3.3 Beach Resort

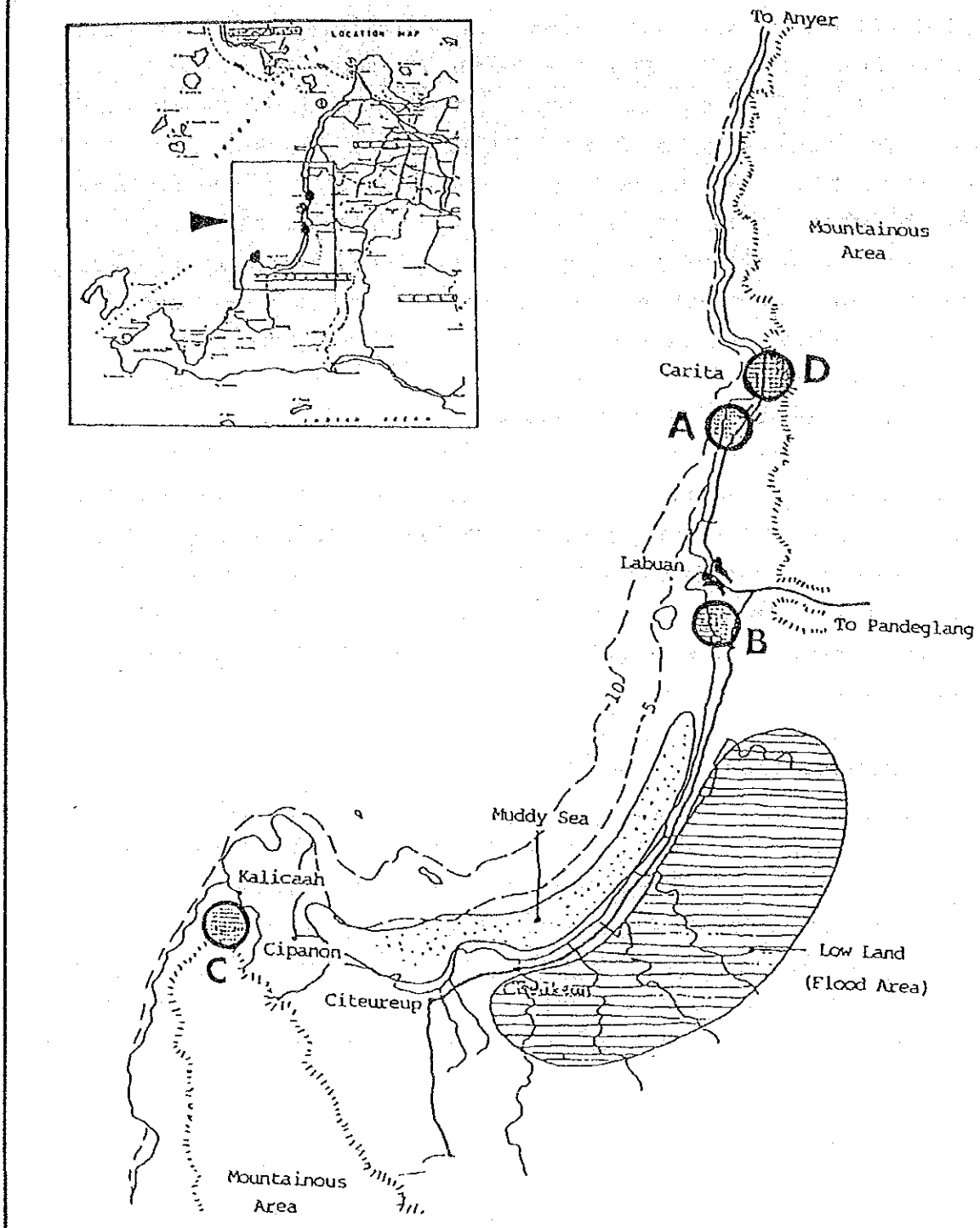
The JICA Study Team has studied four possible sites for the Beach Resort in the study region. They are shown in Fig. I(D)-7. After careful consideration of their merits and demerits, sites A and B were eliminated because of the presence of rocks on the beaches and muddy sea for the purpose of establishing a beach report. The remaining two sites, C and D, are respectively located on the Peninsula of Tanjung Lesung and on the coast at Carita Beach. Outlines of the two alternative sites are explained in the following sections.

1) Alternative Site "C" (Tanjung Lesung)

This site is located on the peninsula of Tanjung Lesung, about 30 km from the city of Labuan. Fig. I(D)-8 shows the present condition of the Site "C". The surrounding area is not developed and there are few inhabitants living in the area. The existing road leading to the site is unmotorable in parts.

a. Accessibility

The site is remote from the major tourist route and will take 30-40 minutes by car from Labuan. It will be necessary to construct about 6 km of new road, to pave about 7 km of existing road out of the 8 km section between Citeureup and Tanjung Jaya and to reconstruct 2 bridges to replace existing ones.



N

S=1:200,000

0 5 10 km

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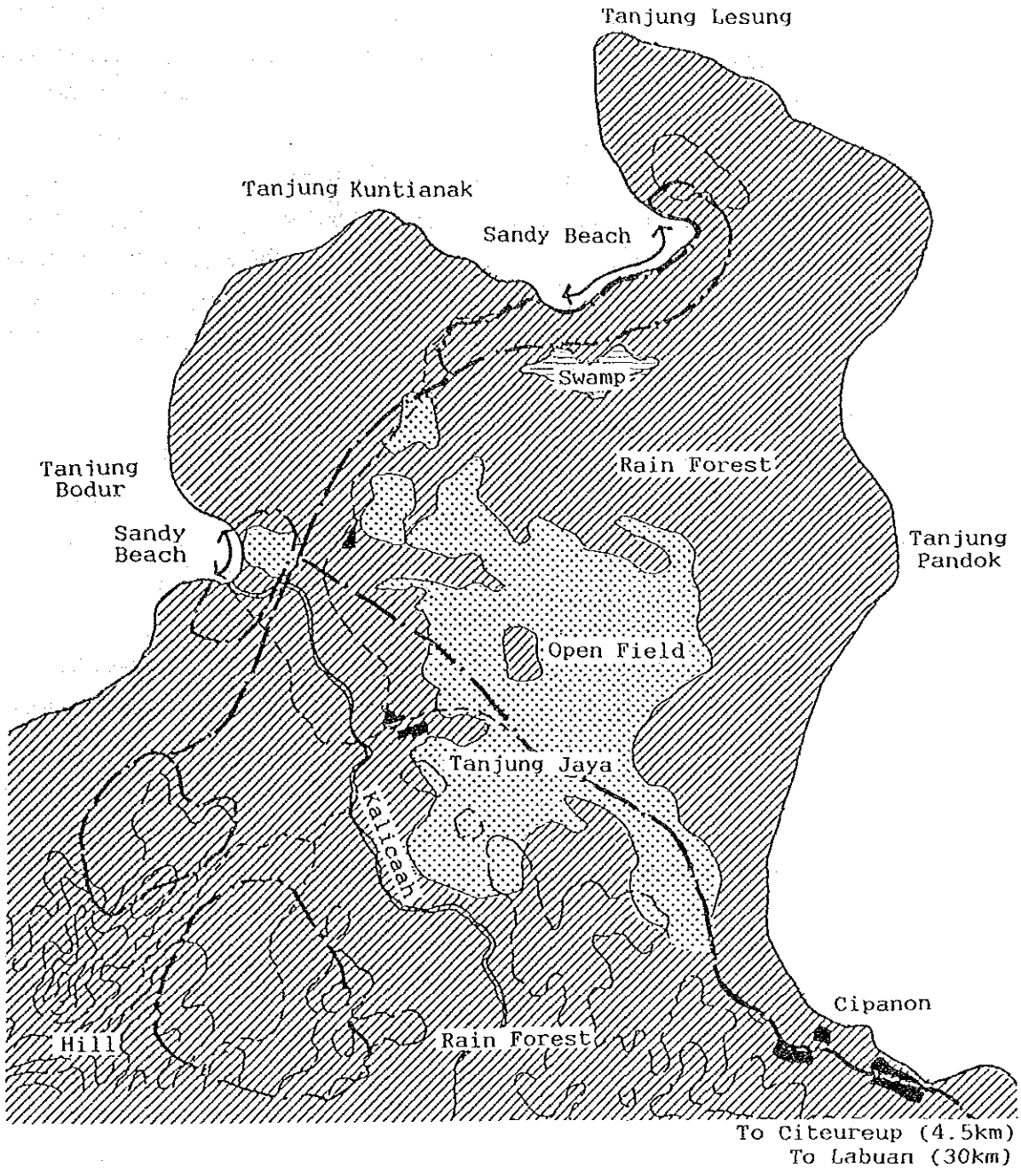
Fig. I(D)-7
ALTERNATIVE SITES OF BEACH RESORT



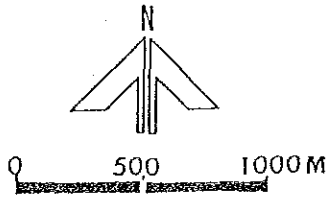


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Fig. I(D)-8
PRESENT CONDITION OF BEACH RESORT : SITE "C"

b. Land acquisition

As far as the ownership of land is concerned, most of the land in the area belongs to the government. Although there are some scattered houses in the area, it is thought that there will be no major problems for acquiring the land when necessary. In the present condition, the land price is estimated to cost about Rp. 500 per m^2. On the assumption that there will be need to purchase about 20% of the land required at the estimated price, the land acquisition cost will be:

186 ha (1,860,000 m^2) x 0.20 x Rp. 500/m^2
= Rp. 186 million

c. Physical condition

The topography of this area is almost flat and lowlying except for its southern part where it is covered by small hills. The site is mostly covered with natural rain forest. In parts of the area, there are open fields covered with grass and bushes or with both. The land along the existing non-paved road is partly used as paddy fields and for coconut planting.

The area around this site has enough land for possible future expansion. It is surrounded by unspoiled nature providing an excellent scenic view. The beach along the coast is covered with white sand although it is not so wide nor long. The beach is divided into two parts, one of 300 m in length and the other of about 800 m. The purity of sea water seems excellent.

d. Amenities in surrounding environment

The surrounding area is still undeveloped and almost unspoiled by human intrusion. Visitors can enjoy the

natural conditions of the sea, mountains, plains and its existing fauna and flora.

e. Effects on regional development

Due to the remoteness of the area, its contribution to the regional development will not be as much as at other sites. However, with a new motorable road connecting with the existing road, it may possibly revitalize the fisheries industry in the villages along the neighbouring coastline.

f. Impact on natural environment

As the area is scarcely populated, tourist development will cause some changes in the natural environment. Attention should be given to existing habitats of fauna and flora, particularly those in the rain forests.

g. Socio-cultural impact

The area is difficult of access with the population living in a few scattered villages with no noticeable recreational facilities.

Although the construction of recreational facilities in the area may affect to some extent their way of living, it is thought that no direct impact will be brought to the social and cultural environment of the area as the development site itself does not cover the existing villages.

h. Development cost

Excluding the cost of land, the development cost of a beach resort in this area is estimated to amount to be between Rp. 52 billion and 64 billion.

2) Alternative Site "D" (Carita Beach Site)

This site is located along the coast at Carita Beach. Fig. I(D)-9 shows the present condition of Site "D". Most of the area along this beach has been already developed by private developers. The area has become famous among vacationers and it is known as Pantai Carita.

a. Accessibility

The site is located along the existing road between Anyer and Labuan. As far as accessibility is concerned, this site can be reached easily by car.

b. To develop this site into a beach resort, it is necessary to acquire land to relocate the existing road and also for the relocation of houses that will be displaced to make way for the facilities of the beach resort. It may be necessary to negotiate with the owners on land and properties compensation.

Land prices around this area along the coast are assumed to be between Rp. 12,000 and 15,000 per m^2. The land price inland area for the construction of the second house village and the golf course is estimated to be about 50% and 20% less respectively than land along the beach. The land costs alone will amount to between Rp. 12 and 15 billion.

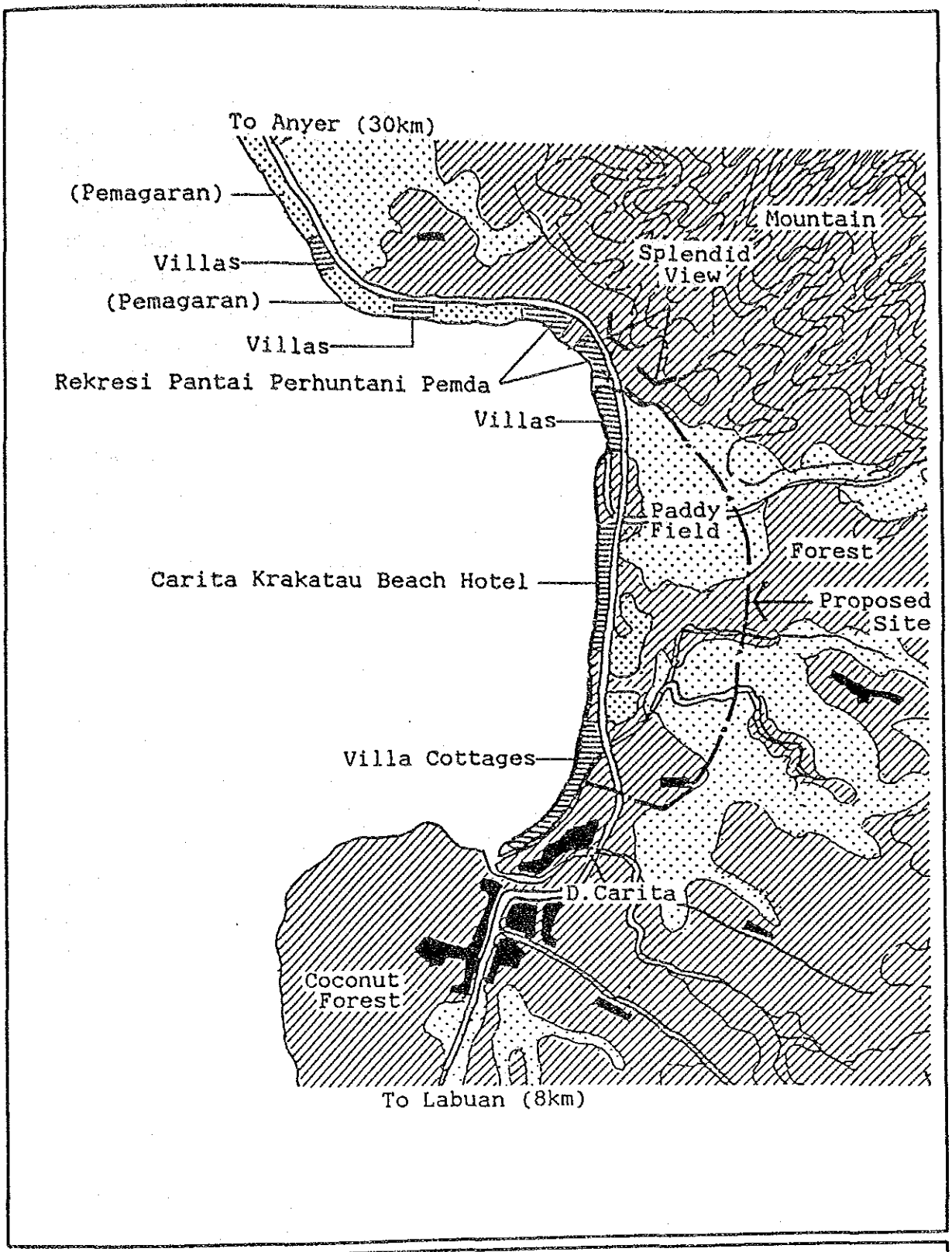

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Fig. I(D)-9

PRESENT CONDITION OF BEACH RESORT : SITE "D"

c. Physical condition

The topography around the Carita Beach is almost flat. There are three rivers in the southern part of the area. Behind the northern part are of hills. About half of the proposed site is being used at present for paddy fields. The remainder is covered with coconut trees and bushes. Within this area, there are few possibilities for future expansion except in the direction of the inner hills in the north.

The view from this site is good and it becomes better from the hills behind where one can get a splendid view of the whole bay. The beach is sandy and has a length of about 2 km. The purity of sea water seems to be good and up to international resort standard.

d. Amenities in the surrounding environment

The inland zone possesses a variety of natural features such as rivers, open fields and hills. There is a village next to the southern part of the area which may disturb the atmosphere of a high-grade resort. On the other hand, such village could provide local color to the area and gives visitors a chance to acquaint themselves with the way of life of local people in the country.

e. Effects on regional environments

The construction of a beach resort will contribute to economic improvement of the area by providing employment opportunities to local people, providing new markets for local products. The construction of new roads, sewage treatment plant, water supply facilities and other amenities will improve the social and sanitary conditions of the area. Such improvements should be emphasized when negotiating with local

people in the acquisition of private land and properties.

f. Impacts on natural environment

Most of the area around Carita beach has been developed and much of the land is covered with newly planted trees and new vegetation. So far no serious problems seem to have arisen from the development realized in this area.

g. Socio-cultural impact

For developing a beach resort in this area, it will be necessary to acquire the necessary land from private land owners. It is anticipated that a large number of people will be involved and will have to move. On the other hand, as the area has been gradually developed for tourism by private entrepreneurs, the attitude of the local people toward this kind of development cannot be considered as a negative one.

h. Development cost

The development cost of a beach resort at the Carita Beach site, excluding the cost of land, is roughly estimated to be between Rp. 61 and 75 billion. This rough estimation was made based on the schematic plan given in this report.

3) Rating of Beach Resort Sites

The JICA Study Team has evaluated the prospects of alternative sites C and D for the Beach Resort taking into account the various items mentioned in the preceding sections.

Each item was given rating points from 5 points for excellent to 1 point for difficult. Besides the simple aggregated total points given to each site, the Study Team has also given a weighted rate aggregated score to each site based on the weighting of items agreed upon with the DGT. The weighting of items was made as follows:

3 points for:
- Physical condition
- Effect on the regional development
- Impact on natural environment
- Impact on socio-cultural aspect

2 points for:
- Land acquisition
- Amenity of surrounding environment

1 point for:
- Accessibility
- Development cost

Table I(D)-3 shows the results of the score given to each site with their total. From these results, the site at Tanjung Lesung for the future beach resort or Alternative Site C was given a higher score than the Carita Beach Resort site or Alternative D. From a technical point of view, the JICA Study Team recommend that Site C at Tanjung Lesung be retained for the development of a Beach Resort in the project area.

During the next phase of the study, the JICA Study Team will undertake a more detailed assessment of the impacts on natural and socio-cultural conditions of the selected site.

Table I(D)-3 RATING OF ALTERNATIVE SITES
(BEACH RESORT)

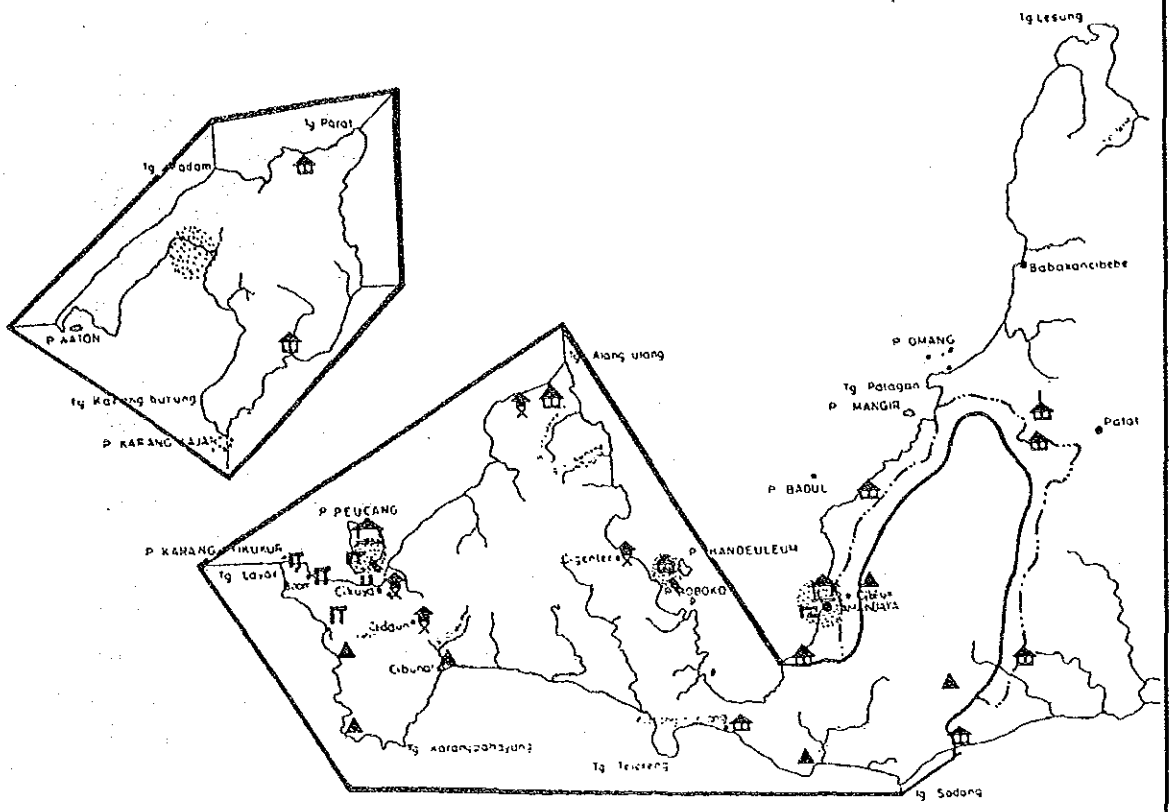
Items	Alternative C (Tg. Lesung)		Alternative D (Carita)	
Accessibility	For from major tourist route	2	Excellent	5
Land Acquisition	Easy	5	Rather difficult	2
Arrangement cost	Rp.186 million	5	Rp.12-15 billion	1
Physical Condition				
Land form	Flat, low	5	Flat, partly low and hilly	5
Plantation	Rain forest, open field	5	Coconut trees, paddy field	3
Space	Extensive	5	Limited	3
Scenery	Excellent	5	Good	4
Beach	Sandy, partly rocky. Sandy beach is short	3	Sandy, long	5
Purity of the sea water	Excellent	5	Good	4
Amenity of Surrounding Environment	Excellent in nature beauty	5	Nature is good. Local village exists.	4
Effects on Regional Development	Rather poor	2	Excellent	5
Impact on Natural Environment	Possibility of disturbing existing fauna	3	Nothing serious	4
Socio-Cultural Impact	Possible big change but likely to be small	4	Some replacement of housing needed, but social damage seems not to be serious	4
Development Cost	Rp.52-64 billion	5	Rp.61-75 billion	4
Total Rating Points (Simple)		59		53
Total Rating Points (Weighted)		148		134

3.4 Ujung Kulon and Krakatau Islands

Located in the south-western part of the study region [see Fig. I(D)-10], the Ujung Kulon National Park has been attracting some 1,000-2,000 people per year, of which around 20% came for research and others for recreation [refer to Tables I(D)-4 and I(D)-5].

As for the site for additional (new) guest house, it will be selected in Panaitan Island [see Fig. I(D)-1]. The location of the guest house, jetty and footpath is to be fixed in accordance with the master plan of PHPA.

The cruising and observation base for Krakatau Islands is recommended to be integrated in "Beach Resort" and it will be constructed near the town of Labuan in conformity with the master plan of Labuan city [as for the outline of Krakatau Islands, refer to Fig. I(D)-12].



Ujung Kulon National Park

Boundary of buffer zone area of UK National Park

National Park office, information center

Observation center, information room, small official guest house

Proposed shelter and camping areas

Observation tower

Moorage, small harbour

District post

Guard post

Area to be developed for tourism

Source : Proposed Ujung Kulon National Park Management Plan, 1977-1981.

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Fig. I(D)-10
INFRASTRUCTURE DEVELOPMENT PLAN IN UJUNG KULON

Non-scale

Table I(D)-4 NUMBER OF VISITORS TO UJUNG KULON

Year	Domestic	Foreign	Total
1971	132	111	243
1972	132	94	226
1973	108	7	115
1974	39	173	212
1975	88	174	262
1976	184	170	354
1977	880	278	1,158
1978	-	-	-
1979	-	-	-
1980	-	-	-
1981	574	214	788
1982	659	250	909
1983	872	333	1,205
1984	2,894	1,140	4,034
1985	1,431	756	2,187
1986	1,479	715	2,194

Table I(D)-5 TRAVEL MOTIVATION OF VISITORS COMING TO UJUNG KULON NATIONAL PARK IN 1986

	Domestic	Foreign	Total
1. Recreation	1,033	703	1,736
2. Education	-	-	-
3. Camping	-	-	-
4. Research	391	12	403
5. Others	55	-	55
Total	1,479	715	2,194

Source: Direktorat Taman Nasional Dan Hutan Wisata

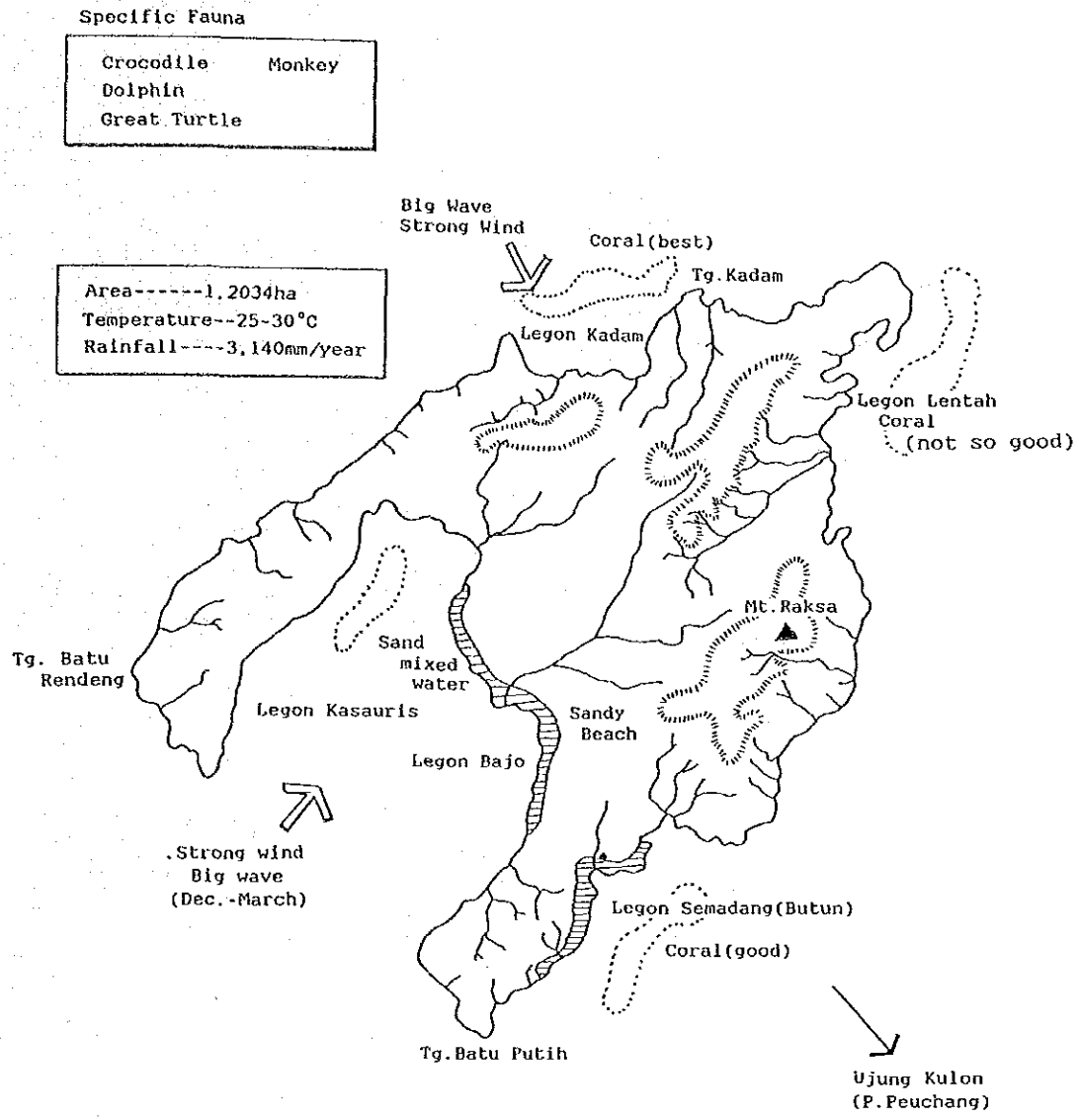

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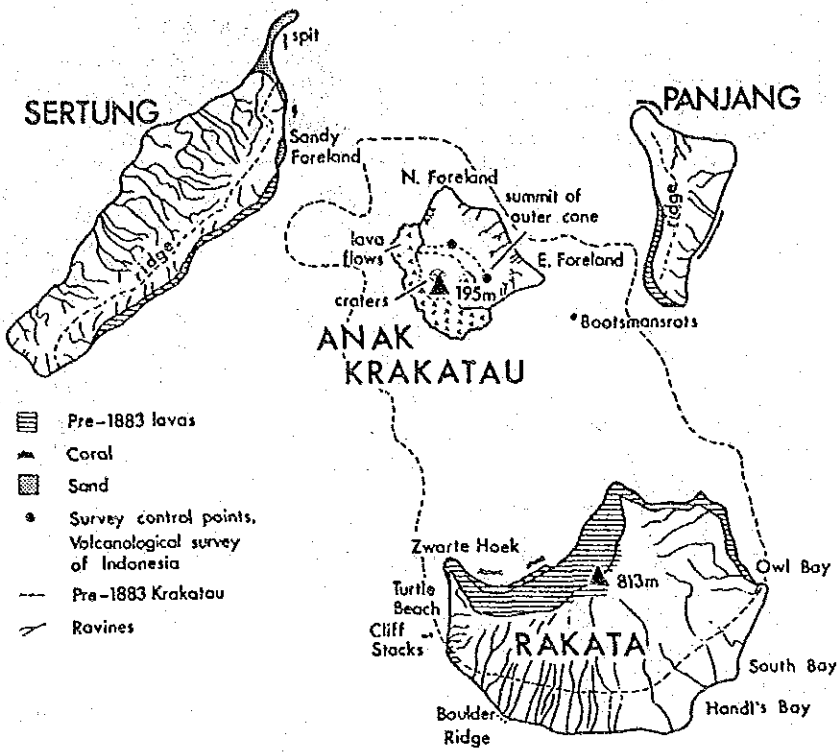
Fig. I(D)-11

PRESENT CONDITION OF PANAITAN ISLAND



Source : Zoological Expedition to the Krakataus, IWB Thornton, 1985.

0 1 2
km

N

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Fig. I(D)-12
KRAKATAU ISLANDS, 1985

ANNEX I (E)

TOURISM DEMAND AND PLANNING

ANNEX I(E)

TOURISM DEMAND AND PLANNING

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CHAPTER 1 APPROACH TO TOURISM DEMAND PROJECTION

To project the tourism demand at tourist objective levels, there are the following three types of approaches.

- Mono-step approach
- Bi-step approach
- Tri-step approach

The above types are characterized by the number of steps to be taken in the process of study.

1) Mono-step approach

In this approach, the tourism demand can be projected in one step of calculation by the following models:

(1) Time-series trend model

This model is formulated, based on the regression analysis of the past time-series trend of visitor arrivals in the tourist objects concerned, as follows:

$$F(t) = at + b$$
$$F(t) = at^2 + bt + c$$
$$F(t) = F(0) \times (1 + r)^t$$

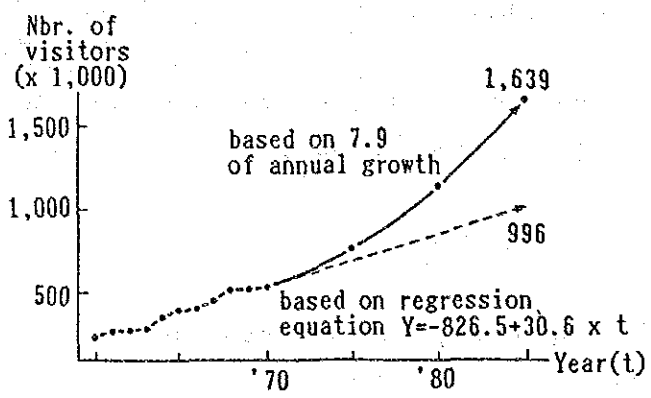
F(t) : Tourism demand in year t
F(0) : Tourism demand in standard year
r : Annual growth rate
a,b,c : Parameter

It is easy to project the demand with the model above, but the model has the defects such as;

- Inapplicability in case of new objects,

- Impossibility of considering the changes in the related factors in future, such as growth of economy, changes in people's preferences for tourism and development of other competitive objects.

Example of projection by time-series trend model



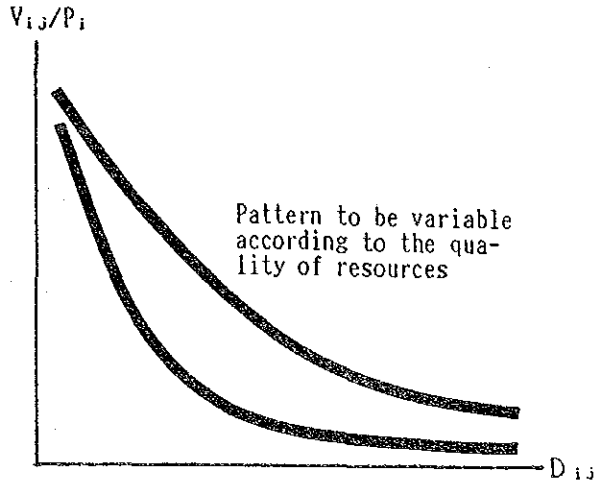
(2) Gravity model

Gravity model aims at explaining the quantum of visitor arrivals mainly in terms of approach conditions from origins as presented below.

$$V_{ij}./P_i = a/D_{ij}^{b}$$

V_{ij} : Number of visitors from origin i to destination j
P_i : Population in origin i
D_{ij} : Distance from i to j (hour or km)
a, b : Parameter

Pattern of frequency of visitor arrivals
by gravity model



Consequently, tourism demand can be calculated by the following equation:

$$V.j = \sum_{i}^{i} V_{ij} = a\sum_{i}^{i} P_i/D_{ij}^{b}$$

V.j : Tourism demand for destination j

Although it is said that the parameters of this model can explain the attractiveness of tourism resources, the estimation of future value will be rather difficult.

It, however, is possible to take into consideration the competitive situation among the related tourist objects, if it applied in the form of complete origin and destination table and followed by the additional process of "Total Check" formulated as:

$$V_{ij} = a \times P_i / D_{ij}^{b}$$

$$R_i = c_i \times P_i / (a \times P_i \times \sum_{j} 1/D_{ij})$$

$$= c_i (a \times \sum_{j} 1/D_{ij}^{b})$$

$$V'_{ij} = R_i \times V_{ij}$$

$$V'_{\cdot j} = \sum_{i} V'_{ij}$$

V_{ij} : Initially projected tourism demand from i to j

V'_{ij} : Adjusted tourism demand

R_i : Adjustment coefficient for tourism demand from i

C_i : Average number of annual trips per person

Example of projection by gravity model
(Tourism demand by region in Japan)

	a	b	C.C.
Hokkaido	395.30	3.45	0.95
Tohoku	98.50	3.27	0.96
Kantou	2.27	1.54	0.88
Hokuriku	18.89	2.82	0.86
Toukai	1.10	1.49	0.78
Kinki	1.13	1.59	0.86
Chugoku	2.98	2.20	0.94
Shikoku	0.99	1.96	0.94
Kyushu	4.68	3.00	0.91

C.C.: Correlation coefficient

It may not be workable in the projection at tourist object level, as it requires a large quantity of data and their processing.

In this context, this model is often applied as "Distribution Model" for nationwide projection and/or as "Assignment Model" for region-wide projection, following the preceding process of "Distribution Model".

(3) Factor analysis model

Based on the idea that tourism demand for tourism objects is to be effected by the conditions of the market, approach and resources, factor analysis model is formulated with the following equation:

$$V_{\cdot j} = a + b_1X_1 + b_2X_2 + \ldots + b_iX_i$$

X_i : Explanatory variable
a, b_i : parameter

Example of projection by factor analysis model

Factor	Category	Score of category
Scale of object	1 Large	-201.559
	2 medium	145.520
	3 small	-151.086
Attractiveness or object (scale of market)	4 nationwide	1,431.913
	5 region-wide	-467.590
	6 local	40.192
Character of resource	7 nature	-528.320
	8 human	-353.452
	9 others	521.474
Accommodation	10 large	2,352.065
	11 medium	-353.452
	12 small	521.474
Approach	13 trunk road	607.337
	14 Others	-425.137

Correlation efficient: 0.74

Therefore, it easily reflect changes in the related factors in future, but is hardly applied in case of the new types of objects because of the limitation of inductive approach.

Furthermore, it is also difficult to take into consideration the competition among the related destinations as pointed out in the previous models, if not followed by the process of the above "Total Check".

(4) Opportunity model

This model originally developed in transportation planning is based on the idea that more visitors will be attracted to the tourist destinations with;

- less distance from the specific markets,
- fewer objects en route from the above markets, and
- better and more resources in sites.

It, in general, is formulated as;

$$V_{ij} = V_i \cdot \times (e^{-L \cdot s(j-i)} - e^{-L \cdot s(j)})$$

Vi : Tourism demand generated in i
S(j) : Aggregative resources located between i and j
e : Exponential
L : Parameter

Although this model is said to be more logical than gravity model, it has some defects such as the complication of the process in calculation and the difficulty in the estimation of the parameter in future.

(5) Others

Besides the aforementioned models, there are two types of models comprising probability model and capacity oriented model.

The former is not settled in tourism planning, in spite of its logical theory, due to complication of its process.

On the other hand, the latter will be effective, when the number of visitors in a peak day is limited within the carrying capacity of the resources. Also, it can be applied in an easier way.

It is formulated, as shown below, based on the experiential theory that the peak ratio of number of daily visitor arrivals to that of yearly ones will be within a certain range according to the characteristics of the destinations.

$$V._j = pr \times Vmax_j$$

$V._j$: Yearly tourism demand

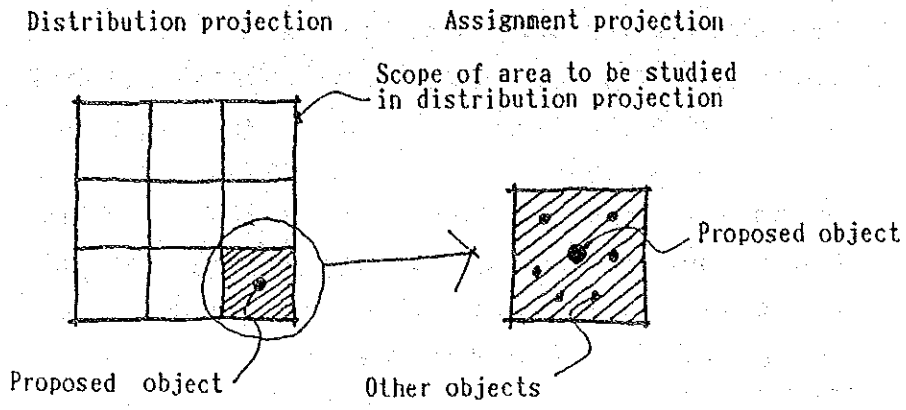
pr : Peak ratio of number of daily visitor arrivals to that of yearly ones

$Vmax_j$: Maximal number of daily visitor arrivals within the carrying capacity (refer to "METHODOLOGY OF STUDY ON CARRYING CAPACITY")

2) Multi-step approach

If many explanatory variables are requested to be adopted to take into consideration significant factors and/or the study is needed to cover wide area to pay an attention to other related destinations, projection work will be complicated for mono-step approaches.

Multi-step approach aims at narrowing down the scope of area to be studied in detail in the succeeding step (assignment projection) through a rough study over wider area in the preceding step (distribution projection).



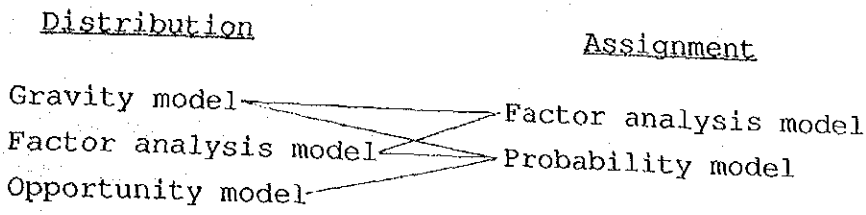
Bi-step approach consists of the aforementioned two steps, that is, distribution projection and assignment projection, while tri-step approach includes generation projection carried out ahead of the above two steps for the aforementioned "Total Check".

(1) Bi-step approach

In this approach, as noted above, distribution projection will be made in advance and followed by assignment projection.

The followings are representative combinations of models to be adopted in the projection.

Combination of models in bi-step approach



Although explanatory variables are differentiated according to the phases of study, the forms of models are the same as those presented before.

Example of factors to be adopted for projection

Factor	Specified by	
	Distribution projection	Assignment projection
Accommodation	Category (Ex. - 200 beds, 201 - 400, 401 -)	Actually carrying capacity
Transportation	Road (Time) distance between core places in both origin & destination zones	Road (Time) distance between core places of zone and objects
Resource	Aggregative score $\sum_{i}^{i} \omega_i \times n_i$ ω_i: Weight for resources of rank i n_i: Number of resources of rank i	Scale and quality

(2) Tri-step approach

Generation projection will be made ahead of the above two steps in this approach, mainly aiming at taking into consideration the changes in the pattern of tourism demand generation and "Total Check", through

which aggregative quantum of tourism demand by tourism object will be adjusted not to exceed the total quantum of tourism generation.

In generation projection, factor analysis model and time-series trend model are often applied, but the former is more logical.

In general, the followings are adopted for the explanatory variables in factor analysis generation model:

- Age
- Sex and marriage
- Place of residence (urban, rural, etc.)
- Household income
- Ownership of car
- Leisure time

The generation model can be formulated based on the original data of the survey carried out by BPS in 1984, if available.

Generation projection is desirable to be made by activity because of the difference of behaviors among activities.

The aggregative quantum of tourism demand generation by region or zone will be the control total for the aggregative quantum of tourism distribution and also of assignment, as mentioned before.

Table I(E)-1 POPULATION DISTRIBUTION BY AGE GROUP AND SEX

(Unit: thousand)

	1985		1990		2000		2010	
	Male	Female	Male	Female	Male	Female	Male	Female
West Java								
0 - 9	4,513.2	4,362.1	4,574.2	4,442.3	4,662.1	4,503.4	4,514.3	4,355.5
10 - 14	1,913.3	1,855.4	2,144.7	2,064.2	2,223.1	2,159.4	2,311.9	2,232.0
15 - 24	3,024.4	3,011.0	3,505.9	3,430.1	4,293.3	4,166.8	4,486.4	4,358.3
25 - 49	4,387.7	4,528.1	4,971.6	5,116.6	6,702.9	6,779.6	8,611.7	8,506.8
50 & Over	1,586.2	1,793.7	1,882.5	2,156.0	2,532.2	2,924.0	3,569.4	4,160.5
Total	15,424.8	15,550.3	17,078.9	17,209.2	20,413.6	20,533.2	23,493.7	23,613.1
DKI Jakarta								
0 - 9	1,104.8	1,068.5	1,223.1	1,190.3	1,418.9	1,375.3	1,588.0	1,535.0
10 - 14	448.3	434.7	553.3	531.3	685.2	666.4	796.0	769.3
15 - 24	762.6	809.2	872.1	875.1	1,290.4	1,240.9	1,536.0	1,492.2
25 - 49	1,375.2	1,269.3	1,655.7	1,598.9	2,254.5	2,248.8	2,920.6	2,942.3
50 & Over	302.8	315.0	437.9	443.5	810.8	816.0	1,556.6	1,564.8
Total	3,993.7	3,896.7	4,742.1	4,639.1	6,459.8	6,347.4	8,397.2	8,303.6
Central Java								
0 - 9	3,521.2	3,410.9	3,516.4	3,403.9	3,509.2	3,382.6	3,180.5	3,133.2
10 - 14	1,572.6	1,537.8	1,637.7	1,590.3	1,640.8	1,589.9	1,626.0	1,567.2
15 - 24	2,783.2	2,778.0	2,898.7	2,864.6	3,042.9	2,962.4	3,062.4	2,968.9
25 - 49	3,803.7	4,138.6	4,269.4	4,512.0	5,402.0	5,485.2	6,199.0	6,151.5
50 & Over	1,688.7	1,910.0	1,880.2	2,205.6	2,126.9	2,609.0	2,719.1	3,288.6
Total	13,369.4	13,775.3	14,202.4	14,576.4	15,721.8	16,029.1	16,787.0	17,109.4
DI Yogyakarta								
0 - 9	327.2	313.8	358.0	345.7	379.2	392.2	413.4	432.4
10 - 14	155.3	149.4	156.5	149.4	181.4	186.9	175.3	207.6
15 - 24	306.6	300.5	308.5	301.3	313.6	321.6	334.0	407.0
25 - 49	454.3	474.5	529.5	537.9	686.1	672.3	731.4	390.7
50 & Over	227.1	281.0	251.0	313.9	349.6	304.6	462.1	767.8
Total	1,470.5	1,519.2	1,603.5	1,648.2	1,909.9	1,877.6	2,116.2	2,205.5
East java								
0 - 9	3,696.0	3,534.6	3,811.5	3,688.7	3,838.5	3,700.4	3,707.5	3,570.4
10 - 14	1,769.7	1,719.7	1,743.0	1,648.8	1,859.7	1,801.4	1,796.9	1,731.5
15 - 24	3,120.6	3,096.4	3,325.0	3,258.3	3,357.2	3,226.7	3,564.2	3,455.8
25 - 49	4,748.6	5,107.4	5,246.9	5,514.6	6,506.4	6,602.0	7,450.5	7,334.7
50 & Over	2,002.2	2,485.8	2,289.4	2,853.7	2,777.3	3,457.5	3,610.3	4,406.0
Total	15,337.1	15,943.9	16,415.8	16,964.1	18,339.1	18,788.0	20,129.4	20,498.4

Source: 1985-2000 Proyeksi Penduduk Indonesia 1980 - 2000 by BPS, and
2010 - JICA Study Team projections

Table I-(E)-2 NUMBER OF VISITOR ARRIVALS IN THE STUDY REGION BY ACTIVITY IN 1984

(1,000 person-visits)

Activity	Visitors by destination			Visitors by activity
Beach	Salira Beach	84 *1		293x2/3x0.99=193 *2
	Pulorida	15		(25x0.9x0.9=20) *4
Marine	Anyer	11 (6) *4	293 *4 (25)	293x2/3x0.01=2
	Karang Bolong	99		(25x0.9x0.1=2) *4
Outdoor Recreation	Charita	27(14) *4		293x1/3=98
	Others	57 (5) *4		(25x0.1=3) *4
Nature Observation	Krakatau Is. / Ujung Kulon	3 (1) *4	5 *4 (2)	5 *4 (2)
	Pulau Dua	1 (1)		
	Others	1 (0) *4		
Pilgrim.	Old Banten	1,192(1)	1,430 *4 (1)	1,430x0.95=1,359 (0) *4
Culture	Others	238(0) *6		1,430x0.05=72 (1) *4
Others	Butukuwung	34 (0) *4		34 *4 (0)
Total		——		1,762 *4 (28)

Source: (*1) Kantor DIPARDA Kab. Pandeglang, Kepala Dinas Pariwisata Daerah Kab. Serang

(*2) JICA Study Team Projection

(*3) JICA Study Team Projection (see Table 2-4)

(*4) 3(1): Nr. of Domestic Visitors (Nr. of Foreign Visitors)

Table I(E)-3 SHARE OF TOURISTS TO THE STUDY REGION IN THOSE TO WEST JAVA IN 1984

Activity	Study region	West Java	Share (%)
Beach	193 20	1,430 144	13.5 13.9
Marine	2 2	336 13	0.6 15.4
Outdoor recreation	98 3	1,262 39	7.8 7.7
Nature observation	5 2	336 13	1.5 15.4
Pilgrimage	1,359 0	2,607 0	52.1 0
Culture	72 1	757 39	9.5 2.6
Others	34 0	1,682 13	2.0 0
Total	1,762 28	8,412 261	20.9 10.7

Remark: Figures in upper columns for domestic visitors, those in lower for foreign ones [refer to Table I(E)-3].

Table I(E)-4 NUMBER OF VISITOR ARRIVALS IN WEST JAVA IN 1984

(1,000 Person-visits)

	Domestic Visitors	Foreign Visitors	Total
Nr. of Visits in West Java	*1 6,471x1.3 = 8,412	*1 *2 1,025x1.3x0.196 = 261	8,673
Beach	*3 8,412x0.17 = 1,430	*4 261x0.55 = 144	1,574
Marine	8,412x0.04 = 336	261x0.05 = 13	349
Nature	8,412x0.04 = 336	261x0.05 = 13	349
Pilgrimage	8,412x0.31 = 2,607	-	2,607
Culture	8,412x0.09 = 757	261x0.15 = 39	796
Outdoor Recreation	8,412x0.15 = 1,262	261x0.15 = 39	1,301
Others	8,412x0.20 = 1,682	261x0.05 = 13	1,695

Remarks: (*1) Average number of visits per trip.
(*2) Share of W. Java in Indonesia.
(*3) Share by activity : Refer to Table I(E)-4
(*4) Share by activity : JICA Study Team Projection

Table I(E)-5 FREQUENCY OF VISITS BY PLACES AND DISTRIBUTION BY ACTIVITY IN WEST JAVA IN 1984

(%)

Places	Frequency	Distribution by Activity							
		Beach	Marine	Nature	Pilgrimage	Culture	Outdoor Rec.	Others	Total
Beach	15.5	90	10						100
Lake	0.8			100					100
Water Reservoir	0.9			30			30	40	100
Cave	0.4			100					100
Tourist Park	6.7		30	20		30	20		100
National Park	1.2			100					100
Sea Garden	0.2		50	50					100
Historical Remains	21.2				60	20		20	100
Museum	0.6					50		50	100
Culture Park	1.0				30	50		20	100
Traditional Ceremony	17.5				90	10			100
Art Performance	0.3					70		30	100
Recreation Park	13.9	20	5				50	25	100
Zoo	2.7							100	100
Camping Ground	2.3						100		100
Others	14.8				14		30	55	100
Total of Tourist Attractions	100.0	17	4	4	31	9	15	20	100

Sources: "Frequency": BPS, Survey on Domestic Tourist, 1984
"Distribution": Same as above and JICA Study Team Projection

Table I(E)-6 METHOD OF ASSIGNING TOURISM DEMANDS BY DESTINATION IN THE STUDY REGION

(1,000 Person-visits)

		Beach	Marine	Nature	Pilgri-mage	Culture	Outdoor Rec.	Others	Total
Tropical Marine Park	E		*1 *2						
	N		682-0						
	T		682						
Kur Park	E						*1 *3	*1 *3	
	N						185x.1	170x.67	
	T						19	114	
Old Banten Site	E			*4 *1 2xR	1,121xR	72xR			
	N			26x.15	113x.1	181x.9			
	T			8	2,280	302			
Existing Beaches in Kab. Serang	E	180xR	3xR				68xR		
	N	668x.17	-				-		
	T	463	6				131		
Others in Kab. Serang	E			1xR			17xR		
	N			-			-		
	T			2			33		
Beach Resort	E	*5							
	N	NSx.75				181x.1	185x.4		
	T	415				18	74		
Ujung Kulon & Krakatau	E			4xR					
	N			26x.9					
	T			30					
Country Park	E								
	N						185x.5	170x.33	
	T						92	56	
Existing Beaches in Pandeglang	E	*5 33xR	1xR				13xR		
	N	NSx.25	-				-		
	T	202	2				25		
Existing Holly Places in Pandeglang	E				238xR				
	N				-				
	T				460				
Others in Pandeglang	E						3xR		
	N						-		
	T						6		
Grand Total	E	*6 412	8	14	2,627	139	195	-	
	N	*7 668	682	26	113	181	185	170	
	T	*8 1,080	690	40	2,740	320	380	170	

E: Tourism demand in existing attractions = Existing demand (Table 3-32)x1.938(P5-43)
N: Tourism demand in newly developed attractions
T: E + N
(*1) Total demand by activity
(*2) There aren't any other tourist destinations to attract newly induced tourism demand as seen in below columns.
(*3) Share of newly induced tourism demand among all by activity.
(*4) R: Growth rate of tourism demand in existing attractions (=1.938 refer to "E")
(*5) NS = 668 - 668 x .17 = 553
(*6) To be calculated by aggregating the respective tourism demand in the concerned destinations.

CHAPTER 2 METHODOLOGY OF STUDY ON CARRYING CAPACITY

Carrying capacity of tourist resources shall be examined to meet the requirements of the following aspects:

- Area,
- Water Supply,
- Labor Market,
- Transportation, and
- Others.

1) Requirements for area

(1) Basic formula

When site is given, its carrying capacity will be figured out as follows:

$$CPI = AR/a$$

$$CPD = CPI \times TR = AR \times TR/a$$

$$CPY = CPD/PR = AR \times TR/(a \times PR)$$

CPI : Instantaneous carrying capacity

CPD : Daily capacity

CPY : Yearly capacity

AR : Size of area

a : Space Standard
(Necessary area per person)

TR : Turnover rate of users per day

PR : (day use) Target ratio of nbr. of daily users to that of yearly ones

(overnight use) $1/(365 \times OR)$

OR : (Bed) occupancy rate

- The above formula shall be applied by group of activities whose requirements for area and patterns of behavior resemble one another.

- When tourism demand is given, the necessary area will be figured out as follows:

$$AR = TD \times a \times PR/TR \quad (TR: \text{ Tourism demand})$$

(2) Basic data

a. Space standard

Resort Hotel

$$a = FS/(ST \times BC)$$

a : Space standard of hotel site

FS : Overall floor space = GS/(2 x RG)

GS : Floor space of guest room (twin beds)

RG : Ratio of floor space of guest room to overall floor space

ST : Number of stories

BC : Building coverage ratio

Space standard of hotel site (a)

(m^2/person)

		Building coverage ratio		
		0.10	0.20	0.30
High class	1	360 - 370	180 - 185	120 - 125
GS = 33 m^2	ST 2	180 - 185	90 - 95	60 - 65
RG = 0.45	3	120 - 125	60 - 65	40 - 45
Medium Class	1	270 - 275	135 - 140	90 - 95
GS = 27 m^2	ST 1	135 - 140	65 - 70	45 - 50
RG = 0.50	3	90 - 95	45 - 50	30 - 35

Note: Although the minimum space standard for twin-bed room is fixed by DGT as 24 m^2/room for 3 star hotel and 26 m^2/room for 5 star hotel, the above figures are proposed taking into consideration the actual situation of existing hotels.

Camp Ground (not auto-camp style)

$a = US/(N \times RU) = 100\text{-}200\ m^2/person$

US : Tent site space per unit (40 m^2)
N : Number of users per unit (4 person)
RU : Ratio of tent site space of overall site space
(in case of resort: 0.05 - 0.10)

Recreation Area (in case of resort)

(m^2/person)

	Facility	Landscape	Total
Beach	15 - 20	15 - 20	30 - 40
Picnic	30 - 40	30 - 40	60 - 80
Sports	100 - 200	100 - 200	200 - 400

b. Turnover ratio

Turnover ratio varies with climate, location and activities, but its standard figures are as follows:

Accommodation : 1.0
Beach : 1.0 - 1.5
Picnic ground : 1.2 - 1.8
Sports ground : 2.0 - 2.5

(3) Requirements for other aspects

a. Water requirements

Hotel : 500 (medium class) - 750 (high) lit/bed
It is desirable to consider higher standard in case of

beach resort because of extra demand for shower after sea bathing.

Camp ground : 100 - 200 lit/bed

Day use recreation area

(picnic area) : 30 - 50 lit/person

(beach area) : 50 - 100 lit/person

b. Labor requirements

Hotel : 1.60 persons/room

Camp ground : 0.05 - 0.10 person/bed

Tourist object : 2 - 10 persons/ha

Cruising boat : 0.2 - 0.3 persons/pax

c. Transportation requirements

The traffic capacity of roads can be calculated as follows:

$$SF_i = 2,800 \times (v./c)_i \times f_d \times f_w \times f_{HV}$$

SF_i = Total service flow rate in both directions for prevailing roadway and traffic conditions, for level of service i, in vph.

$(v./c)_i$ = ratio of flow rate to ideal capacity for level of service i

f_d = adjustment factor for directional distribution of traffic

f_w = adjustment factor for narrow lanes and restricted shoulder width

f_{HV} = adjustment factor for the presence of heavy vehicles in the traffic stream, computed as:

$f_{HV} = 1/[1+P_T(E_T-1) + P_R(E_R-1) + P_B(E_B-1)]$

P_R = proportion of RV's in the traffic stream

P_T = proportion of trucks in the traffic stream

P_B = proportion of buses in the traffic stream

E_T = passenger-car equivalent for trucks

E_R = passenger-car equivalent for RV's

E_B = passenger-car equivalent for buses

The approximate traffic capacity of two (2) lane provincial roads in the study region, in general, is estimated at 1,000 to 1,500 vehicles/hour/both directions.

Therefore, the instantaneous carrying capacity of tourist resources shall be determined to meet the above-mentioned traffic capacity as follows.

CPI = NRV x anp x lva

NRV : Capacity of recreation vehicles
(SF x Portion of recreation traffic = SF x (0.5 - 0.9))

anp : Average nbr. of passengers per vehicle

lva : Effective hours for visitor arrival

Assuming that the proportion of trucks and buses will be 0.05 and 0.3 - 0.5 respectively, the maximal number of visitor arrivals per hour can be calculated as shown in the following Table.

Maximal number of visitor arrivals per hour
by two lanes provincial road.

(1,000 persons)

	Proportion of recreation vehicles				
	0.5	0.6	0.7	0.8	0.9
0.1	3.9 - 5.0	4.7 - 7.1	5.5 - 8.3	6.3 - 9.4	7.1 - 10.6
POB 0.2	6.1 - 9.2	7.3 - 11.0	8.6 - 12.8	9.8 - 14.7	11.0 - 16.5
0.3	8.3 - 12.5	10.0 - 14.9	11.6 - 17.4	13.3 - 19.9	14.9 - 22.4

POB: Proportion of buses in traffic stream

2) Case study on Pantai Carita

Although carrying capacity shall be examined from all kinds of aspects mentioned before, the followings are made to meet only space requirement because of the lack of data.

- Size of site

$3,000 \times 150 \times 2/3 = 300,000\ m^2$

2/3: Coefficient of effective land

- Basic data to be applied

(Accommodation)

GS = 27 m^2, RG = 0.50, ST = 1.2, BC = 0.15

$a = 27/(2 \times 0.5 \times 1.2 \times 0.15) = 150\ m^2$/person

(Day use facilities)

$a = 60\ m^2$/person

- Assumption

NA:ND = 40:60 (35:65 in present time)

NA: Number of yearly overnight user visitors
ND: Number of yearly day use visitors

- Formulation

$$CPIA = NA \times ls/(365 \times OR)$$
$$CPID = ND \times PR \times 1/TR$$

CPIA : Instantaneous carrying capacity of overnight-use
CPID : Instantaneous carrying capacity of day-use
ls : Average length of stay (1.3 nights)
PR : Target ratio of number of daily day-use visitors to that of yearly ones (0.02)
TR : Turnover rate of day-use visitors per day (1.2)
OR : Target average bed occupancy rate (0.3)

$150 \times CPIA + 60 \times CPID = 300,000\ m^2$

- Results

CPIA = 1,100 beds, CPID = 2,300 persons
Total = 3,200 persons
NA = 91,000 persons, ND = 137,000 persons
Total 228,000 persons

Note

- The above figures shall be reviewed if the space is not available.

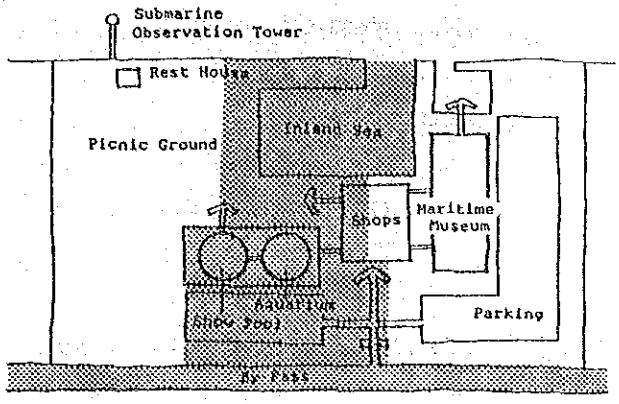
CHAPTER 3 STAGE PLAN AND RATING CRITERIA

FIG. I(E)-1 DEVELOPMENT UNITS BY PROJECT

1) TROPICAL MARINE PARK

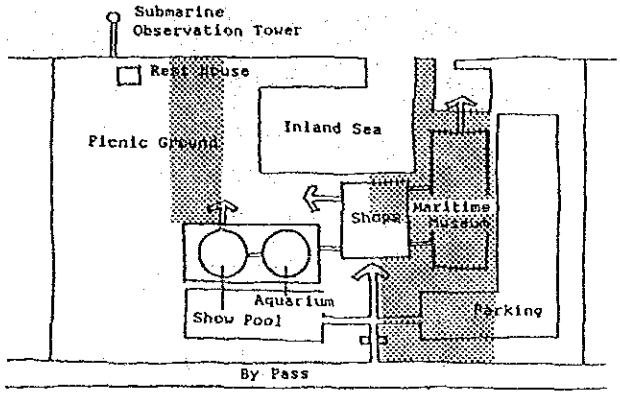
(Unit 1)

Capacity
day-use: 3,000



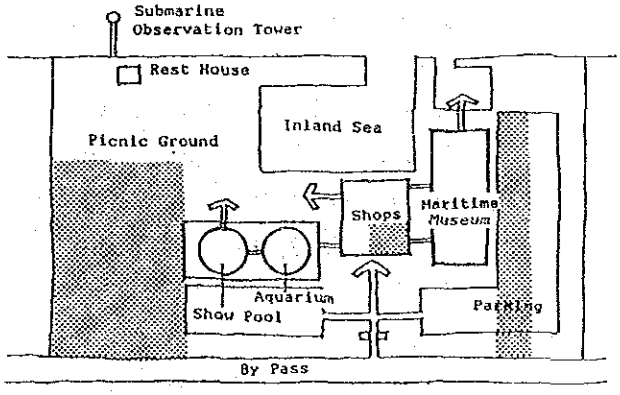
(Unit 2)

Capacity
day-use: 1,500



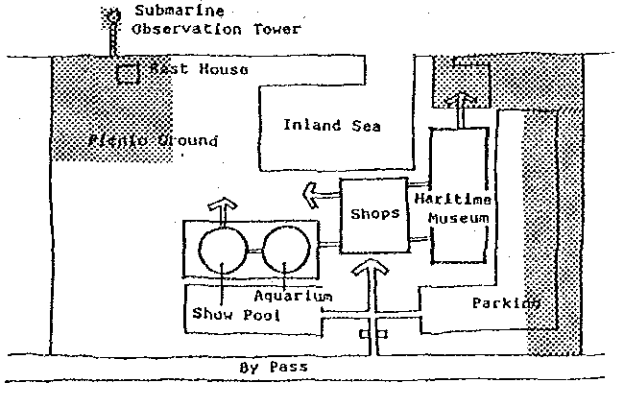
(Unit 3)

Capacity
day-use: 1,500



(Unit 4)

Capacity
day-use: 3,000



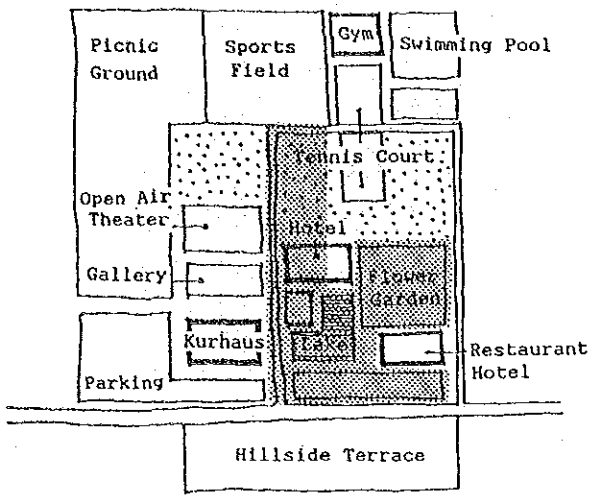
2) KUR PARK

(Unit 1)

Capacity

day-use : 500

over-night : 100

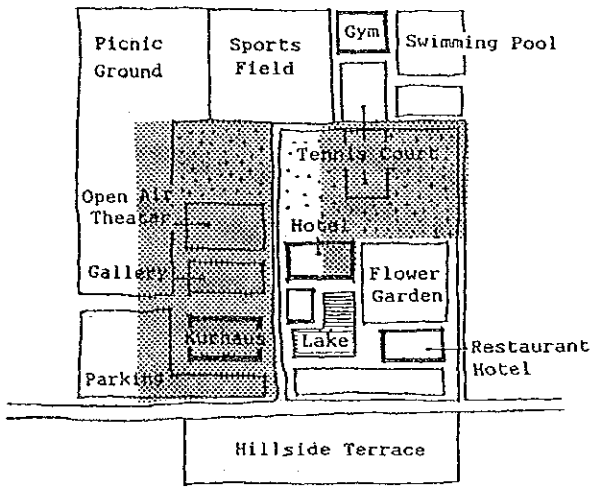


(Unit 2)

Capacity

day-use : 500

over-night : 100

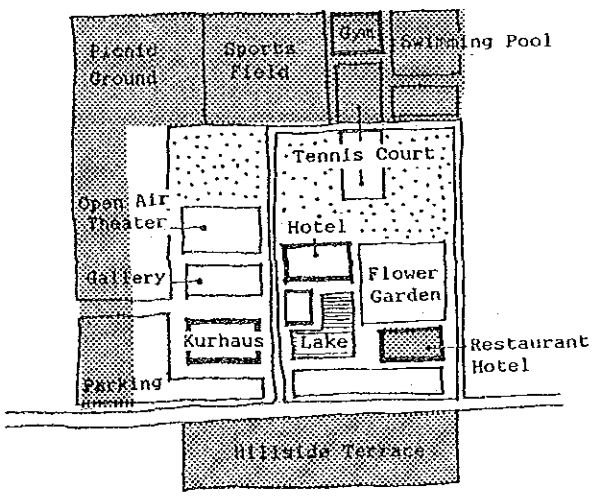


(Unit 3)

Capacity

day-use : 1,000

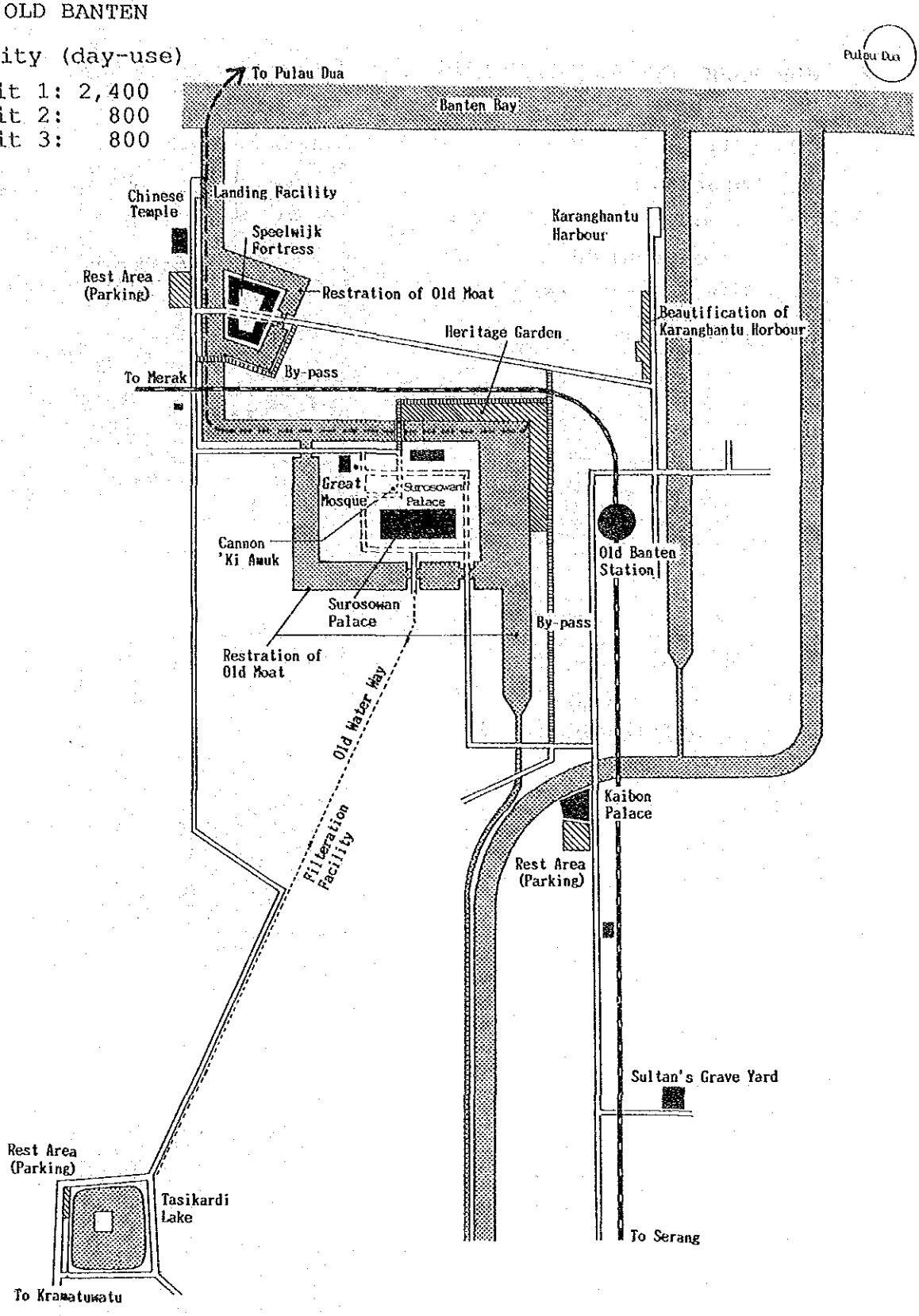
over-night : 200



3) OLD BANTEN

Capacity (day-use)

Unit 1: 2,400
Unit 2: 800
Unit 3: 800



LEGEND

- Planned Facilities
- Existing Assets
- Planned By-pass

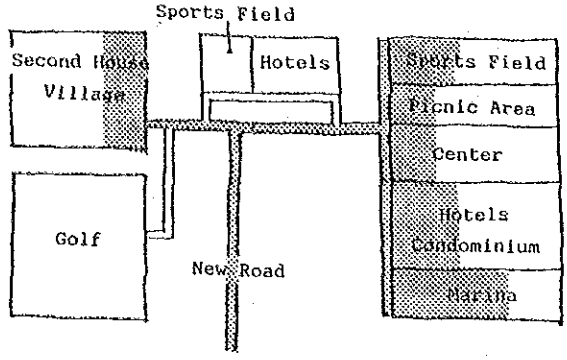
4) BEACH RESORT

(Unit 1)

Capacity

day-use : 2,000

over-night : 760

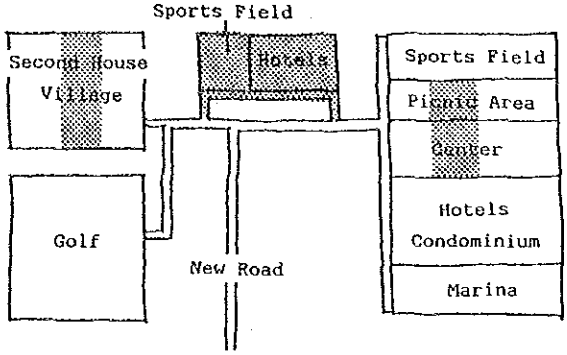


(Unit 2)

Capacity

day-use : 2,000

over-night : 460

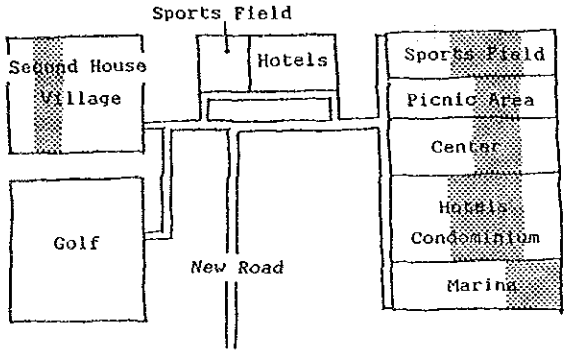


(Unit 3)

Capacity

day-use : 2,000

over-night : 380

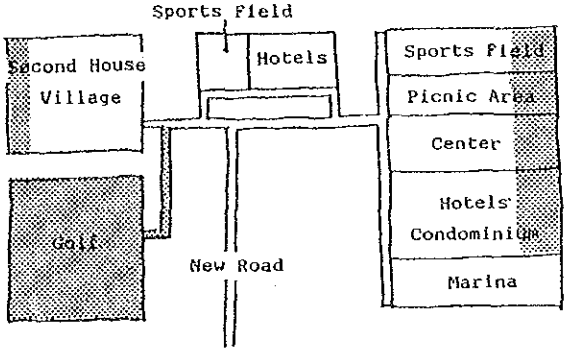


(Unit 4)

Capacity

day-use : 1,500

over-night : 1,000



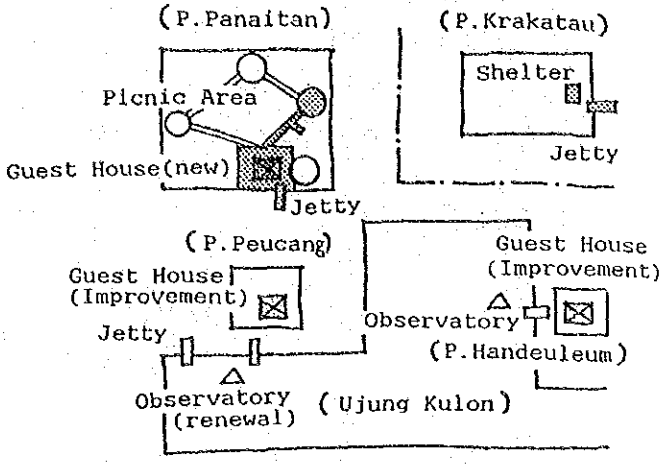
5) UJUNG KULON & KRAKATAU

(Unit 1)

Capacity

day-use : 200

over-night : 75

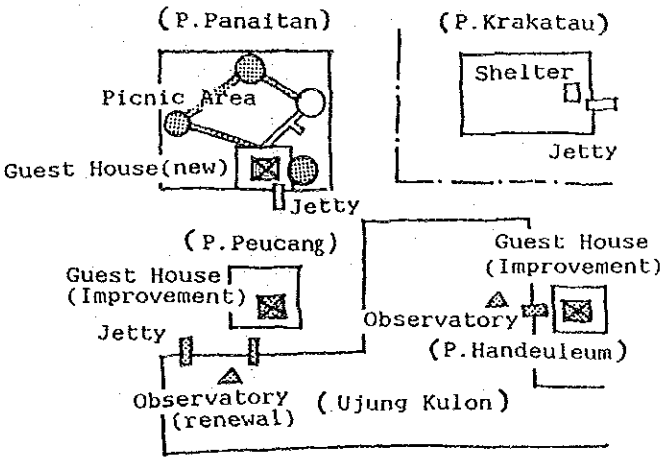


(Unit 2)

Capacity

day-use : 200

over-night : 25

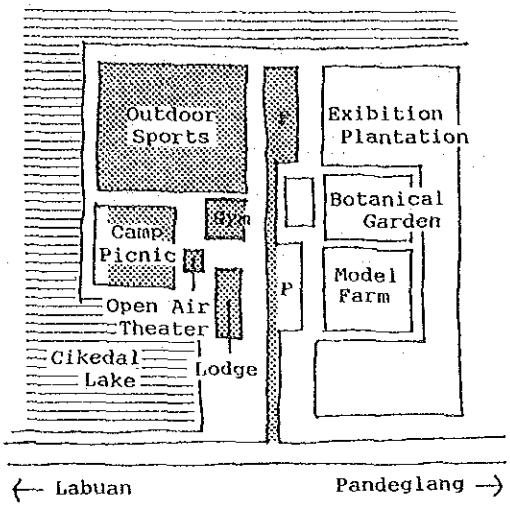


6) COUNTRY PARK

(Unit 1)

Capacity

day-use	:	1,200
overnight-use	:	400



(Unit 2)

Capacity

day-use	:	800
overnight-use	:	200

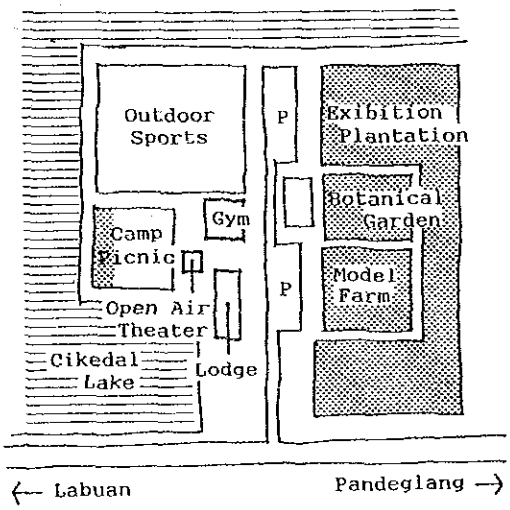


TABLE I(E)-7 CRITERIA FOR RATING OF IMPACT ON NATURAL ENVIRONMENT

	Nbr. of units to be developed in one stage					
	≥3			2		
(Stage)	1st	2nd	3rd	1st	2nd	3rd
Large scale projects	-10	-8	-	-6	-4	-2
Projects in sensitive environment/1	-	-	-	-3	-2	-
Other projects/2	-/3	-	-	-2	-1	-0.5

Remarks:
/1 Ujung Kulon
/2 Kur Park, country Park
/3 Although the number of development units of Kur Park is three, the units 1 and 2 are counted as one unit because of their scale.

TABLE I(E)-8 CRITERIA FOR RATING THE SOCIO-CULTURAL IMPACT

(Beach Resort) Nbr.of Units to be developed in one stage	(Tropical Marine Park) Nbr. of units to be developed in one stage			
	3 ≥	2	1	0
3 ≥	-6	-5	-4	-3
2	-5	-3.5	-4	-1.5
1	-4	-2	-1	-0.5
0	-3	-1.5	-0.5	0

Remarks:

If Kur Park and/or Country Park are developed in Stage 1 together with the above projects, -2 points will be added

In case of development in Stage 2, criteria would be half of the above ones.

TABLE I(E)-9 ANALYSIS RESULTS OF INPUT-OUTPUT TABLE

(1) Concerned items

Development investment	- Construction
Hotel & restaurant expenses	- Restaurant and hotel
Expenses for facilities	- Other services
Shopping expenses	- Trade
Transportation expenses	- Road transport and water treatment

(2) Multipliers

Construction	1.710782
Restaurant & hotel	1.813473
Other services	1.456926
Trade	1.126341
Transportation	1.400044

TABLE I(E)-10 RATING CRITERIA FOR LAND ACQUISITION

	Nbr. of Stages for Development		
	3	2	1
Tropical Marine Park	-5	-3	0
Kur Park	-3	-2	0
Old Banten Site	-2	-1	0
Beach Resort	-6	-3	-
Ujung Kulon & Krakatau	-	-	-
Country Park	-	-2	0

TABLE I(E)-11 RATING CRITERIA FOR CAPACITY OF INFRASTRUCTURE

	Nbr. of units to be developed				
	1st stage		2nd stage		3rd stage
	3≥	2	3	2	2
Tropical Marine Park	-10	-6	-6	-3	-2
Kur Park	-	-3	-	-2	-
Old Banten Site	-6	-4	-	-1	-
Beach Resort	-10	-6	-6	-3	-2
Ujung Kulon & Krakatau	-	-2	-	-	-
Country Park	-	-2	-	-	-

TABLE I(E)-12 CUMULATIVE CAPACITY BY STAGE

(Persons)

Alternative		Stage 1 Day-use	Stage 1 Overnight	Stage 2 Day-use	Stage 2 Overnight	Stage 3 Day-use	Stage 3 Overnight
1	Serang	2,400	0	6,000	400	15,000	400
	Pandeglang	2,000	760	7,500	2,600	9,900	3,300
	Total	4,400	760	13,500	3,000	24,900	3,700
2	Serang	4,000	0	6,000	400	15,000	400
	Pandeglang	2,000	760	7,500	2,600	9,900	3,300
	Total	6,000	760	13,500	3,000	24,900	3,700
3	Serang	4,000	0	6,000	400	15,000	400
	Pandeglang	4,000	1,220	7,500	2,600	9,900	3,300
	Total	8,000	1,220	13,500	3,000	24,900	3,700
4	Serang	5,900	100	10,200	200	15,000	400
	Pandeglang	2,000	760	5,400	1,695	9,900	3,300
	Total	7,900	860	15,600	1,895	24,900	3,700
5	Serang	5,900	100	11,000	200	15,000	400
	Pandeglang	2,200	835	5,600	1,720	9,900	3,300
	Total	8,100	935	16,600	1,920	24,900	3,700
6	Serang	7,500	100	11,000	200	15,000	400
	Pandeglang	2,400	860	7,600	2,100	9,900	3,300
	Total	9,900	960	18,600	2,300	24,900	3,700
7	Serang	7,500	100	14,000	200	15,000	400
	Pandeglang	2,400	860	7,600	2,100	9,900	3,300
	Total	9,900	960	21,600	2,300	24,900	3,700
8	Serang	7,500	100	15,000	400	15,000	400
	Pandeglang	2,400	860	7,600	2,100	9,900	3,300
	Total	9,900	960	22,600	2,500	24,900	3,700
9	Serang	2,900	100	5,000	200	15,000	400
	Pandeglang	2,000	760	5,400	1,695	9,900	3,300
	Total	4,900	860	10,400	1,895	24,900	3,700
10	Serang	2,900	100	8,000	200	15,000	400
	Pandeglang	2,000	760	5,400	1,695	9,900	3,300
	Total	4,900	860	13,400	1,895	24,900	3,700
11	Serang	2,900	100	5,000	200	15,000	400
	Pandeglang	2,200	835	5,600	1,720	9,900	3,300
	Total	5,100	935	10,600	1,920	24,900	3,700
12	Serang	4,500	100	8,000	200	15,000	400
	Pandeglang	2,400	860	5,600	1,720	9,900	3,300
	Total	6,900	960	13,600	1,920	24,900	3,700
13	Serang	2,900	100	8,000	200	15,000	400
	Pandeglang	3,400	1,235	7,600	2,100	9,900	3,300
	Total	6,300	1,335	15,600	2,300	24,900	3,700
14	Serang	2,900	100	11,000	200	15,000	400
	Pandeglang	3,400	1,235	7,600	2,100	9,900	3,300
	Total	6,300	1,335	18,600	2,300	24,900	3,700
15	Serang	2,900	100	12,000	400	15,000	400
	Pandeglang	3,400	1,235	7,600	2,100	9,900	3,300
	Total	6,300	1,335	19,600	2,500	24,900	3,700
16	Serang	2,900	100	12,000	400	15,000	400
	Pandeglang	3,400	1,235	8,400	2,300	9,900	3,300
	Total	6,300	,224	20,400	2,700	24,900	3,700

TABLE I(E)-13 TOURIST FACILITIES BY PROJECT AND DEVELOPMENT UNIT

PROJECT	FACILITY	UNIT 1	UNIT 2	UNIT 3	UNIT 4	TOTAL
Tropical Marine Park "A" & "C"	Aquarium, Show Pool (m^2)	10,000				10,000
	Maritime museum (m^2)		6,000		4,000	10,000
	Model ship harbor (m^2)				7,000	7,000
	Center, Office, Shops (m^2)	4,350	2,150	2,000		8,500
	Submarine observation tower(m^2)				2,000	2,000
	Picnic Field (m^2)	14,000	28,000	42,000	56,000	140,000
	Ropeway (Nbr.)				1	1/1
	Parking (m^2)	9,000	6,000	6,000	9,000	30,000
Kur Park	Hotel (bds)	100	100	200		400
	Kurhouse, Gallery (m^2)		7,000			7,000
	Gymnasium (m^2)			3,500		3,500
	Open air theater (m^2)		1,200			1,200
	Outdoor sports (m^2)		11,000	14,000		25,000
	Flower garden, Rockery (m^2)	10,000		5,000		15,000
	Picnic field, others (m^2)	11,000	5,400	3,600		20,000
	Parking (m^2)	4,000	4,000	6,000		14,000
Old Banten Site	[Heritage Garden]					
	Performance art theater (m^2)	1,000				1,000
	Folk art museum, Exhibition (m^2)	1,000				1,000
	Restaurant, shop, etc. (m^2)	580				580

Remark: /1 in case of Site "C"

PROJECT	FACILITY	UNIT 1	UNIT 2	UNIT 3	UNIT 4	TOTAL
	Parking (m^2)	10,000				10,000
	[Moat]					
	Restoration of moat (km)	4.5				4.5
	Landing facility (Nbr.)	2				2
	[Existing Facility Area]					
	Cafeteria shop (m^2)	2,160	2,160			4,320
	Open space (m^2)	30,000	15,000			45,000
	Parking (m^2)	25,000	25,000			50,000
	[Pepper Trade Museum]					
Old Banten Site	Museum (m^2)		400			400
	Plaza (m^2)		1,000			1,000
	Parking (m^2)		1,000			1,000
	[Tasikardi]					
	Rest space with kiosk (m^2)		10,000			10,000
	Parking (m^2)		1,000			1,000
	[Market Place]					
	Market place (rehabilitation) (m^2)			7,000		
	Beautification of harbor (m^2)			10,000		
	[Approach road] (km)	6	5.5	3.5		15

PROJECT	FACILITY	UNIT 1	UNIT 2	UNIT 3	UNIT 4	TOTAL
Beach Resort ("C")	Hotel Condominium (bds)	600	300	300	400	1,600
	Second House Village (lots)	40	40	20	25	125
	Center Building (m^2)	13,500	9,000	13,500	9,000	45,000
	Marina (boats)	180		120		300
	Golf Course (holes)				18	18
	Other Sports Facilities (m^2)	23,000	23,000	15,000	15,000	76,000
	Picnic Field (m^2)	24,000	24,000	16,000	16,000	80,000
	Parking (m^2)	8,000	5,000	5,000	8,000	26,000
	Employee's Dormitory (bds)	360	180	180	180	900
Beach Resort ("D")	Hotel Condominium (bds)	700	300	400	500	1,900
	Second House Village (lots)	45	45	25	30	145
	Center Building (m^2)	15,000	10,000	15,000	10,000	50,000
	Marina (boats)	180		120		300
	Golf Course (holes)				18	18
	Other Sports Facilities (m^2)	27,000	27,000	17,500	17,500	89,000
	Picnic Field (m^2)	30,000	30,000	20,000	20,000	100,000
	Parking (m^2)	9,600	6,400	6,400	9,600	32,000
	Employee's Dormitory (bds)	120	60	60	60	300

PROJECT	FACILITY	UNIT 1	UNIT 2	UNIT 3	UNIT 4	TOTAL
Ujung Kulon & Krakatau Is.	Guest House [new] (pers.)	75	25			100
	Guest House [improved] (pers.)		some			some
	Outdoor Field (m^2)	8,000	some			8,000
	Observatory (Nbr.)	2	2			4
	Jetty (Nbr.)	2	3			5
	Shelter (Krakatau Is.] (bldg.)	1				1
	Cruising Base [Labuan] (Nbr.)	1				1
Country Park	Center Lodge, Shop (bds)	200				200
	Office (m^2)	3,000				3,000
	Indoor Sports Facility (m2)	1,500				1,500
	Outdoor Theater (m^2)	500				500
	Restaurant, Shop, Office (m^2)		400			400
	Glass House, Factory (m^2)		500			500
	Other Buildings (m^2)	180	40			220
	Camp Ground (pers.)	200	200			400
	Outdoor Sports Facility (m^2)	40,000				40,000
	Exhibition Plantation, Model Farm (m^2)		35,000			35,000
	Botanical Garden (m2)		3,000			3,000
	Picnic Field (m^2)		5,000			5,000
	Parking (m^2)	12,000	5,000			17,000

Table I(E)-14 DEVELOPMENT COST

(Current Prices as of Oct. 1986, Rp. x 10^9)

	Unit 1			Unit 2			Unit 3			Unit 4			Total		
	CC	LC	TC	CC	LC	TC	CC	LC	TC	CC	LC	TC	CC	LC	TC
Tropical Marine Park	6.8	3.0	9.8	2.3	0.5	2.8	1.5	0.5	2.0	3.8	1.0	4.8	14.4	5.0	19.4
Kur Park	3.4	0.8	4.2	4.6	0.6	5.2	3.5	0.6	4.1				11.5	2.0	13.5
Old Banten Site	10.5	0.7	11.2	3.8	-	3.8	1.9	0.1	2.0				16.2	0.8	17.0
Beach Resort	22.5	0.2	22.7	8.6	-	8.6	16.4	-	16.4	15.1	-	15.1	62.6	0.2	62.8
Ujung Kulon & Krakatau Is.	3.0	0.1	3.1	1.2	-	1.2							4.2	0.1	4.3
Country Park	5.0	0.4	5.4	1.8	0.2	2.0							6.8	0.6	7.4

Remarks: CC : Construction cost (including engineering fees and adminsitration expenses and physical contingency).
LC : Land acquisition cost (excluding compensation).
TC : Total cost

Table I(E)-15 AVERAGE TOURIST EXPENDITURE PER PERSON

(RP. 1,000, Current Price as of 1986)

		Accommo-dation	Food, Drink & shopping	Facility Charge	Transpor-tation	Total
Tropical Marine Park	D	-	3.0-5.0	3.0-4.0	0.1-0.2	6.1-9.2
	N	-	-	-	-	-
Kur Park	D	-	4.0-7.0	5.0-10.0	-	9.0-17.0
	N	30.0-40.0	18.0-23.0	12.0-16.0	-	60.0-79.0
Old Banten Site	D	-	2.1-3.3	0.3-0.5	0.02-0.03	2.42-3.83
	N	-	-	-	-	-
Beach Resort	D	-	8.0-14.0	5.0-15.0	0.2-0.5	13.2-29.5
	N	38.0-57.0	22.0-29.0	10.0-20.0	0.8-1.5	70.8-107.5
Ujung Kulon & Krakatau	D	-	5.0-9.0	1.0-2.0	70.0-100.0	76.0-111.0
	N	20.0-30.0	16.0-26.0	2.0-3.0	72.0-104.0	110.0-163.0
Country Park	D	-	2.3-3.6	2.0-3.0	-	4.3-6.6
	N	1.0-9.0	5.0-10.0	3.0-5.0	-	9.0-24.0
Other Existing Destination	D	-	2.3-3.9	1.0-2.0	-	3.3-5.9
	N	5.0-20.0	13.0-20.0	2.0-3.0	-	20.0-43.0

Remarks: D = Day-use N = Overnight-use

Table I(E)-16 NUMBER OF EMPLOYEES IN 2010 BY PROJECT AND CATEGORY

(Persons)

	Senior	Profes-sional	General	Others	Total
Serang					
Tropical Marine Park	12	36	48	144	240
Kur Park	11	39	138	158	346
Old Banten Site	10	33	132	155	330
Other Existing Destination	36	95	179	286	596
Sub Total	69	203	497	743	1,512
Pandeglang					
Beach Resort	87 (101)	281 (323)	884 (1,023)	1,251 (1,445)	2,503 (2,892)
Ujung Kulon & Krakatau	7	14	21	25	67
Country Park	6	15	27	42	90
Other Existing Destination	27 (27)	77 (76)	152 (149)	250 (245)	506 (497)
Sub Total	127 (14)	387 (428)	1,084 (1,220)	1,568 (1,751)	3,166 (3,546)
Grand Total	196 (210)	590 (631)	1,581 (1,717)	2,311 (2,500)	4,678 (5,058)

Remark: The figures in parentheses show the number of employees in case of site "D" of Beach Resort.

Table I(E)-17 BASIC DATA FOR OPERATION COST/1

(Rp.x10^3, if not specified: Current Prices as of 1986)

	Labor /2	Material /2	Utility & Fuel	Administration	Repair	Sales Promotion
	Unit price per man-month	Ratio to turnover	Ratio to turnover	Unit price per employee	Ratio to construction cost	Ratio to turnover
Tropical Marine Park	40 - 250	0.05 - 0.55	0.05	500	0.005	0.07
Kur Park	35 - 200	0.05 - 0.55	0.05	400	0.005	0.05
Old Banten Site	30 - 150	0.05 - 0.60	0.04	300	0.003	0.02
Beach Resort	45 - 300	0.05 - 0.50	0.05	500	0.005	0.07
Ujung Kulon & Krakatau Is.	30 - 150	0.05 - 0.55	0.10	500	0.004	0.05
Counry Park	30 - 150	0.05 - 0.60	0.03	300	0.004	0.02
Other Existing Destinaitons	30 - 150	0.05 - 0.60	0.03	350	0.004	0.05

Remarks: /1 Tax and depreciation are to depend on the regulation concerned.

/2 Detail to be referred to in Annex II.

Table I(E)-18 PRIMARY RESULT OF OVERALL RATING

	FE	JB	NE	SC	ME	RB	LA	DC	FF	PI
1	1873	2,417	-25	-2.5	45,010	34,297	-5	17,786	7.81	-28
2	1876	2,163	-25	-2.5	45,176	34,412	-3	13,312	7.90	-33
3	1918	2,229	-27	-2.8	46,072	34,903	-3	13,100	8.05	-32
4	1796	2,016	-6	-4.0	45,173	34,811	-18	13,963	6.31	-5
5	1806	2,039	-6	-4.0	45,503	35,093	-18	13,564	6.42	-6
6	1887	2,162	-11	-4.8	47,039	35,955	-18	14,559	6.75	-12
7	1892	2,186	-15	-5.5	47,357	36,222	-14	16,937	6.91	-17
8	1909	2,231	-16.5	-5.5	47,893	36,555	-13	18,392	7.11	-18
9	1766	1,970	-12	-2.8	43,588	33,666	-12	10,842	6.61	-13
10	1782	1,994	-10	-3.0	44,364	34,244	-15	12,616	6.46	-10
11	1776	1,983	-12	-2.8	43,895	33,900	-12	10,351	6.71	-13
12	1794	2,019	-13	-3.0	44,780	34,567	-14	13,167	6.79	-14
13	1874	2,123	-12	-4.0	46,261	35,439	-15	12,248	6.64	-13
14	1880	2,144	-14	-5.5	46,632	35,701	-15	10,483	6.80	-14
15	1897	2,188	-15.5	-5.5	47,155	36,026	-14	12,318	7.00	-14
16	1900	2,203	-15.5	-6.0	47,308	36,146	-14	11,935	7.00	-15

Remarks: FE = Acquisition of Foreign Exchange (Rp. 10^6 per annum)
JB = Job Opportunity (Person annum)
NE = Impact on Natural Environment (Score)
SC = Socio-cultural Impact (Score)
ME = Multiplier Effects (Rp. 10^6 per annum)
RB = Recreation Benefit (Rp. 10^6 per annum)
LA = Land Acquisition (Score)
DC = Development Cost (Rp. 10^6 per annum)
FF = Financial Feasibility (%)
PI = Capacity of Infrastructure (Score)

ANNEX I (F)

ENVIRONMENT ASPECT

ANNEX I(F)

ENVIRONMENT

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CHAPTER 1 ENVIRONMENTAL CONDITIONS

1.1 National Parks and Nature Reserves

The Republic of Indonesia is famous for its rich nature and peculiar fauna and flora such as Orangutans of Sumatra, Kalimantan's Proboscis monkey and so on. Based on the attractive natural resources, 16 national parks and 164 nature reserves are designated by PHPA (Perlindungan Hutan dan Pelestarian Alam) throughout the country [See Table I(F)-1]. Fig. I(F)-1 shows the distribution of the national parks and the nature reserves in the study region.

Ujung Kulon national park, one of the nearest parks to DKI. Jakarta, is distributed in the southern part of the study region. Ujung Kulon national park is a vast primeval park with a total area of 78,619 ha including Krakatau Volcanoes, Panaitan Island, etc. as shown in Table I(F)-2. In the park, there exist virgin lowland rain forests where the one horn Javan rhinoceros survive. Other wild animals such as Bantens (Javan wild ox), others, fruit bats, leaf monkeys, macaques, wild pigs, crocodiles, hornbills, peatowls, etc. can be observed everywhere in the park. These wild animals contain the endemic species in Java. The list of fauna which were confirmed the existence in Ujung Kulon are shown in Table I(F)-3.

Table I(F)-4 shows the area and location of the nature reserves and the recreation parks in the study region.

Pulau Dua is the bird sanctuary which is designated as the nature reserve with the two islands as shown in Fig. I(F)-2. The islands located within 20 minutes from Banten port (Karaghantu) by boat are just places for the nesting and roosting for many seabirds and migratory birds.

Table I(F)-1 NUMBER OF NATIONAL PARKS, NATURE RESERVES, ETC. IN INDONESIA

Item	Number of Places
1. National Park	16/1
2. Nature Reserve	164
3. Wildlife Reserve	51
4. Recreation Forest (Taman Wisata) - recreation park - game reserve/hunting forest	60
5. Sea Garden	5
Total	296

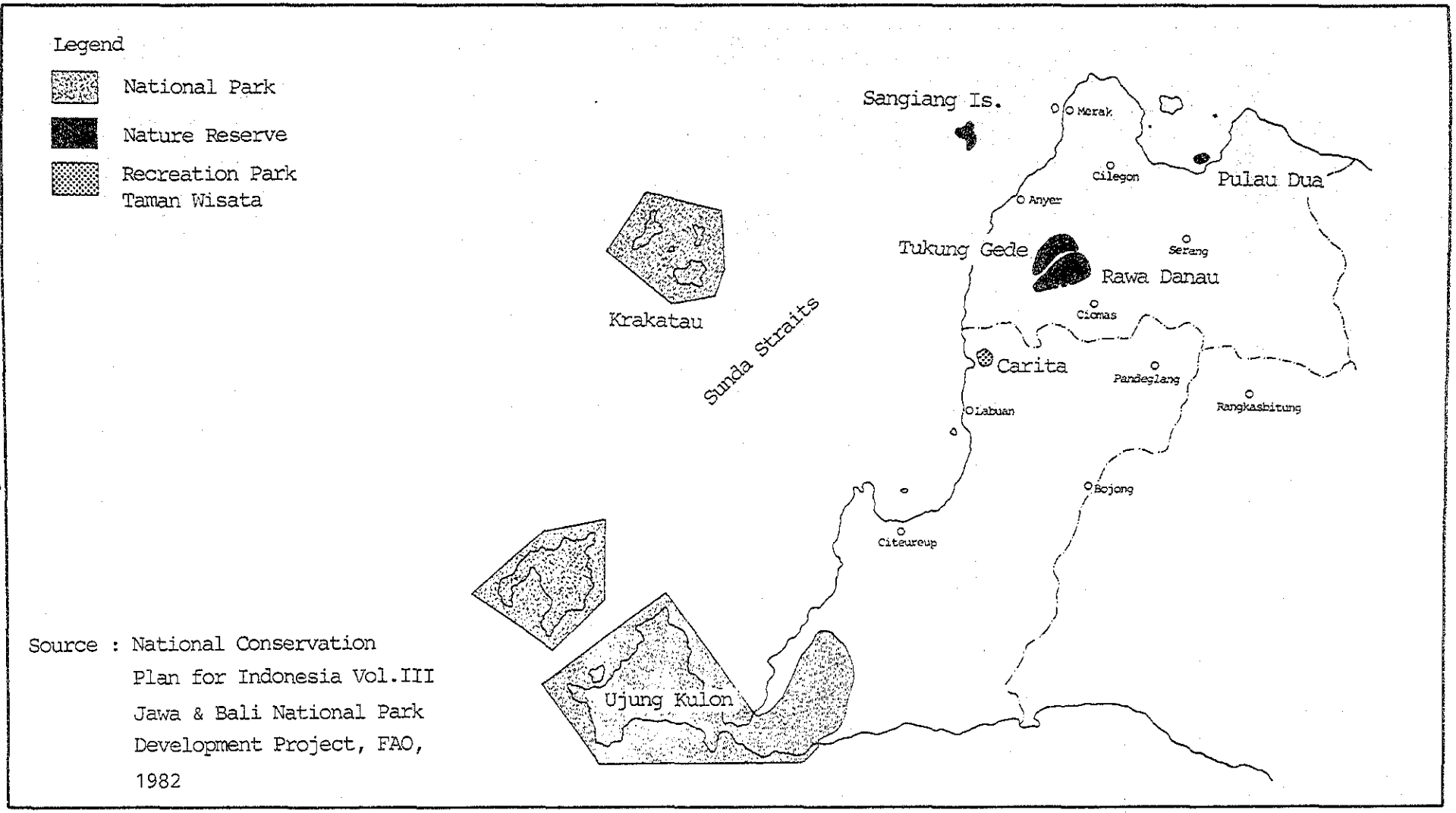
Remark: /1 23 National Parks are proposed in addition to the existing 16 parks.

Source: Departmen Hutan, Direktorat Jenderal Perlindungan Hutan dan Pelestarian Alam

Table I(F)-2 OUTLINE OF UJUNG KULON NATIONAL PARK

	Name	Area (ha)	Location	Year of Stipulation
1.	Panaitan & Peucang	17,500	Kab. Pandeglang	1937
2.	Ujung Kulon	39,120	Kab. Pandeglang	1958
3.	G. Honje	10,000	Kab. Pandeglang	1967
4.	Perluasan G. Honje	9,399	Kab. Pandeglang	1979
5.	G. Krakatau	2,500	Lampung Selatan	1919
	Total	78,619		

Source: Statistik Kehutanan, Balai Konservasi Sumberdaya Alam III, Bogor, 1986, Direktorat Jenderal Perlindungan Hutan dan Pelestarian Alam



Source : National Conservation Plan for Indonesia Vol.III Jawa & Bali National Park Development Project, FAO, 1982

DEPARTMENT OF TOURISM, POST AND TELECOMMUNICATION
DIRECTORATE GENERAL OF TOURISM
JAPAN INTERNATIONAL COOPERATION AGENCY
THE STUDY ON THE REGIONAL DEVELOPMENT PROJECT IN THE WESTERN PART OF JAVA

Fig. I(I)-1
DISTRIBUTION OF NATURE CONSERVATION AREAS

F.3

Table I(F)-3 LIST OF FAUNA IN UJUNG KULON

1) Preliminary Checklist of the Mammals of Ujung Kulon

Based on records of : A. P. M. Van der Zon
A. Hoogerwert

UK : Ujung Kulon
HO : Gunung Honge
PE : Pulau Peucang
PA : Pulau Panaitan

Scientific name	English	Indonesian	Family	Recorded from
Rhinoceros sondaicust	Javan rhinoceros	Badak Java	Rhinocerotidae	UK, HO
Bos javanicus	Banteng	Banteng	Bovidae	UK, HO
Cervus timorensis	Rusa	Rusa	Cervidae	UK, HO, PE
Fluntiacus muntjak	Barking deer	Muncak	Cervidae	UK, HO, PE
Tragulus javanicus	Chevrotain	Kancil	Tragulidae	UK, HO, PA, PE
Sus scrofa	Wild pig	Babi alang-2	Suidae	UK, HO, PE, PA
Sus verrucosus	Wild pig	Babi alas	Suidae	UK, HO
Cynocephalus variegatus	Flying lemur	Walang kopo	Cynoccphalidae	UK
Pteropus vampyrus	Flying fox	Kalong	Pteropodidae	UK, HO, PE
Hipposideros larvatus	Javan leaf-nosed bat	Kampret	Rhinolophidae	PE
Macaca irus	Crab-eatine macaque	Kera	Cercopithecidae	UK, HO, PE, PA
Presbytis cristata	Silv ed leaf-monkey	Lutung	Cercopithecidae	UK, HO
Presbytis aygula	Javan leaf-monkey	Surili	Cercopithecidae	UK, HO
Hylobates moloch	Javan gibbon	Ungko wau-wau	Hylobatidae	UK, HO
Hycticebus coucang	Slow loris	Kukang	Loricidae	HO
Tupaia glis	Common trees shrew	Tupai tanah	Tupaiidae	UK
Tupaia javanica	Small tree shrew	Tupai kekes	Tupaiidae	UK
Manis javanica	Scaly ant eater	Trenggiling	Manidae	UK (?)
Hystrix javanica	Javan poroupine	Landak	Hystricidae	UK
Ratufa bicolor	Black giant squirrel	Jelarang	Sciuridae	UK, PE, PA
Callosciurus notatus	Common coconut squirrel	Bajing	Sciuridae	UK, PE, PA
Rattus rattus	House rat	Tikus	Muridae	UK, PE
Rattys surifer	Collared field rat	Tikus	Muridae	UK
Cuon alpinus	Red dog	Ajak	Canidae	UK, HO
Felis viverrina	Fishing cat	Kucing bakau	Falidae	UK
Felis bengalensis	Leopard cat	Kucing batu	Felidae	UK
Panthera pardus	Leopard	Macan tutul	Felidae	UK, HO, PE
Viverricula malaccensis	Javan civet	Rasse	Viverridae	UK
Paradoxurus hermaphrodites	Palm civet	Luwak	Viverridae	UK
Arctogalidia trivirgata	Yellow palm civet	Luwak pohon	Viverridae	UK
Arctictis binturong	Bearcat	Binturong	Viverridae	UK
Herpestes javanicus	Javan mongoose	Ganggarangan	Viverridae	UK
Lutrogale perspicillata	Clawless otter	Sero	Mustelidae	UK
Lutra sumatrana	Sea otter	Barang-barang	Mustelidae	UK
Delphinidae	Dolphine	Lumba-lumba		UK

Sources: Ujung Kulon National Park Management Plan 1977-1981,
Nature Conservation & Wildlife Management Project, UNDP/FAO 1977

2) List of Reptiles and Amphibia

UK : Ujung Kulon
HO : Gunung Honge
PE : Pulau Peucang
PA : Pulau Panaitan

Scientific name	Indonesian	Family	Recorded from
AMPHIBIA			
Rectopryne borbonica		Atelophidae	UK
Bufo asper	Kodok	Bufonidae	HO, UK
Bufo biporcatus	Kodok	Bufomidae	HO, UK
Kalophrynus pleurostigma	Kintal	Microhylidae	UK
Kaloula baleata	Blentuk	Microhylidae	
Microhyla achatina		Microhylidae	UK
Microhyla palmipes		Microhylidae	PE, UK
Leptobrachium hasselti		Pelobatidae	UK
Rana cancrivora	Katak	Ranidae	PA, UK
Rana chalconota	Katak	Ranidae	UK
Rana kuhlii	Katak	Ranidae	UK
Rana limnocharis	Katak	Ranidae	UK
Rana macrodon	Katak	Ranidae	PA, UK
Rana microdisca	Katak	Ranidae	PE, UK
Rana nicobariensis	Katak	Ranidae	PE, UK
Oceidozyga laevis		Ranidae	UK
Oceidozyga lima		*Ranidae*	*HO*
Polypedatus leucomystax	Katak pohon	Rhacophoridae	PA, PE, UK
Rhacophorus javanus		Rhacophoridae	?, UK
REPTILIA Ophidia			
Pytnon reticulatus	Ular sanca kembang	Boidae	HO,PA,PE,UK
Python molurus	Ular sawah	Boidac	UK
Ahaetulla ahaetulla	Ular tambang	Colubridae	HO, PE, UK
Boiga dendrephyla	Ular cincin mas	Colubridae	PA
Chysopelea paradisi	Ul r jelutung	Colubridae	PE, UK
Dryophis prasinus	Ular tambang	Colubridae	PA, PE, UK
Gonyosoma oxycephalon	Ular bangka laut	Colubridae	PA, PE, UK
Lycoden subsinctus	Peniru ular	Colubridae	UK
Oligodon bitor uatus	Ular kebun	Colubridae	PA, PE
Psammodynastus pulverulentus	Ular berintik	Colubridae	PA, PE, UK
Maja naja sputatrix	Ular sendek	Elapidae	UK
Thalassophis anemalus	Ular laut	Hydrophiidae	UK
Agkistrodon rhodostoma	Ular tanah	Viperidae	UK
Trimeresurus albolabris	Ular hijau	Viperidae	UK
Crocodylia			
Crocodylus poresus	Buaya	Crocodylidae	PA, UK
Tomistoma schlegalii		Crocodylidae	PA
Lacertilia			
Calotes jubatus		Agamidae	PE, UK
Draco haematopogon		Agamidae	PE, UK
Draco volans	Cicak terbang	Agamidae	PE, UK
Genyocephalus chamaeleontinus		Agamidae	PA, UK
Gymnodactylus marmoratus		Gekkonidae	PA, PE, UK
Gekko gecho	Tokkeh	Gekkonidae	PE, UK
Hemidactylus frenatus	Cicak	Gekkonidae	PE, UK
Hamiphyllodactylus typus		Gekkonidae	UK
Lepidodactylus lugubris		Gekkonidae	PE, UK
Peropus mutilatus		Gekkonidae	PA
Lygosoma atrocostatum		Scincidae	PA
Lygosoma olivacca		Scincidao	Lubuan
Lygosoma sanctum		Scincidae	PE, UK

Lygosoma striolatum		Scincidae	UK
Lygosoma temminckii		Scincidae	UK
Mabuya multifasciatus		Scincidae	HO, PE, UK
Mabuya rugifera		Scincidae	PE, UK
Varanus salvator	Biawak	Varanidae	UK,HO,PE,PA
Testudines			
Chelonia mydas	Penyu hijau	Cheloniidae	PA, UK
Cuora amboinensis	Kura kura	Testudinidae	UK

3) Preliminary Checklist of the Birds of Ujung Kulon

Mainly based on records of A. Hoegenwerf

UK : Ujung Kulon
HO : Gunung Honge
PE : Pulau Peucang
PA : Pulau Panaitan

B : Resident, breeeding recorded or presumed
N : Migrant, usually present in the northern winter (October-February)
\+ : Recorded in the reserve
\- : Not recorded

Scientific name	English	Indonesian	Recorded from HO	UK	PE	PA
PODICIPEDIDAE						
Podiceps ruficollis	Little grebe		-	B	-	-
HYDROBATIDAE						
Oceanites oceanicus	Swinhoe's storm-petrel	-	B	-	-	
Oceanodroma monorchis	Wilson's storm-petrel	-	-	-	+	
SULIDAE						
Sula leucogaster	Brown booby		-	+	-	+
Sula sula	Red-footed booby		-	+	-	+
PHALACROCORACIDAE						
Anhinga melanogaster	Oriental darter	Pecuk ular	-	B	-	-
Phalacrocorax niger	Little cormorant	Pecuk hitam	-	B	-	-
Phalacrocorax sulcirostris	Little black cormorant	Pecuk hitam kecil	-	B	-	-
FREGATIDAE						
Fregata ariel	Lesser frigate bird	Bientayong kecil	-	+	-	-
ARDEIDAE						
Ardea cinerea	Grey heron	Cangak abu	-	B	-	+
Ardae purpurea	Purple heron	Cangak merah	-	B	-	+
Ardea sumatrana	Great-billed heron	Cangak besar	-	B	-	B
Ardela speciosa	Javan pond heron	Blekok ireng	-	B	-	+
Bubulcus ibis	Cattle egret	Kuntul kerbau	-	B	-	-
Butcrides striatus	Little heron	Kekokan laut	-	B	-	+
Dupeter flavicollis	Black bittern	Tomtomman,tototan	-	B	-	-
Egretta alba	Great egret	Bango putih besar	+	B	-	+
Egretta garzetta	Little egret	Bango putih kecil	-	B	-	-
Egretta intermedia	Plumed egret	Bango putih	+	B	-	+
Egretta sacra	Pacific reef egret	Bango air	-	B	-	-
Gorsachius melano-lophus	Malayan night heron	Walang kada	-	N	-	-
Ixobrychus cinnamomeus	Cinnamon	Ayam ayaman	-	B	-	-
Nycticorax nycticorax	Night heron	Kowak, kuntul malam	-	B	-	+
CICONIDAE						
Ciconia episcopus	Woolly-necked stork	Sandang-lawe	-	B	-	+
Ibis cinercus	Milky stork	Bluwok, walang hada	-	B	-	-
Leptoptilos javanicus	Lesser adjudant	Bango botak	-	B	-	+
ANATIDAE						
Cairina scutulata	White-winged duck	Itik liar	-	+	-	-
Dendrocygna javanica	Lesser tree duck	Beliwis	-	+	-	-
PANDIONIDAE						
Pandion haliaetus	Osprey		-	B	+	+

ACCIPIRIDAE						
Accipiter trivirgatus	Crested goshawk	Alap-alap	-	B	-	-
Accipiter virgatus	Besra, Asiatic sparrow hawk	Aap-alap burung Alap-alap burung	-	+	-	-
Butaster liventer	Rufous-winged buzzard		-	B	-	-
Elanus caeruleus	Black-shouldered kite	Alap-alap tikus	-	B	-	-
	White-bellied sea eagle	Ulung laut	-	B	-	+
Haliaster indus	Fish eagle	Ulung ulung ikan	-	B	-	+
Ichyophaga ichthyaetus	Grey-headed fish-eagle	Ulung peikan	-	B	-	+
Ictinaetus malayensis	Black eagle	Ulung ulung hitam	-	B	-	-
Pernis apivorus	Crested honey-buzzard	Ulung ulung	-	+	-	-
Spilornis cheala	Crested serpent-eagle	Ulung ular, bido	-	B	-	+
Spizaetus cirrhatus	Changeable hawk-	Ulung brontok, ruyuk	-	B	-	-
FALCONIDAE						
Falco cenchroides	Nanheen kestrel	Alap alap	-		-	-
Falco moluccensis	Spotted kestrel	Alap alap sapi	-	B	-	-
Falco peregrinus	Peregrine hobby	Alap alap kawah	-	-	-	+
Falco severus	Oriental hobby	Alap alap macan	-	B	-	-
PHASIANIDAE						
Coturnix chinensis	Blue-breasted quail	Puyuh, pepiko	-	B	-	-
Gallus gallus	Red jingle-fowl	Ayam bekiko	-	B	-	B
Gallus varius	Green jungie-fowl	Ayam hutan	-	B	-	-
Pavo muticus	Green peafowl	Merak	-	B	B	-
TURNICIDAE						
Turnix suscitator	Barred buttonquail	Puyuh	-	3	-	+
RALLIDAE						
Amaurornis phenicurus	White-breasted waterhen	Tertuak	-	B	-	+
Gallinula chloropsis	Common moorhen	Comperlak, mancar batu	-	B	-	-
Porzana fusca	Ruddy-breasted quail		-	B	-	-
Rallus striatus	Slaty-breasted quail	Burung beker	-	B	-	+
JACANIDAE						
HYdrophasianus chrurgus	Pheasant-tailed jacana		-	N	-	-
Metopidius indicus	Bronze-winged jacana	Pischigan	-	B	-	-
CHARADRIDAE						
Charadrius alexandrinus	Kentish plover		-	N-	-	-
Charadrius dubius	Little ringed plover		-	N	-	-
Charadrius leschenaultii	Greater san-plover	Cerek	-	N	-	+
Charadrius mongolus	Mongolian plover		-	N	-	-
Charadrius peronii	Malaysian plover		-	+	-	-
Charadrius veredus	Criental plover		-	N	-	-
Pluvialus dominica	Losser golden plover	Trulek	-	N	-	+
Pluvialus squatarola	Grey plover		-	-	-	+
SCOLOPACIDAE						
Actitis hypoleucos	Common sandpiper	Tiril, trinil segoro	+	N	+	+
Arenaria interpres	Ruddy turnstone	Titil karang	-	N	-	+
Calidris ferruginea	Curlew sandpiper		-	N	-	-
Calidris subminuta	Long-toed stint		-	N	-	-
Crocethia alba	Sanderling		-	N	-	-
Gallinago stenura	Pintail snipe	Burung snip, blekek	-	N	-	-
Heteroscelus brevipes	Grey-tailed tattler		-	N	-	-
Numenius arquata	Eurasian curlew	Srindik	-	N	-	-
Numenius madagascariensis	Eastern curlew	Gajahan	-	N	-	+
Numenius phaeopus	Whimbrel	Gahahana	-	N	-	+
Tringa glareola	Wood sandpiper	Titil, trilil	-	N	-	-
SCOLOPACIDAE						
Tringa nebularia	Common greenshank		-	N	-	+
Tringa totanus	Common redshank		-	N	-	-
BURHINIDAE						
Esacus magnirostris	Great thich-knee	Beket laut	-	B	+	+

GLAREOLIDAE						
Glareola maldivarum	Oriental pratincole		-	N	-	-
LARIDAE						
Anous stolidus	Brown noddy		+	-	-	?
Chlidonias leucopterus	White winged tern		-	N	-	-
Sterna albifrons	Little tern		-	+	-	-
Sterna anaethetus	Bridled tern		-	B	-	+
Sterna bengalensis	Lesser crested tern		-	N	-	-
Sterna beroij	Great crested tern	Derah laut	-	B	-	+
Sterna dougallii	Roscate tern		-	B	-	-
Sterna sumatrana	Black-naped tern		-	B	-	B
COLUMBIDAE						
Chalcophaps indica	Green-winged pigeon	Walik tanah	-	B	-	+
Ducula aenea	Green imperial pigeon	Pergan	-	B	-	+
Ducula bicelor	Pied imperial pigeon	Pergan	-	B	-	-
Geopelia striata	Peaceful dove	Perkutut	-	B	-	+
Macropygia phasianella	Red cuckoo dove	Burung unchal unchal	-	B	-	+
Macropygia ruficeps	Little cuckoo-dove	Derkuku-sopa	-	B	-	-
Streptopelia bitorquata	Brown spotted dove	Burung baster, putar	-	B	-	+
Streptopelia chinensis	Spotted dove	Tekukur, dero	-	B	-	-
Treron griseicauda	Grey-chacked pigeon	Katik (punai)	-	B	-	-
Treron vernans	Pink-necked pigeon	Katik, punai, joji	-	B	-	+
Ptilinopus malanespila	BNlack-naped fruit pigeon		-	B	-	-
PSITTASIDAE						
Loriculus vernalis	Vernal hanging parrot	Serindit	-	B	-	-
Psittacula alexandri	Red-breasted parakeet	Betet	-	B	-	-
CUCULIDAE						
Cacomantis merulinus	Plaintive cuckoo	Kedasi, srit uncing	-	B	-	-
Cacomantis variolosus	Brush cuckoo	Kedasi, srit uncing	-	B	-	-
Cacomantis sonneratii	Banded bay-cuckoo	Kedasi lurk	-	B	-	-
Centropus bengalensis	Lesser coucal	Bubut	-	B	-	-
Centrepus nigrerufus	Coucal		-	B	-	-
Centropus sinensis	Greater coucal	Dudut candung	-	B	-	-
Chrysococcyx malayanus	Malayan bronze cuckoo		-	B	-	-
Clamator coromandus	Chestnut=winged cuckoo	Lontrok jambul	-	N	-	-
Cuculus fugax	Hondgson's hawk-cuckoo		-	+	-	-
Cuculus micropterus	Indian cuckoo	Belanda mabuk	-	B	-	-
Cuculus poliocephalus	Lesser cuckoo	Set gung gung	-	B	-	-
Cuculus saturatus	Oriental cuckoo		-	N	-	-
Eudynamus scolopacea	Common koel	Olek okek, tuhu	-	B	-	-
Phaenicophaeus curvirostris	Chesnut-breasted malkoha	Sintok, mendu	-	B	-	-
Phaenicophaeus javanicus	Red-billed malkoho	Lontrok	-	B	-	-
Surniculus lugubris	Drongo cuckoo	Kedasi hitam	-	B	-	-
STRIGIDAE						
Ketupa ketupa	Buffy fish-owl	Bloketupu	-	B	-	-
Otus bakkamoena	Collared scops-owl	Burung hantu, celepuk	-	B	-	+
Strix seloputo	Spotted wood-owl	Kukuk beluk, serak hitam	-	B	-	-

CAPRIMULGIDAE						
Caprimulgus affinis	Savanna nightjar	Burung malam	-	+	-	-
Caprimulgus macrurus	Large-tailed hightjar	Burung malam	-	B	-	+
APODIDAE						
Apus affinis	House swift		-	B	-	B
Aplus pacificus	Fork-tailed swift		-	B	-	-
Chaetura celebensis	Bartels' spinetail swift		-	+	-	-
Collocalia esculenta	White-bellied swiftlet	Walet, kucapi	-	B	-	-
Collocalia fuciphaga	Edible-nest swiftlet	Burung walet	+	B	+	-
Cypsiurus batasiensis	Asian palm swift	Burung kendali	-	B	-	B
Hirundapus ciganteus	Brown needle-tail		-	B	-	-
Rhapidura leucopygialus	Silver-rumped swift		-	B	-	-
HEMIPROCNIDAE						
Hemiprocne longipennis	Grey-rumped treeswift	Kapinis pohon	-	B	-	+
ALCEDINIDAE						
Alcedo caarulescens	Small blue kingfisher	Burung udang kecil	-	B	-	-
Alcede meninting	Blue-cared kingfisher	Burung udang biru	-	B	-	-
Ceyx rufidorsus	Rufeus-backed kingfisher	Burung udang merah	-	B	-	+
Haleyon chloris	White-cellared kingfisher		+	B	+	+
Halcyon coromanda	Ruddy kingfisher		-	B	-	+
Halcyon cyanovantris	Javan kingfisher	Kakok gunung	-	B	-	+
Laccdo pulchella	Banded kingfisher		-	B	-	-
Pelargopsis capensis	Stork-billed kingfisher	Burung raja udang	-	B	-	+
MERCPIDAE						
Merops leschenaulti	Chestnut-headed bee eater	Burung langir, cina	-	B	-	-
Merops philippinus	Blue-tailed bee-eater	Birk-birik, kacangan	-	B	-	+
Merops viridis	Blue-threated bee-eater	Burung cina	-	B	-	-
CORACIIDAE						
Eurystomus orientalis	Dollarbird		-	B/N	-	-
BUCEROTIDAE						
Anthracoceros convexus	Scuthern pied hornbill	Rangkong, kangkareng	-	B	+	+
Buceros rhineceros	Rhineceros hornbill	Rangkong	-	B	-	-
Rhyticeros undulatus	Wreathed hornbill	Burung taon, julang	-	B	+	+
CAPITONIDAE						
Megalaima australis	Blue-eared barbet	Tengeret, truntung	-	B	-	?
Megalaima haemacephala	Coppersmith barbet		-	B	-	-
Megalaima javensis	Javen barbet	Benteluk, tulang turmpuk	-	B	-	-
Megalaima lineata	Lineated barbet	Bultik, bututut	-	B	-	-
PICIDAE						
Chrysocolaptes validus	Orange-backed woodpecker	Caladi hundang hutan	-	B	-	-
Dinopium javanensa	Common geldenback	Caladi, platuk	-	B	-	-
Dryecopus javensis	Great black woodpecker		-	-	-	+
Mulleripicus pulverulentus	Great slaty woodpecker		-	-	-	+
Picoides moluccensis	NBrown-capped woodpecker	Caladi tilik	-	B	-	+
Picus miniaceus	Banded woodpecker	Platuk gunung	-	B	-	-
Picus vittatus	Bamboo green woodpecker	Platuk gunung	-	B	-	-
Sasia abnormis	Rufous piculet		-	B	-	-
PITTIDAE						
Pitta guajana	Banded pitta	Burung paok	-	B	-	-
Pitta scrdida	Green-breasted pitta	Burung paok hijau	-	+	-	-
HIRURDINIDAE						
Delichon dasypus	Asian house martin		-	N	-	-
Hirundo daurica	Red-rumped swallow	Burung walet	-	B	-	-
Hirundo rustica	Barn swallow	Burung kepinis, walat	-	N	-	+
Hirindo tahitica	Pacific swallowq	Burung kepinis, walat	-	B	-	-

CAMPEHAGIDAE						
Cerácina novaehollandiae	Large cuckoo-shrike		-	B	-	-
Hemipus hirundinaceus	Black-winged flycatcher-shrike	burung kembang durian	-	B	-	-
Lalage nigra	Pied triller	Kapasan, nuncang	-	B	-	-
Pericrocotus cinnamomeus	Small minivet	Burung sepah, cabeang	-	B	-	-
Pericrocotus flammeus	Scarlet minivet		-	B	-	-
CHLOROPSIDAE						
Aegithina tiphai	Common iera	Cipeu, tipo	-	B	-	-
Chloropsis conchinchinensis	Blue winged fcafbird	Burung daun	-	B	-	-
Chloropsis sonnerati	Greater green feafbird		-	B	-	-
PYCNOHOTIDAE						
Criniger bres	Grey-cheeked bulbul	Burung janggut, kortes	-	B	-	-
Pycnonotus atriceps	Black-headed bulbul	Kuricang	-	B	-	+
Pycnonotus aurigaster	Sooty-headed bulbul	Kutilang	-	B	-	-
Pycnonotus goisavier	Yellow-vented bulbul		-	B	-	+
Pycnonotus melanicteris	Black-crested bulbul		-	B	-	-
Pycnonotus plumosus	Olive-winged bulbul		-	B	-	+
Pycnonotus simplex	VCream-vented bulbul		-	B	-	-
Pycnonotus zeylanicus	Straw-headed bulbul		-	B	-	+
DICRURIDAE						
Dicrurus hottentottus	*Spangled drongo*	*Saeran*	-	-	-	+
Dicrurus macrocercus	Black drongo	Saeran gunting, sringunting	-	B	-	-
Dicrurus paradiseus	Greater racket-tailed	Saeran	-	B	-	+
ORIOLIDAE						
Irena puella	Asian fairy-bluebird		-	B	-	-
Oriolus chinensis	Black-naped oriole	Celalodang	-	B	-	+
CORVIDAE						
Corvus enca	Slender-billed crow		-	B	-	+
Corvus macrorhynchus	Large-billed crow		-	B	-	-
Crypsirina temia	Racket-tailed treepie		-	B	-	-
SITTIDAE						
Sitta frontalis	Velvet-fronted nuthatch	Caladi luvut	-	B	-	-
TIMALIIDAE						
Macronous gularis	Striped tit-babbler		-	B	-	-
Macronous kelleyi	Grey-faced tit-babbler		-	B	-	-
Malacopteron cinereum	Scaly-crowned babbler		-	B	-	-
Mapothera macrodactyla	Large wren-babbler	Burung tikus	-	B	-	-
Pellorneum capistratum	Black-capped babbler	Kancilan	-	B	-	-
Stachyris grammiceps	Javan white-breasted babbler		-	B	-	-
Stachyris melanotherax	Pearl-cheecked babbler	Burung tepus	-	B	-	-
Timalia pileata	Chestnut-capped babbler		-	B	-	-
Trichastoma pyrrogenys	Temminck's babbler		-	B	-	-
Trichastoma sepiarium	(Kancilan) Horsfield's babbler	(Ksancilan)	-	B	-	-
TURDIDAE						
Cepsychus malabaricus	White-rumped shama	Kucica hutan	-	B	-	-
Copsychus saularis	magpie robin	Kucica	-	B	-	+
Enicurus leschenaulti	White-crowned forktail	meninting besar	-	B	-	-
Zoothera citrina	*Orange-headed trush*	Burung anka	-	B	-	-
Zoothera interpres	Chestnut-capped trush	Andis	-	B	-	-
SYLVIIDAE						
Cisticola exilis	*Streaked fantail-warbler*	*Burung padi*	-	B	-	-
Gerygone sulphurea	Flyeater		-	B	-	-
Orthotemus ruficeps	Ashy tailerbird	Cenene, cici	-	B	-	+
Orthetemus suturies	Common tailerbird	Cenene, cici	-	B	-	-

Phyllescepus borealis	Arctic warbler		-	N	-	-
Prinia familiaris	Bar-winged wren-warbler	Pacikrak	-	B	-	-
Prinia polychora	Brown prinja	burung waju, pacikrak	-	B	-	-
Prinia subflava	Tawny-flanked prinia	Cici, pacikrak	-	B	-	-
MUSCICAPIDAE						
Cyornis banyumas	Hill blue flycatcher	Cacing kecil, tila biru	-	B	-	+
Cyornis rufigastra	Mangrove blue flycatcher		-	B	-	+
Hypothymis azurea	Black-naped monarch		-	B	-	+
Ruscicapa latirostris	Asian brown flycatcher	Bubik	-	N	-	-
Philentoma velatum	Maroon-breasted flycatcher		-	B	-	-
Rhipidura javanica	Pied fantail	Burung kipas, sikatin	-	B	-	+
Terpsiphone paradist	Astan paradise-flycatcher		-	B	-	-
PACHYCEPHALIDAE						
Pachycephala cinerea	Mangrove-whistler		-	B	-	+
MOTACILLIDAE						
Anthus novaeseelaandiae	Richad's pipit		-	B	-	-
Dendronanthus indicus	Forest wagtail	Kemiri, tod leuncang	-	N	-	-
Motacilla cinerea	Grew wagtail	Kecuit kerbau, limjana	-	N	-	-
Motacilla flava	Yellow wagtail		-	N	-	+
ARTAMIDAE						
Artamus leucorhynchus	Swallow-shrike	Kekep	-	B	-	+
LANIIDAE						
Lanius cristatus	Brown shrike	Bentet merak, tud	-	N	-	-
Lanius schach	Long-tailed shrike	Bentet, tud	-	B	-	-
STURNIDAE						
Aplonis panayensis	Tree starling	Cemperling	-	B	-	+
Gracula religiosa	Hill myna		+	B	-	-
Sturnus contra	Asian pied starling		-	B	-	-
Sturnus javanicus	Jungle myna		-	B	-	-
NECTARINIIDAE						
Aethopyga mystacalis	Scarlet sunbird	Burung madu merah	-	B	-	-
Aethopyga siparaja	Crimson sunbird	Burung madu merah	-	-	-	+
Anthreptes malacensis	Brown-throated sunbird	Burung madu kelapa	-	B	-	+
Anthreptes singalensis	Ruby-cheeked sunbird	Burung madu	-	B	-	-
Arachnothera longirostra	Little spiderhunter	Burung jantung	-	B	-	-
Arachnothera affinis	Grey-breasted spider-hunter	Klaces	-	B	-	-
Mectarinia jugularis	Cliye-bnacked sunbird	Burung madu kuning	-	B	-	+
Mectarinia sperata	Purple-throated sunbird	Burung madu merah	-	-	-	+
DICAEIDAE						
Dicaeum trigonostigma	Orange-bellied flower-pecker	Burung cabe gunung	-	B	-	-
Dicaeum trochileum	Scarlet-breasted flower-pecker	Burung cabe	-	B	-	+
PLOCEIDAE						
Erythrura prasina	Pin-tailed parrotfinch	Binglis (using)	-	-	-	+
Lonchura leucogastra	White-bellied munia	Bondol	-	B	-	-
Padda oryzivora	Java sparrow		-	B	-	-

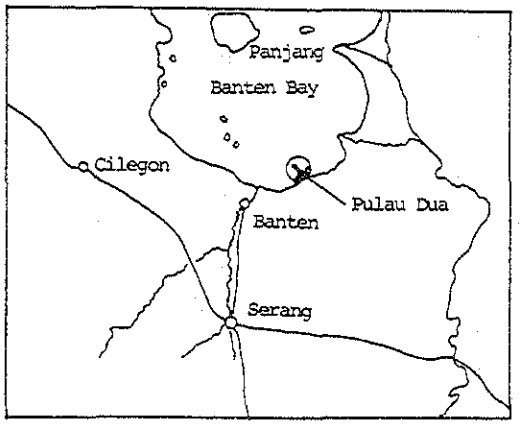
Table I(F)-4 NATURE RESERVE & RECREATION PARK IN THE STUDY REGION

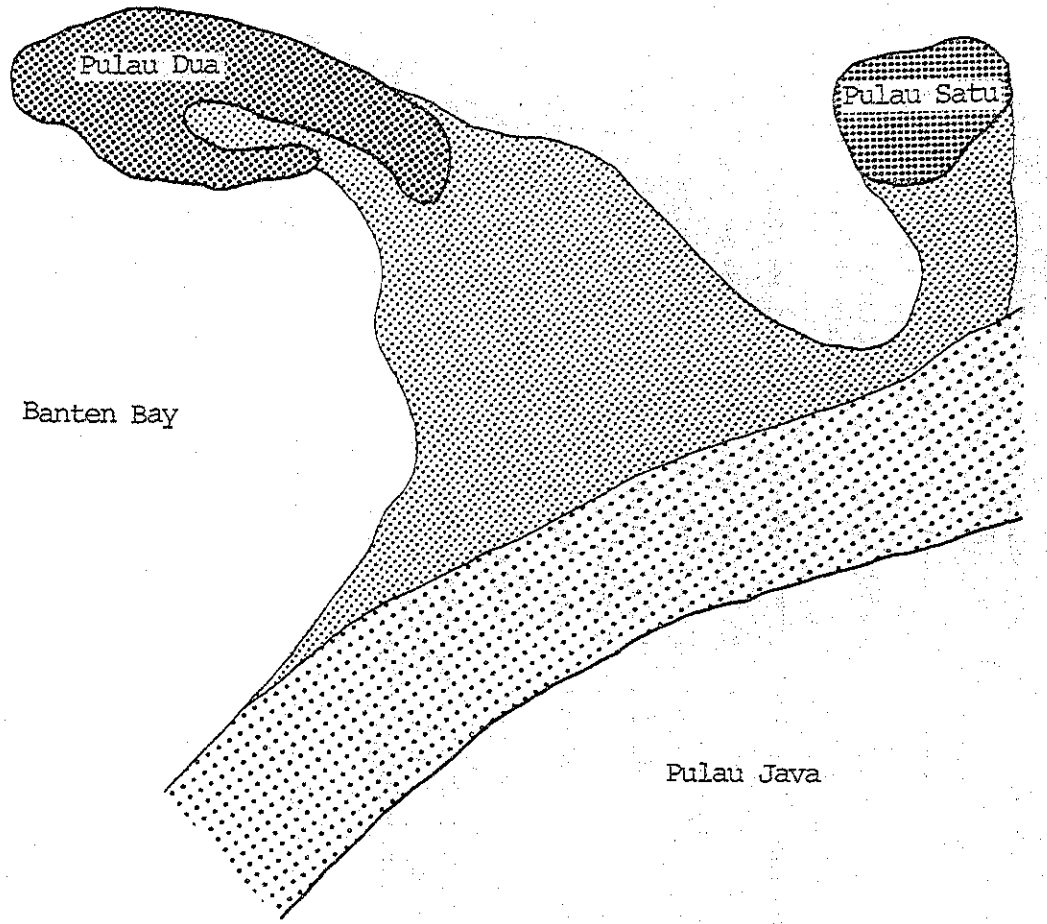
	Name	Area	Location	Kind of Natural Reservation	Year of Stipulation
1.	Pulau Sangiang	700 ha	Kab. Serang	Nature Reserve	1985
2.	Pulau Dua	30 ha	Kab. Serang	Nature Reserve	1984
3.	Rawa Danau	2,500 ha	Kab. Serang	Nature Reserve	1921
4.	Carita	95 ha	Kab. Pandeglang	Taman Wisata	1978
5.	Tukung Gede	1,700 ha	Kab. Serang	Nature Reserve Adjacent Danau	1979

Source: Statistik Kehutanan,Balai Konservasi Sumberdaya Alam III, Bogor, 1986, Direktorat Jenderal Perlindugan Hutan dan Pelestarian Alam

Legend

- Pulau Dua Nature Reserve
- Proposed Extension of Nature Reserve (The beach at ebb tide)
- Brackish Water Pond Area





Source : Directorat Taman Nasional dan Hutan Wisata

Non-scale

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Fig. I(F)-2
PRESENT STATUS OF PULAU DUA NATURE RESERVE

Ibises, Glossy Ibis, Egrets, Night Herons, Darters, Storks, Mynas, Starlings, Kingfishers, Sand Pipers, Cormorants and Herons have a large resident population during the breeding season (March to July). The total number of the species amounts to about 50 comprising 7,000 birds. But recently it has been last three species of colonial birds and two species of raptor. The list of bird species recorded by the recent survey are shown in Table I(F)-5.

Rawa Danau reserve with more than 1,000 ha of virgin swamp forest, is located in a caldera formed in the upper part of the Cidanau river basin in Kab. Serang. A rich flora with one endemic Javan species, Alocasia Bantamesis can only be found here. A rich and varied wildlife are observed with Crocodiles, three primate species, leopards, porcupines and a variety of birds [See Fig. I(F)-3 and Table I(F)-6].

The reserve, surrounded by residential and the agricultural areas, is menaced by a gradual invasion of farmers. The reserve area of 3,791 ha in 1921 was reduced to 2,5000 ha in 1986 by illegal farming.

Tukung Gede designated as natural reserve in 1979 consists of lowland rain forests and swamp forests covering a total area of 1,700 ha. This is only a substantial stretch of the lowland rain forest in West Java. Neither tourism facilities nor guard houses for the environmental preservation are established up to the present in the reserve.

Pulau Sangiang, an island with an area of 700 ha located 15 km west from Merak, has been designated as a new natural reserve in 1985. As no tourism facilities nor guard houses have been established in the island, small private tourism development projects could be promoted by local entrepreneurs.

Carita Taman Wisata, the scenic hill forest with an area of 95 ha near Carita beach, is designated as the Taman Wisata (Recreation Park) in 1978 for educational and recreational

purposes. There exist public guest houses owned by the Department of Agriculture from where visitors can enjoy the panorama of the Carita bay.

Table I(F)-5 BIRD SPECIES RECORDED DURING EIGHT VISITS TO PULAU DUA

Species	English	Status
Phalacrocorax niger	Little ormorant	Cb-A
P. Sulcirostris	Little black cormorant	Cb-A
Anhinga melanogaste	Oriental darter	V-C
Fregata andrewsi	Christmas frigatebird	V-R
Ardea sumatrana	Great-billed heron	V-R
Ardea cinerea	Grey heron	Cb-C
Ardea purpurea	Purpule heron	V-C
Butorides striatus	Little heron	(B)-A
Ardeola speciosa	Javan pond-heron	Cb-A
Bubulcus ibis	Cattle egret	Cb-A
Egretta sacra	Pacific reff-egret	Cb-C
Egretta alba	Great egret	Cb-C
Egretta intermedia	Plumed egret	Cb-C
Egretta garzetta	Lettle egret	Cb-A
Nycticorax nucticorax	Black-crowned night heron	Cb-A
Ixobrychus cinnamomeus	Cinnamon bittern	V-R
Mycteria cinerca	Milky stork	V-C
Threskiornis melanocephalus	Black-headed ibis	V-C
Plegadis faci nellus	Glossy ibis	Cb-C
Anas gibberifrons	Grey teal	V-C
Nettapus coromandelianus (AL)	Cotton pygmy goose	V-R
Pandion haliaetus	Osprey	V-R
Pernis apivorus (GA)	Eurasian honey buzzard	M-Sa
Haliastur indus	Brahminy kite	V-Ln
Haliaeetus leucogaster	White-bellied sea-eagle	V-Ln
Accipiter gularis (GA)	Japanese sparrowharwk	M-Sa
Aciipiter soloensis (GA)	Chinese goshawk	M-Sa
Falco peregrinus (GA)	Peregrine falcon	M-SA
Turnix suscitator	Barred buttonquail	(B)-C
Amaurornis phoenicurus	White-breasted waterhen	B-C
Rallus striatus	Slaty-breasted rail	V-C
Pluvialis dominica	Lesser golden plover	M-Sa
Pluvialis squatarola	Grey plover	M-R
Charadrius leschenaulti	Greateer sand-plover	M-R
Charadrius mongolus	Mongolian plover	M-R
Charadrius veredus	Oriental plover	M-R
Numenius arquata	Eurasian curlew	M-C
Tringa totanus	Common redshank	M-C
Tringa stagnatilis	Marsh sandpiper	M-C
Tringan glareola	Wood sandpiper	M-Sa
Xenus cinereus	Terek sandpiper	M-R
Actitis hypoleucos	Common sandpiper	M-A
Calidris ruficollis	Rufous-necked stint	M-Sa
Calidris ferruginea	Curlew sandpiper	M-Sa
Chilidonias leucopterus	Shite-winged tern	M-C-Sa
Treron vernans	Pink-necked pigeon	V-R
Streptopelia bitorquata	javanese turtle-dove	B-A
Streptopelia chinensis	Spotted dove	V-R
Geopelia striata	Peaceful dove	B-A
Tyto alba	Barn owl	V-R
Ketupa ketupa	Buffy fish-owl	V-R
Caprimulgus affinis	Savanna nightjar	(B)-C
Collocalia esculenta	White-bellied swiftlet	V-C
Alcedo caeruslescens	Small blue kingfisher	(B)-C
Halcyon chloris	Collared kingfisher	(B)-C
Halcyon sancta	Sacred kingfisher	M-C

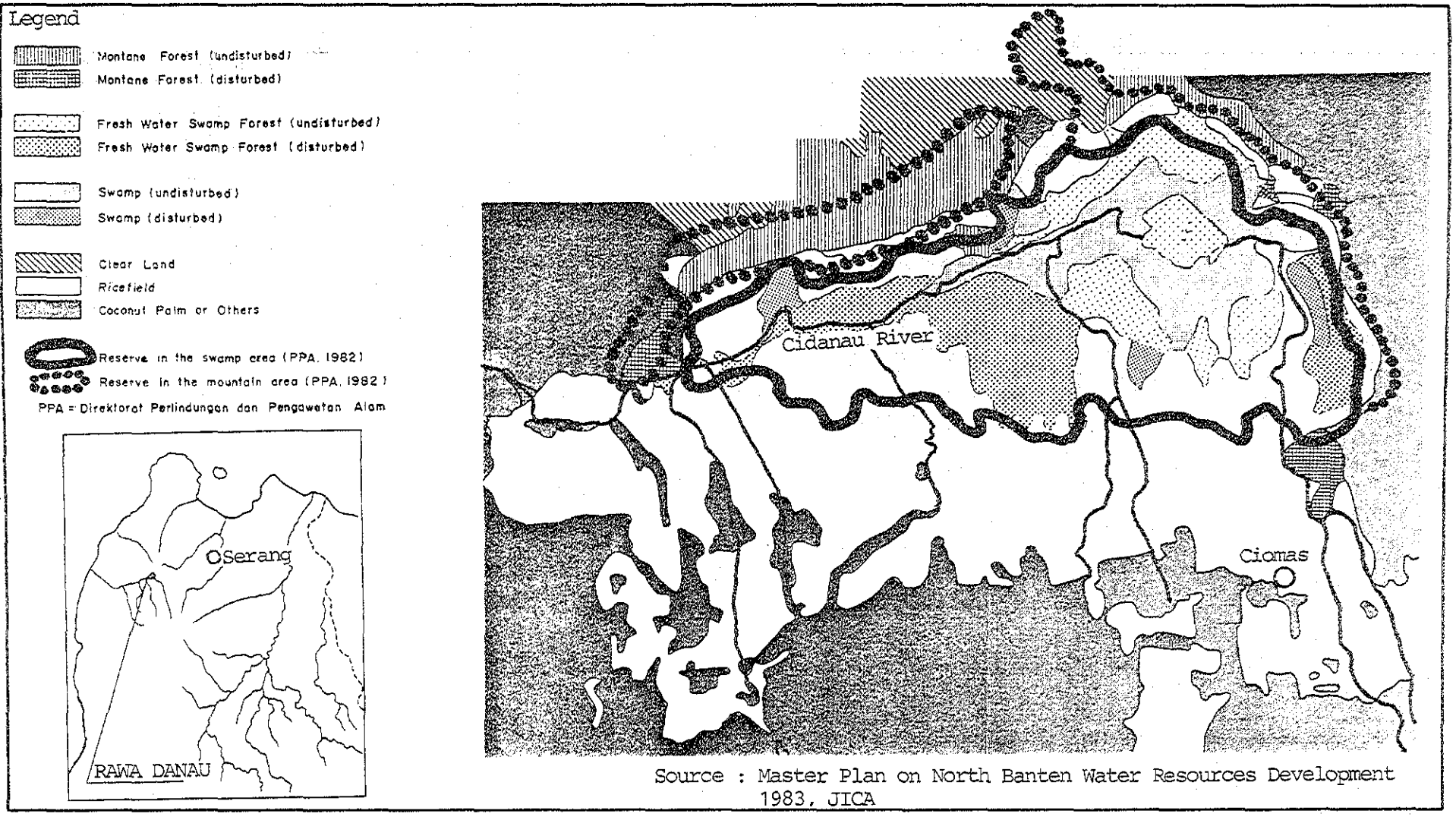
Merons philippinus	Blue-tailed bee-eater	M-C-Sa
Hirundo rustica	Barn swallow	M-C
Hirundo tahitica	Pacific swallow	V-C
Delichon dayspus	Asian house-martin	M-R
Pyconotus goiavier	Yellow-vented bulbul	(B)-C
Oriolus chinensis	Black-naped oriole	V-R
Corvus macrorhynchos	Large-billed crow	V-Ln
Copsychus saularis	Magpie robin	B-C
Gerygone sulphurea	Flyeater	B-C
Phylloscopus borcealis	Arctic warbler	M-R
Acrocephalus sp	Great reed-warbler sp	M-Ln
Prinia familiaris	Bar-wingerd prinia	B-A
Cisticola juncidis	Zitting cisticola	V-R
Orthotomus sutorius	Common tailorbird	V-Ln
Culicicapa celyonensis	Grey-headed flycatcher	V-R
Rhipidura javanica	Pied fantail	(B)-C
Artamus leucorhynchos	White-breasted wood swallow	V-C
Sturnus contra	Asian pied starling	V-C
Sturnus melanopterus	Balekwinged starling	V-C
Sturnus sturninus	Purple-backed starling	M-R
Acridotheres javanicus	White-vented myna	V-C
Antreptes malacensis	Brown-throated sunbird	V-C
Nectarinis jugularis	Olive-backed sunbird	(B)-C
Arachnothera longirostris	Little spinderhunter	V-R
Dicaeum trochileum	Scarlet-headed flower pecker	(B)-C
Zosterops flava	Javan white-eye	V-C
Ploceus manyar	Streajed weaver	B-C
Lonchura leucogastroides	Javan munia	V-R
Lonchura maja	White-headed munia	B-C
Lonchura punctulata	Sacaly-breasted munia	V-R
Lonchura mallaca	Chestnut munia	V-R

Remarks: Dates of visitation were: 25-28.2.84, 3-6.8.84, 3-6.10.84, 21-22.2.85, 31.3-2.4.85, 4-8.3.85, 13-15.4.85 and 13-15.6.85.

Abbreviations of Status:

- B : Breeding
- (B) : Presumed breeding
- Cb : Colonial breeding
- M : Migrant
- V : Visitor
- A : Abundant regularly greater than 50 individuals or breeding pairs
- C : Common (regularly 6-49 individuals or breeding pairs)
- Ln : Low number (regularly 5 or less individuals or breeding pairs)
- R : Rare (seen only occasionally or in low numbers)
- Sa : Sometimes abundant

Sources: Population Census, Nest Density, Habitat Utilization, and Management Recommendations for Birds Nesting on the Nature Reserve PULAU DUA, WEST JAVA, 1986.



Source : Master Plan on North Banten Water Resources Development 1983, JICA

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Fig. I(F)-3

PRESENT STATUS OF RAWA DANAU NATURE RESERVE

Table I(F)-6 FAUNA AND FLORA IN THE RAWA DANAU RESERVE

Fauna				Flora		
	Zoological Name	Local Name	Popular Name	Botanical Name	Popular or Local Name	Characteristics, Usage
Vertebrates				Moraceae		
Fishes	Monopterus albus		Beluga	Artocarpus elasticus	Teureup	Food, fiber, timber, gum, paper
	Ciarias batrachus		Catfish			
	Purttius binotatus					
	Ophiocephalus melanopterus			Olacaceae		
				Strombosia javanica	Kikacang	Forest tree food (leaves)
Reptiles	Varanus sps.	Blawak	Iguana	Euphorbiaceae		
	Trionyx cartilagineus		Turtle	Glochidion sp.	Unknown	Small tree
	(Crocodylus sp.)		Crocodile			
				Meliaceae		
Birds	Anhinga melanogaster	Pecuk ular		Dysoxylum sp.	Kibawang	
	Egretta sp.	Kuntur				
	Bubulcus ibis	Kuntur kerbau		Ancardiaceae		
	Nycticorax sp.	Kowak malam		Monojifera sp.	Unknown	
	Duptor faivicollis	Kokkokan hitam				
	Ixobrychus cinnomomeus			Icacinaceae		
	Dendrocygna javania			Stemonurus secundiflorus	Unknown	Forest tree in swamp food (fruits)
	Halcyon chloris	Raja udang, Cekakak	King fisher			
	Pelargopsis capensis	Raja udang	King fisher	Elaeocarpaceae		
	Alcedo sps.		King fisher	Elaeocarpus sps.	Unknown	Common food (fruits)
	Dicrurus paradiseus		Drongo			
Mammals	(Hylobates moloch)	Owa	Pimata	Sterculiaceae		
	Presbytis aygula	Surili	Primata	Pterospermum sps.	Bajur	Forest tree
	Presbytis sp.	Lutung	Primata			
	Macaca sp.	Bokoi	Primata	Apocynaceae		
	Panthera pardus	Macan tutul	Panther	Alstonia sps.	Gabus	
	(Nycticebus coucang)	Kukang	Sloth			
	(Tragulus javanicus)	Kancil	Chevrotain	Araceae		
	(Muntiacus muntjak)	Kidang, Muncak	Chevrotain	Alocasia sps.	Unknown	
	Aonyx sp.		Otter			
Inverteb-rates	Unknown					

Remarks: Species in parentheses indicate those according to local information.

Source: FAO, 1977