for tourists and residents in the tourism area service facilities such as tourist information centers, rest houses, parks and recreational areas, lighting and beautification of facilities will be provided in the priority development area.

(4) Operation and management improvement for environmental conservation

The development zoning system is proposed to maintain the environmentally sound and sustainable development. Introduction of the zoning system consist of three categories, that is, (1) nature preservation and conservation, (2) historical and cultural conservation, and (3) landscape control areas in city and town area are proposed.

The project locations are shown in following pages.

Figure 7.4.3 Tourism Infrastructure Improvement Project for Da Nang Center Priority Development Area



GENERAL PLANNING GUIDELINE proposals

- Da Nang Coast Resort Zone aimed at controlling disorganized coastal development
- Future Development Area for Coast Resort
- Nature Preservation Area

Existing Conditions

- Hotel / Resort Development Projects

TOURISM INFRASTRUCTURE IMPROVEMENT PROJECTS

Proposed Road Improvement (classification of road)

- Access Road Improvement
- New Bridge Costruction proposed by Local Authority

Proposed Tourism Facilities Improvement / Development

- Road-sign, Site Sign&Information Development
- Tourist Information Center
- Service Facilities (toilets, ticket booth, parking, and so on.)

Figure 7.4.4 Tourism Infrastructure Improvement Project for Hoi An - Cham Priority Development Area

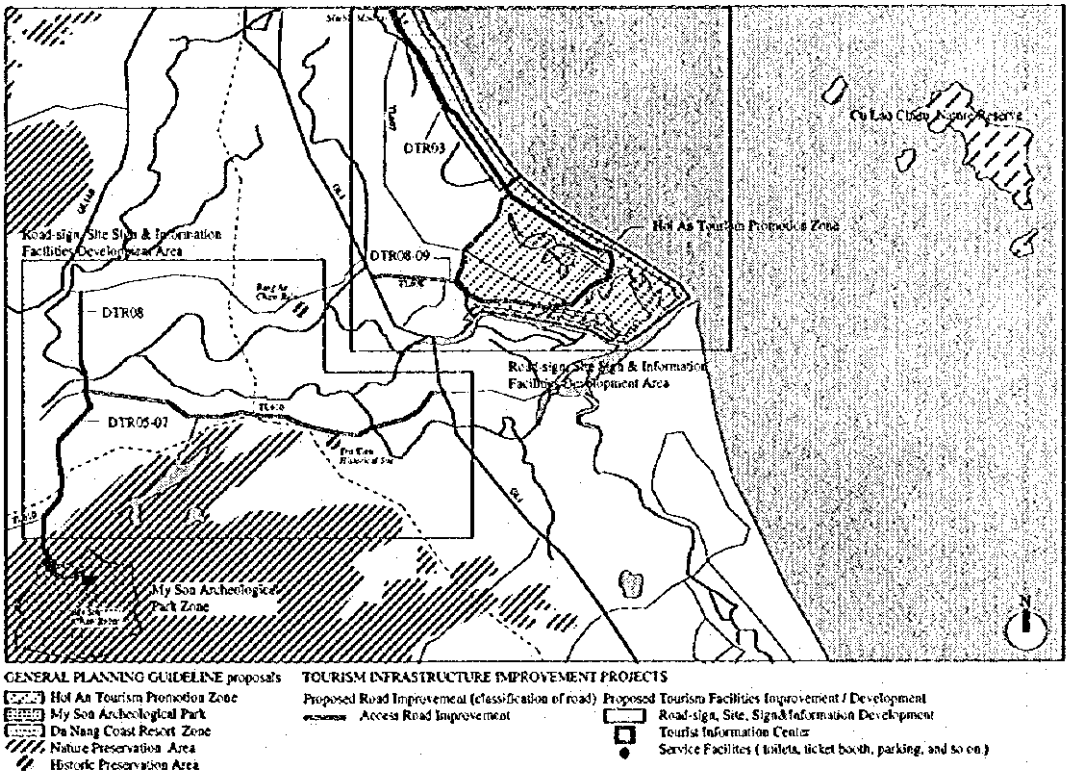


Figure 7.4.5 Tourism Infrastructure Improvement Project for Lang Co - Chan May and Bac Ma - Bana Priority Development Area

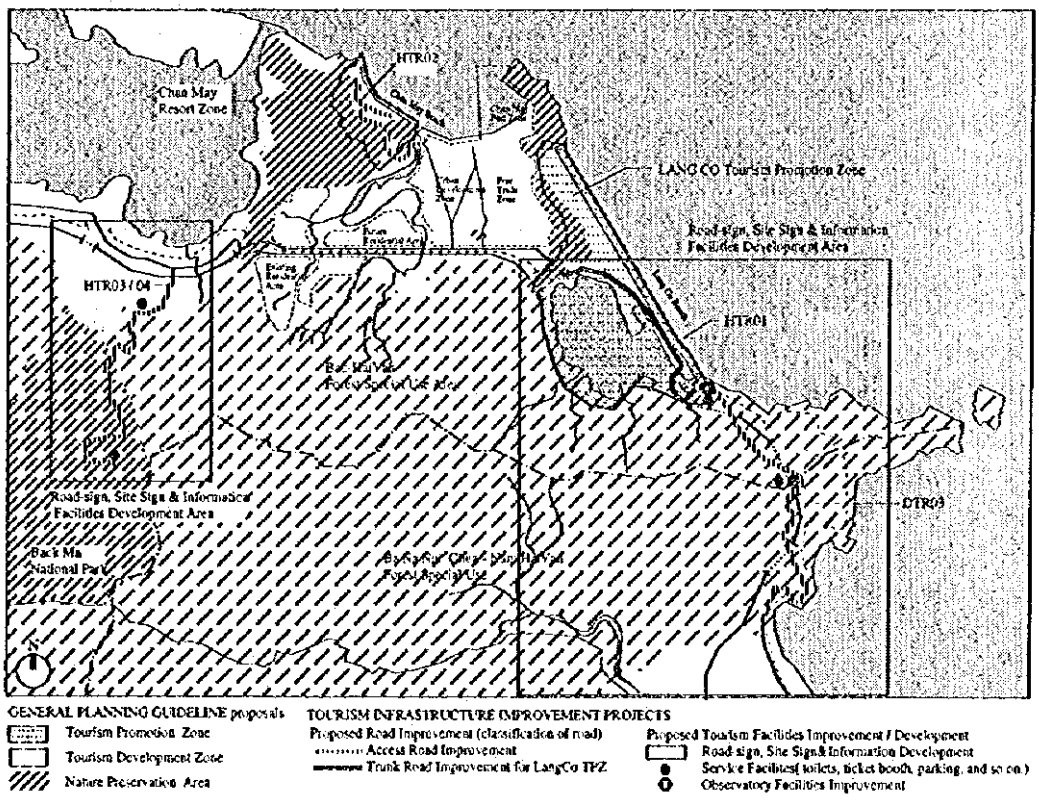
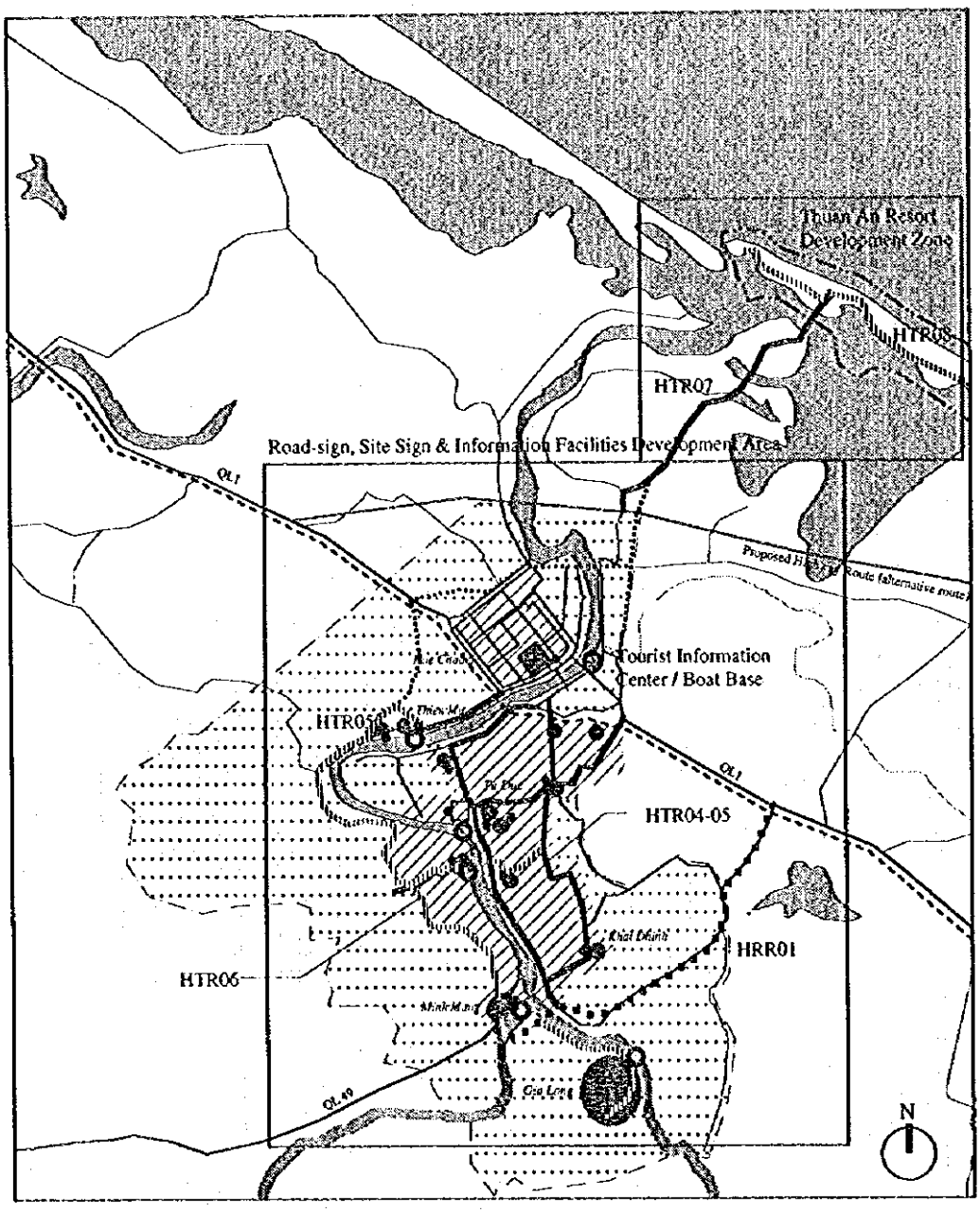


Figure 7.4.6 Tourism Infrastructure Improvement Project for Hue Historical Center Priority Development Area



GENERAL PLANNING GUIDELINE

Proposed Zoning System

- Historic Preservation Zone
- Historic Conservation Zone
- Historic-scape Safeguarding Zone
- Riverside Control Zone
- Roadside Control Zone

TOURISM INFRASTRUCTURE IMPROVEMENT PROJECTS

Proposed Road Improvement (classification of road)

- Main Access Road Improvement
- Sub-Access Road Improvement / Development
- QL49 By-pass Road Development

Proposed Tourism Facilities Improvement / Development

- Road-sign, Site Sign&Information Development
- Service Facilites (toilets, ticket booth, parking, and so on.)
- Jetty Improvement
- Historical Garden Museum Development

2) Project Cost and Implementation Schedule

The total project cost as a package of sub-projects amounts to 162.4 million US$, including the cost for engineering services and contingency, but excluding the land acquisition cost.

The project cost by phase is shown on the table below, and the implementation schedule by project component and location is shown in Figure 7.4.7.

Year	UP to 2000	2001 - 2005	2006 - 2010
Project Cost (million US $)	40.1	104.0	18.3
Accumulated Total Cost	40.1	144.1	162.4

Figure 7.4.7 Implementation Schedule of the Tourism Infrastructure Improvement Project

Destination Area	Tourism Devlnt Zone	Project code no.	category	cost 000. US$	short-term 1998 1999 2000	mid-term 2001 2002 2003 2004 2005	long-term 2006 2007 2008 2009 2010
DA NANG CENTER	Da Nang Gateway	DTR01	New Bridge at Han riv.	48,610			
		DTF01	Road sign, site sign & information	10			
		DTF02	Tourist Information Center	17			
	Da Nang Coast Resort	DTR02-03	Coast road improvemant	4,790			
		DTF-04	Road sign, site sign & information	8			
		DTF-05	Public park development	8,420			
		DTF-06	Marble Mt. facilities improvement	60			
	Hai Van	DTR04*	HaiVan Pass road improvement * (other project)	-			
		DTF03	Tourist facilities (rest house,etc.,)	50			
HOI AN-CHAM	My Son Archeological Park	DTR05-07	Road improvement for MySon access	12,000			
		DTR08	Substitutional road improvement to QL14B	4,080			
		DTF07	Road sign, site sign & information	13			
		DTF08	Park Facilities improvement	8,310			
	Hoi An TPZ	DTR09-10	Road improment from coast to QL1	8,010			
		DTR11	Extention to CuaDai Coast	2,720			
		DTR12	Road improment fromTL607 to Hoi An coast	1,200			
		DTF09	Road sign, site sign & information	19			
		DTF10	Tourist Information Center, parking	150			
LANG CO-CHAN MAY	Lang Co TPZ	HTR01	Road improment of QL1	12,320			
		HTF01	Road sign, site sign & information	6			
	Chan MAy Resort	HTR02	Road development to the resort area	5,080			
		HTF02	Road sign, site sign & information	5			
BACH MA-BANA	Mach Ma National Park	HTR03	Road improvement to the mountain	8,110			
		HTF03	Road sign, site sign & information	5			
		HTF04	Park Facilities development	50			
HUE HISTO-RICAL CENTER	Palace and Historic City	HTF05	Road sign, site sign & information	30			
		HTF06	Jetty and pier improvement	600			
		HTF07	Tourist Information Center	20			
		HTF08	Lighting-up	70			
	Historical Holy Gardon	HTR04	Road improvement for the historic city axis	1,750			
		HTR05	Road improvement for tombs,pagodas acess	10,580			
		HTR06	Road improvement for the tombs sub-acess	2,880			
		HRR01*	QL 49 By-pass development* (other project)	-			
		HTF09	Road sign, site sign & information	70			
		HTF10	Jetty and pier improvement	2,550			
		HTF11	Service Facilitiesdevelopment	2,820			
		HTF12	Holly Garden Museum (restaurant,office,etc)	210			
	Thuan An Resort	HTR07	Road improvement for ThuanAn coast acess	13,030			
		HTR08	Road improvement for beach roads	3,720			
		HTF13	Road sign, site sign & information	9			
		HTF14	Service Facilities improvement	15			
			Total Construction Cost	162,397			

Note: ——— Preparation Stage (survey,design,etc). ------ Costruction Stage

: * This project is described in the other sections.(HaiVan road to be improved by QL1 Rehabilitation Project)

Source: JICA Study Team

7.4.3 Tourism Promotion Zone Development Project (TPZ)

1) Structure of the Tourism Promotion Zone

(1) Land preparation and subdivision

The development body of the tourism promotion zone carries out land preparation and subdivides the land. For land preparation, tree felling must be minimized, in order to maintain the natural landscape, especially in forest areas.

(2) Building control

Building control should be carried out in the zone, in order not only to create an appropriate atmosphere for the tourism place, but also to protect against pollution and provide disaster prevention. Standards of building control should include the following points of view :

- Land use intensity control (floor-area ratio and so on)
- Landscape control (height control, setback, building line and so on), and
- Environment and disaster prevention (necessary equipment with capacity).

(3) Environment and sanitary infrastructure

To restrain pollution from the zone, sanitary infrastructure such as drainage system and waste disposal system should be provided by the public sector. For this end, the public sector should prepare the following facilities and infrastructure with a centralized system :

- Waste water collection main route
- Centralized waster water treatment facilities
- Waster water discharging facilities
- Garbage collection system, and
- Landfill site.

(4) Cost allocation of development

- Cost sharing of land preparation of commercial and public sites
- Cost allocation of preparation of basic infrastructure

(5) Preferential institutions in the Tourism Promotion Zone

Instead of relatively higher land cost and relatively strict environmental control adopted in the zone, taxation incentives should be prepared as outlined below :

- Preferential taxation for investment

Shortening of the depreciation period, preferential custom tax for certain import goods, and extension of the tax free period are considered

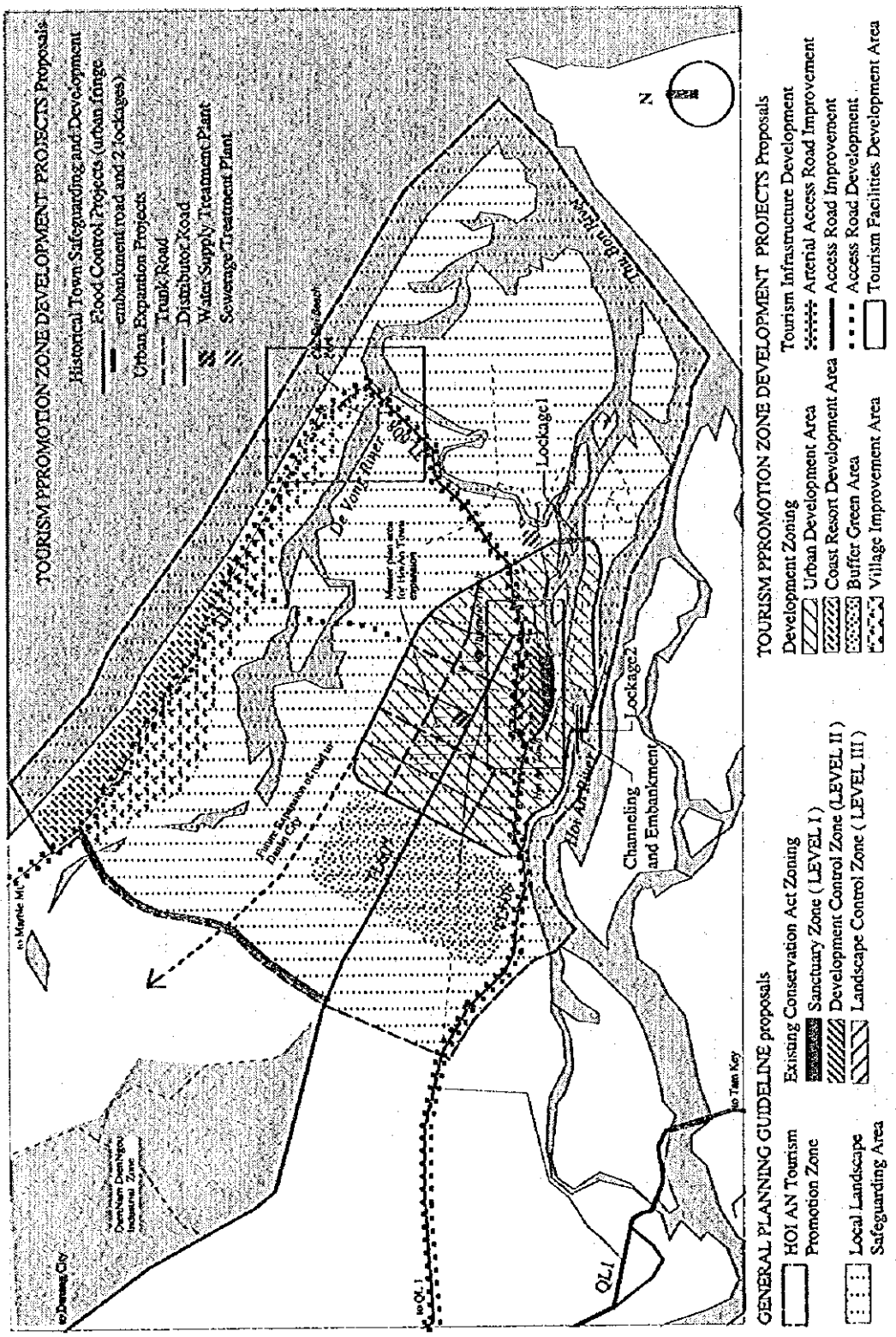
- Creation of preferable conditions for local medium and small firms

2) Hoi An Tourism Promotion Zone (TPZ) Development Project

Conservation of the historical town of Hoi An and creation of attractive cultural tourism town are the main objectives of this project. Accommodation facilities will be included as apart of

commercial facilities in the town. Other than these in-town accommodation facilities, the beach side will be developed for a tourist base in the future as a part of TPZ. The layout plan of the Hoi An TPZ is shown in the following figure.

Figure 7.4.8 Proposed Development Plan for Hoi An Tourism Promotion Zone

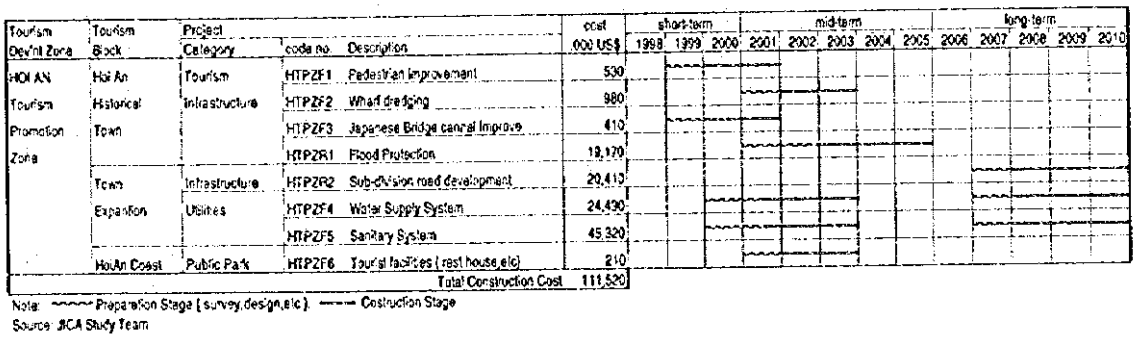


The total project cost amounts to 111.5 million US$, including the cost for engineering services and contingency, but excluding the land acquisition cost.

The project cost by phase is shown on the table below, and the implementation schedule by project component and location is shown in figure 7.4.9.

Year	UP to 2000	2001 - 2005	2006 - 2010
Project Cost (million US $)	3.3	65.5	42.7
Accumulated Total Cost	3.3	68.8	111.5

Figure 7.4.9 Implementation Schedule of the Hoi An TPZ



3) Lang Co Tourism Promotion Zone (TPZ) Development Project

Conservation of the natural environment of beach and lagoon is the most significant issue for this TPZ. Controlling the development to meet the environment standards requires to realize the sustainable use of resources. Lang Co is also the ideal location to formulate a tourist base, because of the proximity to the gateway city of Da Nang and the planned new city of Chang May. Hue Historical Center is also in a day trip destination.

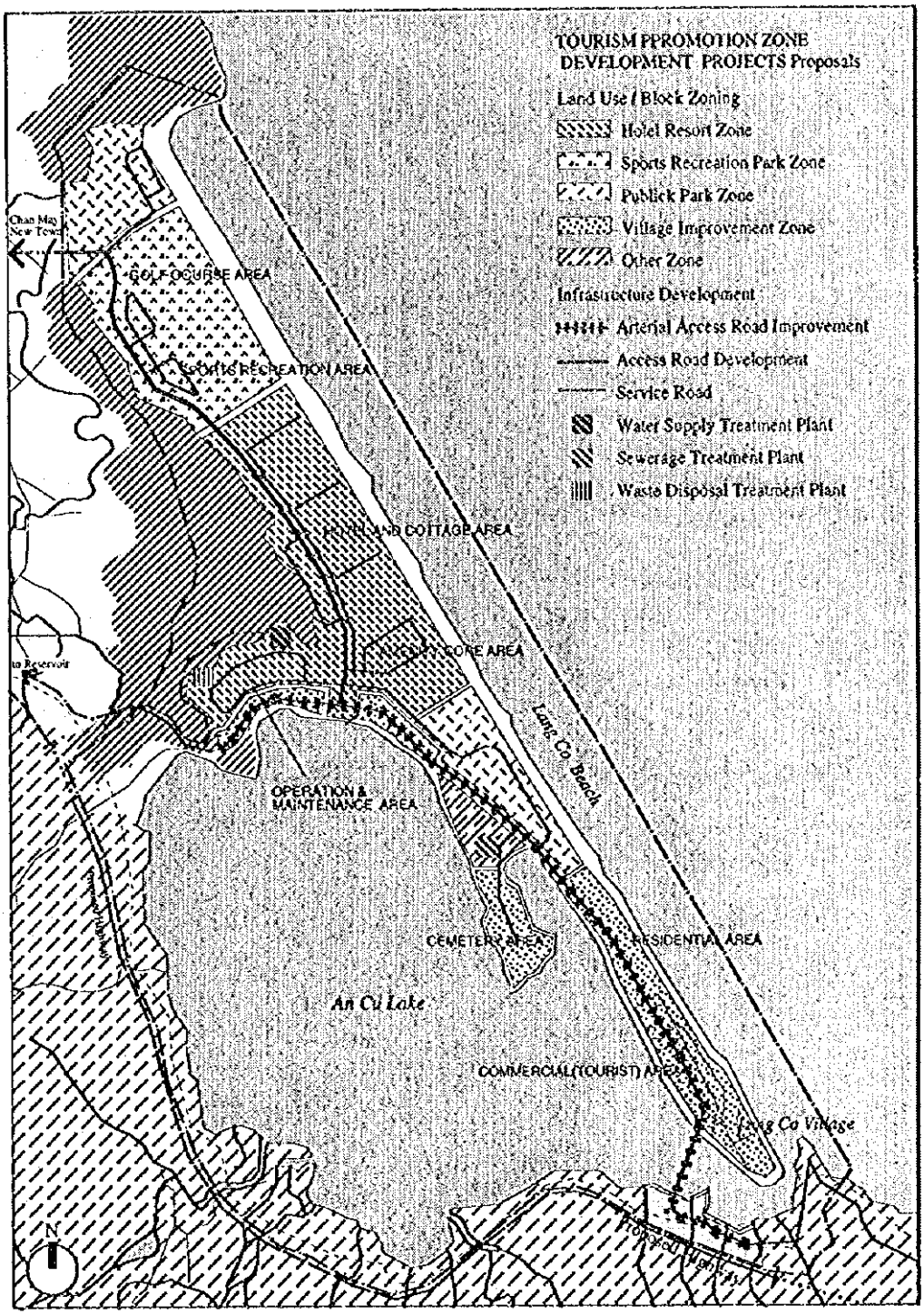
Control measures to be taken in the designated zones are summarized in the following figure.

Figure 7.4.10 Required Development Guideline and Control Measures

Development Control Measure and Guideline		Development Zone & Area						
		HOTEL RESORT	SPORTS PARK	PUBLIC PARK	OTHER	VILLAGE	ROAD SIDE	AN CU LAKE
Building	Height	☆	☆	☆	☆	★	☆	▲
	Usage	☆	▲	▲	▲	◆	☆	▲
	Coverage	☆	☆	★	☆	◆	☆	▲
	Setback	☆	▲	▲	▲	▲	☆	▲
Facilities	Design Standard	☆	☆	☆	◆	▲	◆	▲
	Bill Boards & Signs	☆	☆	☆		☆	☆	▲
	Planting Guide	☆	▲	▲	▲	◆	★	▲
Traffic Control	Access Control	★	◆	☆	▲	◆	★	▲
	Packing Design Standard	☆	☆	☆	▲	▲	★	▲
Environment Control	Beach Beautification	☆	☆	☆	▲	☆	▲	▲
	Waste Disposal Measure	☆	★	☆	▲	★	★	☆
	Noise	☆	▲	★	▲	▲	★	▲
	Sanitary Equipment	☆	☆	☆	▲	★	▲	☆

Note: ☆ = Compulsory, ★ = necessary, ◆ = desirable, ▲ = not applicable
Source: JICA Study Team

Figure 7.4.11 Proposed Development Plan for Lang Co Tourism Promotion Zone



GENERAL PLANNING GUIDELINE proposals

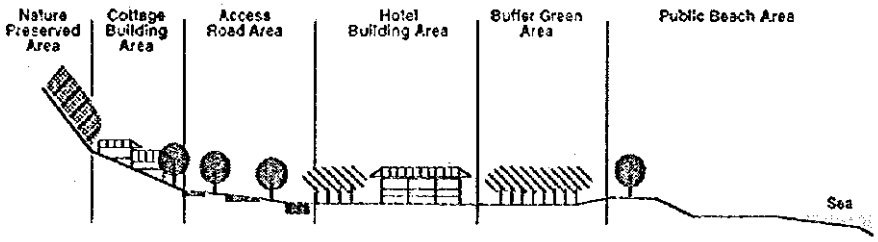
LANG CO Tourism Promotion Zone

Proposed Nature Preservation Area

Existing Forest Special Use Area
(Bach-Ma National Park buffer zone)

The Layout plan of the TPZ is shown in the Figure 7.4.11. The ty a hotel and cottage zone is shown bellow. The wind break along the coast shou d to prevent the coastal sand dune erosion.

Figure 7.4.12 Typical Section of Hotel and Cottage Area



The total project cost amounts to 119.4 million US$, including the cost for engineering services and contingency, but excluding the land acquisition cost.

The project cost by phase is shown on the table below, and the implementation schedule by project component and location is shown in Figure 7.4.13.

Year	UP to 2000	2001 - 2005	2006 - 2010
Project Cost (million US $)	5.9	78.7	37.0
Accumulated Total Cost	5.9	84.6	121.6

Figure 7.4.13 Implementation Schedule of the Lang Co TPZ

Tourism Devnt Zone	Tourism Block	Project Category	Code No.	Description	Cost 000 US$	short term 1998 1999 2000	mid-term 2001 2002 2003 2004 2005 2006	long term 2007 2008 2009 2010
LANG CO	Hotel	Hotel	LTPZF1	High class (300 rooms)	(41,100)			
Tourism	Resort		LTPZF2	Medium class (1,250rooms)	(85,630)			
Promotion	Block	Amenity Core	LTPZF3	Information, souvenir shop, etc.	(3,650)			
Zone		Operation Fac.	LTPZF4	Management, staff housing, etc.	1,450			
		Landscape, etc.	LTPZF5	Tree planting, land preparation	24,340			
	Sports Park	Golfcountry C	LTPZF6	18 holes, clubhouse, sportclub	(27,740)			
	Road	Roads develop	LTPZR1	Distributor roads, etc.	8,040			
	Public Park	Tourist Facil	LTPZF7	Rest service facilities, landscape	4,840			
	Village Imp	Road improve	LTPZR2	Road upgrading	500			
	Other Block	Utilities	LTPZF8	Water supply system	28,940			
			LTPZF9	Sanitary system	38,320			
			LTPZF10	Areal landscaping	12,600			
				Total Construction Cost	119,030			

Note: ~~~ Preparation Stage (survey, design etc.) ——— Construction Stage

Source: JICA Study Team