3.6 Beach and Ocean Activity Area

3.6.1 Existing Conditions of Beach and Ocean Activity

The existing usage pattern of Pattaya beach and Ko Lan is based on the rule of convenience first, both as regards to water front and sea surface usage. In Pattaya, the beach road and parking lots are so close to the beach that it offers very easy access. Tourists can get drinks and food from hawkers without moving and do not have to walk more than 10m to enjoy boat riding because the boats are directly launched from the beach.

This could be a great merit to Pattaya if it was not crowded as a beach resort. But with the growth of tourism, this merit will rapidly change into a demerit. Now, swimming and sun-bathing at the Pattaya beach are disturbed by noisy cars and motorcycles, impudent hawkers and selfish mooring and boating of tourist boats. The rule of convenience first should be replaced by comfort and safety first.

The beaches in Pattaya and Ko Lan are essential to tourism development of Pattaya. Therefore, improvement of the beach has a high priority in the development plan.

The problems identified in this study are as follows:

(a) Beach Road

The road and parking lots are so close to the beach that they make the beach narrow and cause noise problems for sun-bathers. Pattaya beach does not have a green buffer.

(b) Side-walk and Buildings on the Beach

The side-walk and buildings on the beach are too close to the shore-line. This may cause some erosion problems from reflecting waves. Also, sun-bathing tourists are disturbed by pedestrians.

(c) Beach Usage

There is no facility to guard swimmers and boats against accidents. Rubbish bins are installed at some distance, but dangerous materials such as broken beer bottles and glass cups are found lying on the beach.

Hawkers, runners for horse riding and boating and disorderly placed boats will disturb the enjoyment of swimmers and sunbathers.

(d) Sea Surface Usage

Excursion boats, motor boats, scooter boats and sailing boats are moored and driven without any regulation. Designation of a specific area for each ocean-related activity is important for safety and enjoyment. Mooring facilities should be provided at suitable places to avoid boats being placed on the beach.

(e) Detailed sea water conditions are described in the Master Plan

3.6.2 Development Policy

Taking into consideration the tourism resources of Pattaya as an ocean resort previously mentioned, the following three axes may be set to enhance beach and ocean activities in Pattaya.

1. Rest and relaxation
2. Water-contact activities
3. Education

(a) Rest and Relaxation

The impression of Pattaya beach is very peaceful and gentle with a calm sea, white coral reef sand and coconut trees. There is no doubt that Pattaya beach resort can provide a comfortable place for rest and relaxation on the beach with harmonized use of natural resources. As there is some confusion in the existing usage pattern, this excellent factor is not being utilized effectively.

(b) Water-contact Activities

A very calm sea condition and a gentle beach slope can also be most suitable for ocean activities. If a well organized instruction system is established, even beginners are able to enjoy water-contact sports easily and safely.

(c) Education

Pattaya beach is the most popular beach resort in Thailand and has convenient access from Bangkok. For the Thai people, Pattaya is a place to become familiar with water-contact activities and to learn about the ocean. If an educational institute on ocean is established in Pattaya and if part of the facilities are opened to the public, it will become a good attraction to both foreigners and Thais.

3.6.3 Planning Policy

(a) Basic Objectives

Based on the above-mentioned development policy, the basic objectives of planning may be summarized as follows:

1) Beach activity area improvements are composed of the following two components for development of the area

- Beach activity space on the sea shore
- Beach promenade space

2) Sea surface control plans are composed of five sea surface control measures

- Designation of a mooring area for excursion boats.
- Establishment of a sea surface control zone with buoys.
- Control and monitoring of water surface usage by coast guards.
- Establishment of no-sailing, no-boating zones for the safety of human-life and preserving marine biology.
- Promotion of the use of boats without engines so as to establish a new Pattaya beach image. In addition, a limited activity zone for motor boats is set up.

(b) Explanation of the Main Development Components

1) Beach activity space on the seashore

Development of beach activity space on the seashore is composed of four items as follows:

- The conservation of tourism resources
- The promotion of scenic beauty
- The promotion of kinetic space
- The promotion of pleasure

* The conservation of tourism resources

The tourism resources of Pattaya are to be conserved to maintain the scenic beauty, such as Pattaya Hill, the slope at the northern part and the long spiral beach and white coral reef sand.

* The promotion of scenic beauty

The promotion of scenic beauty is the most important point for planning the beach park and beach promenade. The scenic points consist of two parts. One is the landmark view of Pattaya Hill from the Pattaya beach area. The other is the landscaped area along the beach park and beach promenade.

* The promotion of kinetic space

When the people ride on bicycles along the beach and the beach park or pedestrian pass, it is necessary that they be able to watch and enjoy the well-planned promenade and plantation. A well-controlled promenade and plantation along the beach will heighten the delight and interest of the tourists.

* The promotion of pleasure

The types of pleasure on the beach consist of swimming, sunbathing and other ocean-related activities. The promotion of pleasure is composed of four elements as follows:

- A well-controlled beach in respect of beach privacy
- A variety of physical and special arrangements for the beach activities
- Control of street vendors on the beach
- Mooring of boats, scooters and yachts at the designated locations

2) Beach promenade space

The beach promenade is composed of four components as follows:

- Control of privacy for sunbathing and relaxation on beach.
- Improvement of services on the beach for international tourists.
- Introduction of a new transportation systen from the northern core to the main amenity core.
- Improvement of a new fashion road in a more natural way along the hotel site.

3.6.4 Development Plan

There are two key development plans related to the beach area improvements. The beach promenade and related beach area improvement studies have been carried out in great depth during the feasibility study period and the findings and solutions are described in the road section of Volume 2. Therefore, in this section, this item is not included for further explanation. Hence, the major emphasis is made on the seawater surface control measures and plans.

3.6.5 Water Surface Control Plan

(a) General

Fig. 3.6.1 shows the diagram for controlling the water surface usage pattern. The proposed water surface control plan consist of three component areas.

1) Swimming area

This area needs to be free of swimming and will be open only to swimmers. Other ocean activities like boat riding fishing etc. are prohibited in this area.

2) Slow activity area

Speed restrictions for motor boats and other water vehicles are enforced in this area. Special provisions have to be implemented for smooth control of high speed motor boats and other vehicles.

3) Ocean activity area

No speed limitations on boats are applied in this area, which is open to high-speed pleasure-boat riding, sailing, scooter riding and game fishing.

(b) Main Beach Front

This area requires the most strict control of water surface usage since it is the most important area in the Pattaya beach resort.

Fig. 3.6.1 shows the water surface control zoning plan. The basic idea of this zoning plan is as follows:

- To divide an area for swimming and for boat riding.
- To provide a quiet zone along the landuse plan.
- To establish harmonious use of the surface of the water.

(c) Regulations for Control of Water Surface Usage

Regulations required for enforcement of the zoning plan are proposed as follows:

1) Swimming zone	Prohibition of all vessels
2) Quiet zone	Prohibition of motor boats
3) Slow activity zone	The speed of motor boats is to be less than 40km/h
4) High-speed zone	Offshore from beach
5) Caution zone	Slow-down area for the safety of swimmers
6) Water skiing & parasailing zone	For water skiing and parasailing

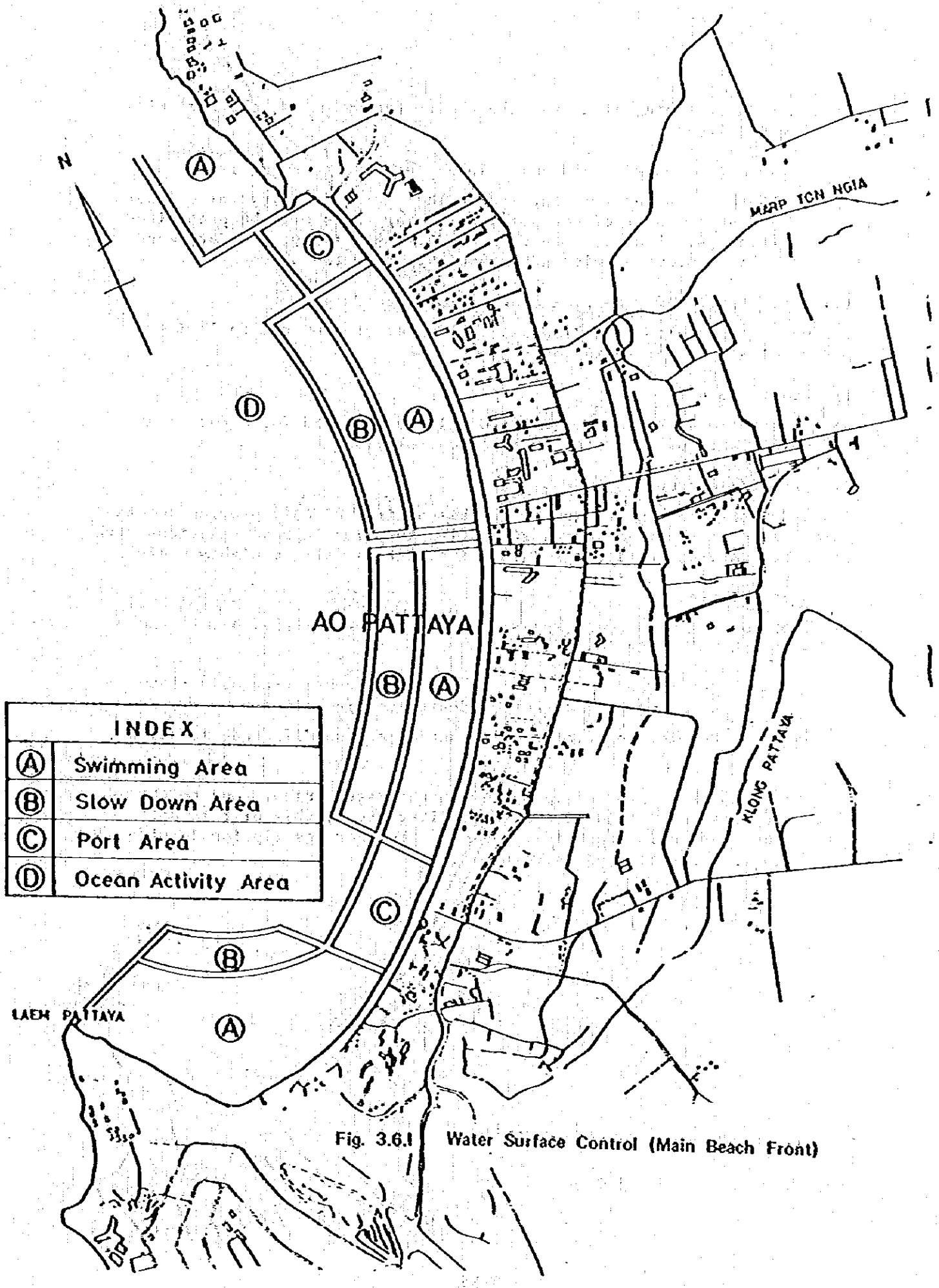


Fig. 3.6.1 Water Surface Control (Main Beach Front)

In addition to zoning plan, for the safety for swimmers, the following will be required:

- No motor boats should come closer than 30m to swimmers.
- In the area for swimming and at the diving facility for swimmers and at the pier of the port, all motor boats will be prohibited from travelling at more than 8km/h. Especially, a safety zone will be provided with a width of 60m from the above area.

(d) Organization for Control of Water Surface Usage

The water surface control plan will be implemented by the following personnel and its organization.

1) Coast guard

An organization like the coast guard will be proposed for enforcement and maintenance of the water surface control plan.

2) Trained instructors

Trained instructors stationed at the beach will not only provide necessary guidance to the users of ocean activities but also improve relations with the public and an institute for such instructors will be highly useful.

(e) Boat Mooring

The boat mooring phasing analysis consists of three steps, as described below and shown by Fig. 3.6.2.

Step-1 Before completion of the piers, concentration of variety of boats at 5 different designated locations.

Step-2 Completion of pier construction at two different locations.

* The northern pier was proposed in the Master Plan. Due to the new data collected in the feasibility study, this pier is not recommended for technical reasons. Further description is made in the pier section in Volume 2.

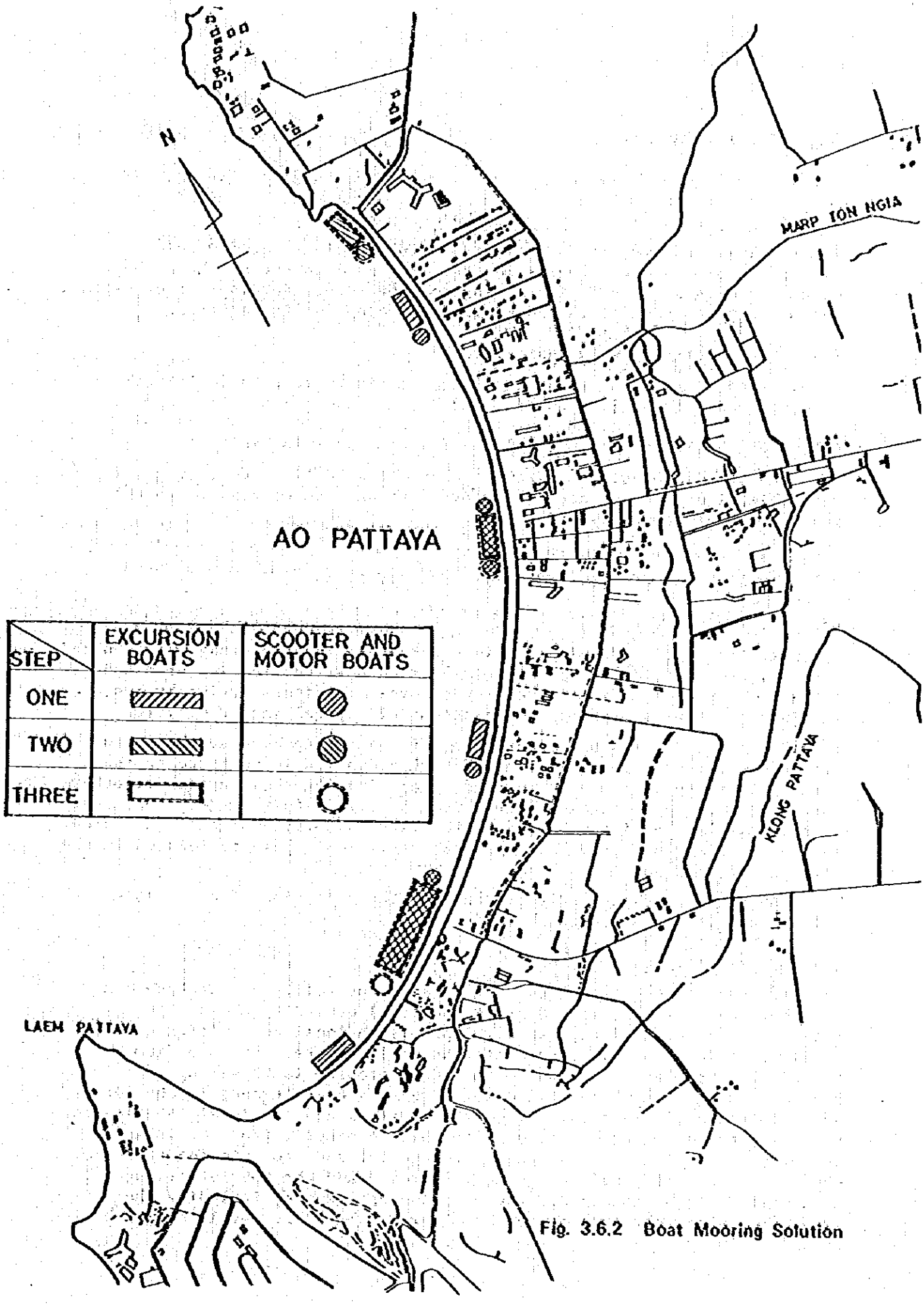


Fig. 3.6.2 Boat Mooring Solution

3.7 Inland Activity Area

3.7.1 Development Policies

(a) As Supplementary Activity to the Ocean Activity

The physical plan for ocean activity is insufficient for diversified professional ocean sports lovers. The need to extend the number of nights of stay is ever increasing for the future development of Pattaya beach, so that adequate inland activity development is required.

(b) Inland Activity with Thai Flavor

In order to develop an attractive inland activity zone, a definite Thai atmosphere has to be introduced there.

(c) Availability to the Local Community and Day-Trip Visitors

From the standpoint of community development as well as tourism development objectives, inland activity facilities have to contribute to the improvement of community life.

3.7.2 Evaluation of a Suitable Inland Activity Zone

(a) Physical Features

Concentrated tourism development is recommended in this study. The inland activity area should be conveniently located near the lodging area and the community area. Since most of the foreign visitors arrive by bus, the inland activity area has to be accessible by walking or bicycle.

From the point of view of conservation of natural resources, the appropriate use for the swamp and land of high elevation is to increase the potential beauty of the area instead of eliminating these areas for other purposes. One way to achieve the above objectives is that development of park-like inland activity should be the first priority for the swamp area, and horse riding and other appropriate activities should be located in the high elevation area.

With the above-mentioned criteria in mind, the selection of a suitable inland activity location can be made.

(b) Social Features

This approach to successful tourism development relies on adequate control between tourist-oriented areas and local community areas. The detrimental effects of tourism developments on local communities can easily be pointed out in other international resorts. It is a firm belief that the best solution to the above problem is to set up some kind of buffer zone which will also serve as a contact zone in the form of an inland activity area between the tourists and the local inhabitants. Moreover, the local community will be able to benefit from the inland activity facilities and its space. The social and economic conditions of the future community will be greatly improved and the tourist-oriented area will be less disturbed. The existing open space, including the swamp area along the back of the hotel area, should be developed as the inland activity area.

3.7.3 Planning Concepts

(a) The establishment of an inland activity corridor to combine various activities

(b) Characterization of the inland activity zone

1) Northern activity zone - Inland sports oriented
2) Central activity zone - Appreciation oriented
3) Southern activity zone - Ocean and inland sports oriented

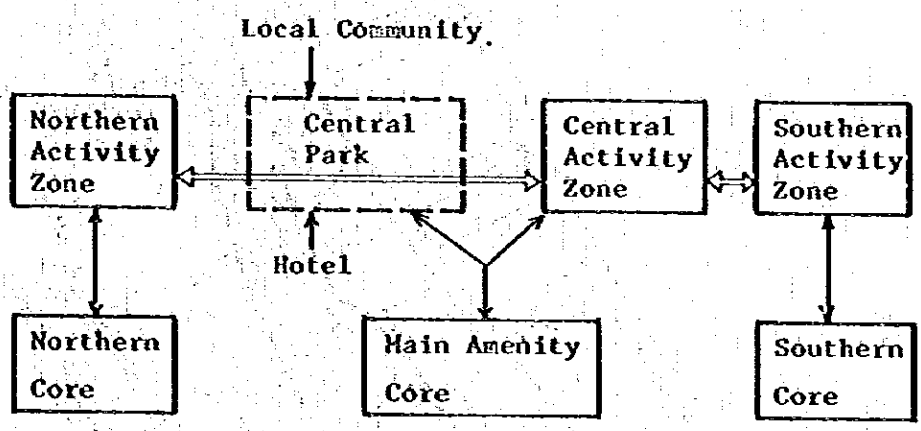
(c) The above mentioned activity zones are connected with park-like natural open spaces. Various resting areas, playgrounds, picnic areas, and fishing areas are inter-connected with pedestrian and bicycle paths which go around swamps and ponds.

(d) Converting the existing swamp area into pond and water surfaces with tropical water flowers and vegetation.

(e) Development of the passage ways for the local people from the residential area to the hotels through the inland activity park zone for the benefit of the local inhabitants.

(f) Appropriate access paths to the inland activity corridor for participants from the hotel area and other areas.

Fig. 3.7.1 Inland Activity Corridor



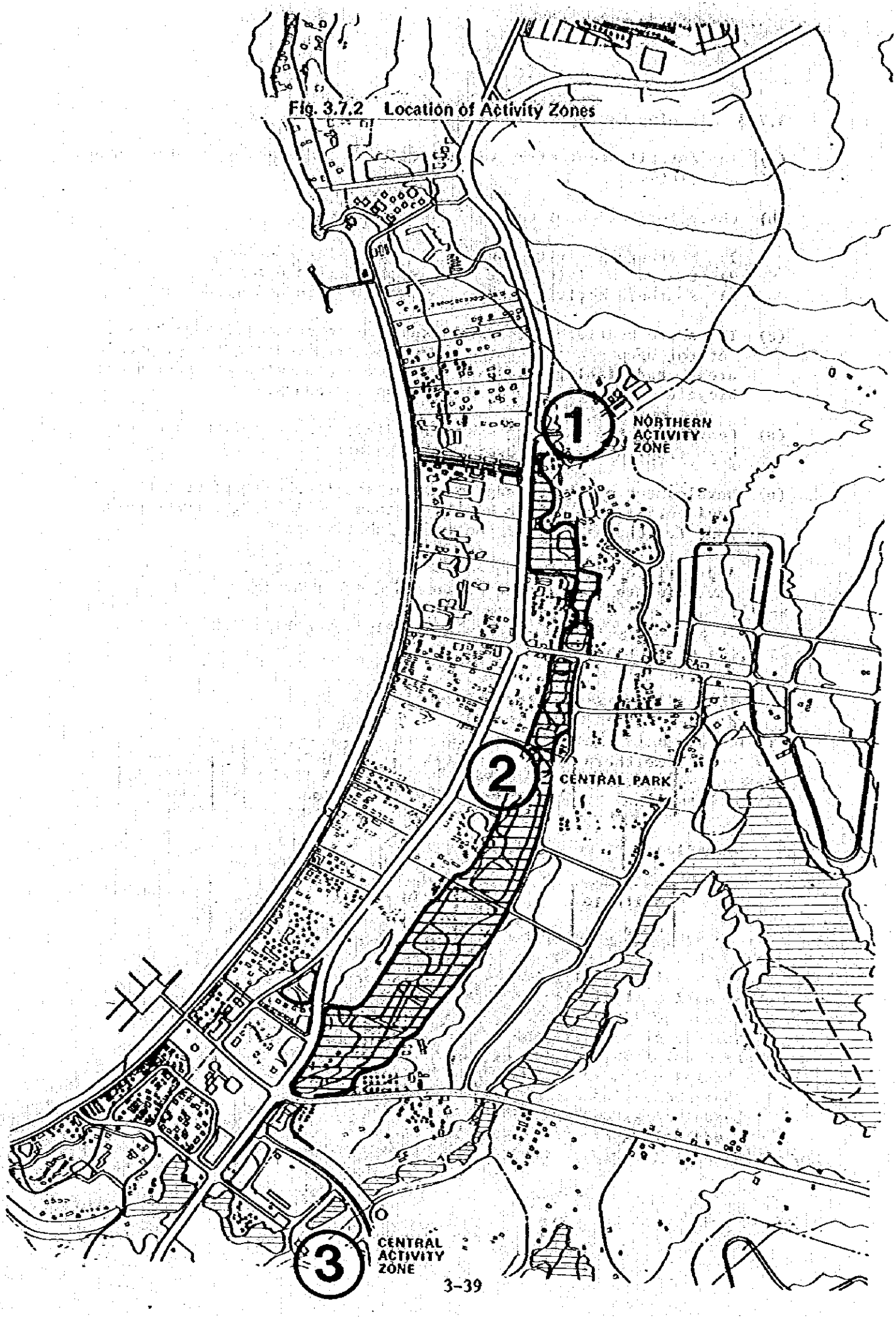


Fig. 3.7.2 Location of Activity Zones

3.7.4 Development Plan

(a) Criteria

1) Easy phasing
2) Economic feasibility
3) Conservation of nature
4) Safety and comfortability
5) Variety of special experiences
6) Easy access
7) Tropical atmosphere
8) Clarification and definition of various activity zone requirements

(b) Summary of Inland Activities

Financial feasibility studies for inland activities other than park zone activities will be suggested before implementation.

Table 3.7.1 List of Inland Activities (Unit: ha.)

	Phase 1
Northern Activity Zone	
Sports zone (B)	10
Natural zone (A)	70
Central Activity Zone (D)	
Orchid garden	4
Elephant-at-work display	4
Animal park	5
Botanical garden	6
Central Park (C)	40
Total	139

(c) Northern Activity Zone

1) Concepts in zoning of activity

There are two main activity zones which are the sports-oriented activity zone and the natural field zone.

a. Sports-oriented activity zone (activity center)

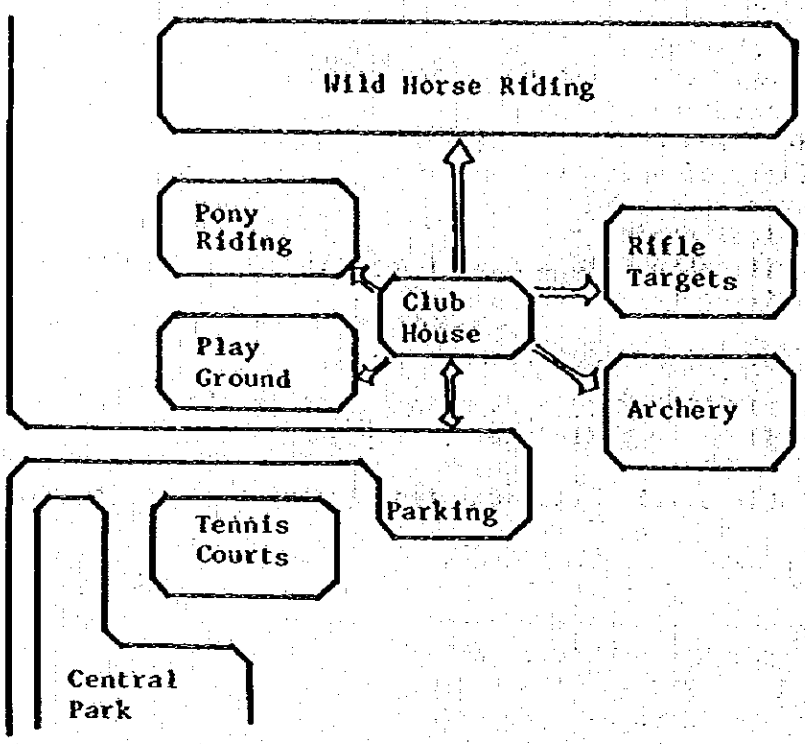
The following activities are recommended in this activity zone: Tennis, pony riding, archery, rifle shooting, etc.

b. Natural field zone

Horse riding areas and cycling courses are provided here according to the natural contours of the land.

The functional relationship of the above-mentioned activities are shown in Fig. 3.7.3.

Fig. 3.7.3 Functional Relationship of Northern Activity



(d) Central Activity Zone

The following activities are considered for the central activity zone.

1) Orchid garden

Orchids are not only displayed, but may also be sold to visitors to the site, so that it will not only serve as a tourist attraction but will be self-sustaining as a local industry.

2) Elephant-at-work display

Field work by elephants will be shown in the elephant park.

3) Animal park

Tropical animals such as reptiles are displayed in natural settings with a Thai atmosphere.

4) Botanical garden

The emphasis here would be on the collection of tropical plants.

5) Natural park

The function of the park will be for the appreciation of natural forests by pedestrians and bicycle riders. This will also become a reserved area for future expansion for other activities.

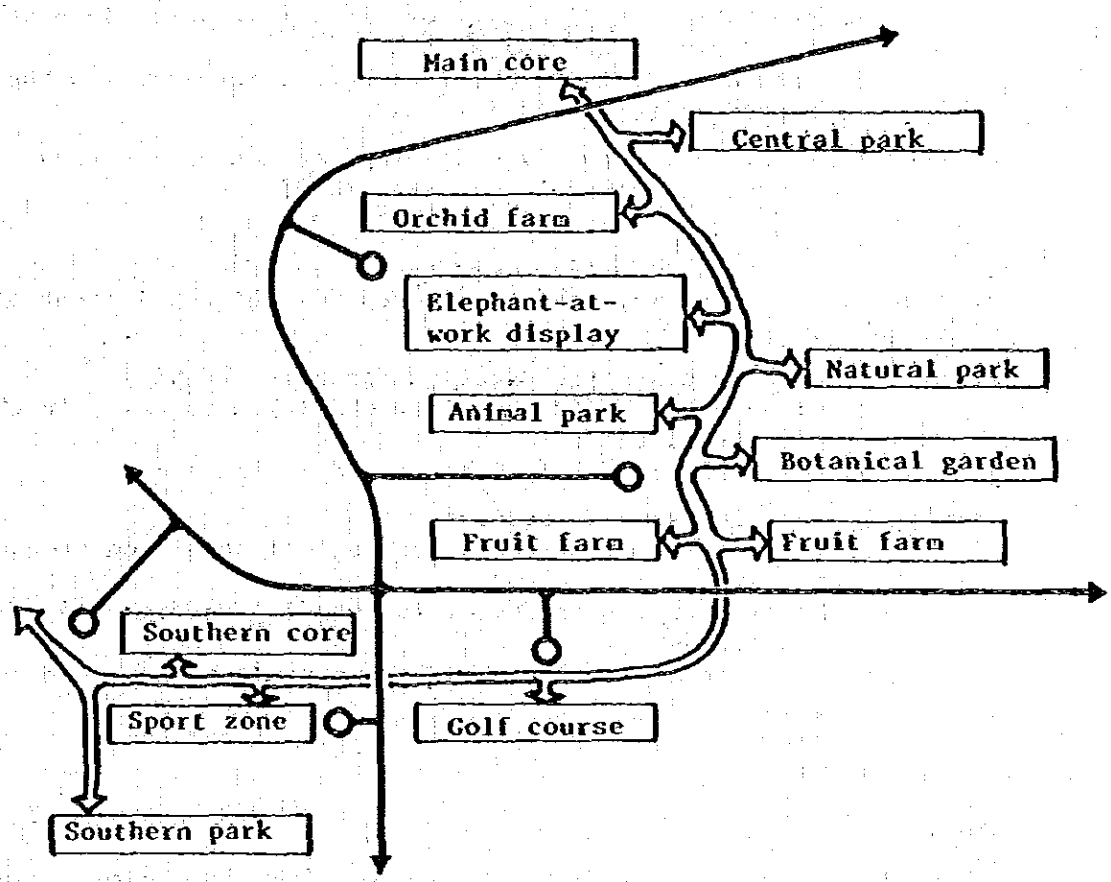
6) Fruit farm

Thai-cultivated special fruits are displayed and may be sold to the visitors. The products from the farm may be supplied to the hotels and restaurants in Pattaya.

7) Racing circuit

Improvement of the existing facilities should be done for more effective use as tourist facilities.

Fig. 3.7.4 Functional Relationship of Activities in the Central and Southern Activity Zone



(e) Central Park-zone

1) Concepts for the usage of the central park

The inland area behind the existing accommodation zone contains continuous swamps and ponds. For drainage of storm water, adequate storm water channels have to be provided. Overall development of the park including pedestrian ways, bicycle paths and resting facilities along the ponds, swamps and channels with water flowers and vegetation should be promoted to be used by the visitors and local inhabitants alike.

2) Alternative solutions for the central park

There are four possible solutions for improving the existing open space for the inland activity park zone.

Solution "A"

Improving the existing swamp area, while retaining the natural swamp and pond with tropical flowers and vegetation.

Merits
1. The most economical solution
2. Conservation of natural conditions
3. The best effect aesthetically
4. Creation of the best scenery walkway and pedestrian path
5. Advantageous to the natural cleaning process of waste water from the hotel area
6. Acts as a reservoir for storm water drainage
7. Prevention of discharge of dirty rain water into the sea during heavy rains
8. Acts as a definite physical buffer zone between the hotel and residential areas

Demerits
1. Requires careful site development and engineering studies to control the water level

Solution "B"

Introducing sea water into the swamp area for the development of inland lakes.

Merits
1. Dynamic aesthetic creation for park activity
2. Clean water would flow into the lakes to maintain the quality of the water
3. Possibility of inland beach and marina areas

Demerits
1. Vast investment required
2. Possibility of affecting ecological condition around the area
3. Possibility of affecting surrounding underground water conditions
4. Requires a delicate engineering study to keep the sea water clean
5. Large-scale demolition of existing local houses necessary

Solution "C"

Filling in the swamp area to create a park with storm water channels.

Merits
1. Produces more open space for actual activity facilities
2. Simple feasible solution taking care of the storm water problem

Demerits
1. Less attractive and monotonous activity park zone
2. Requires rather large-scale investments
3. Existence of unattractive channels
4. Less possitive solution as a buffer zone
5. Problem of dirty storm water flowing into the sea during heavy rains

Solution "D"

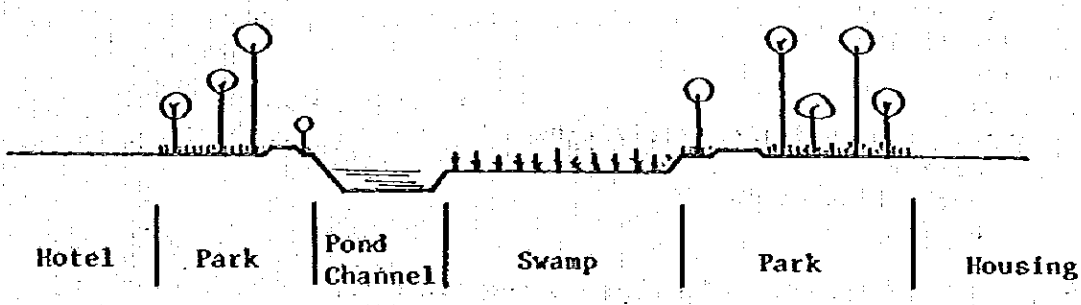
Using the existing open swamp area to make a park zone with minimum improvements.

Merits
1. Less investment required
   Less disturbance of ecological conditions

Demerits
1. Existing swamp requires some improvement for park zone activity
2. Rather limited aesthetic improvement for the activities
3. Requirement of engineering solution to the problem of storm water drainage
4. Less variety in the promotion of activities

After careful consideration, it is recommended that solution "A" is the most desirable alternative.

Fig. 3.7.5 Section of Central Park



3.8 Islands

3.8.1 Development Policy

(a) Ko Lan Island

1) Emphasis on natural beauty

- White coral sand
- Coral reef
- Scenery of the island

2) Promotion of activities

- Ocean activities
- Swimming
- Day camping
- Sightseeing
- Fishing
- Diving
- Supplementary inland activities
  - Hiking
  - Sunbathing camps
  - Golfing

3) Man-made facilities to be kept to the minimum

(b) Ko Phai Island

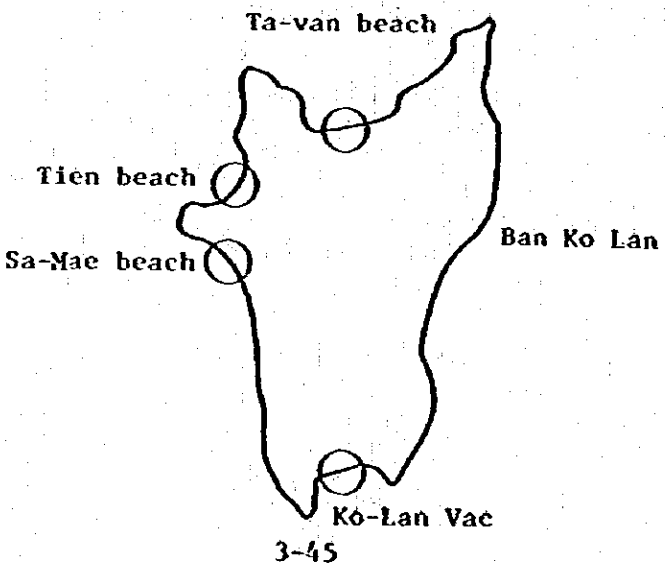
Emphasis on natural conservation, limiting facilities only to camping or other casual activities.

3.8.2 Development Concept for Ko Lan Island

(a) Background

As shown in Fig. 3.8.1 the island has four small beaches along the coast and a 200m high mountain in the middle. The overall effect of the beaches and the mountains is to demonstrate the beautiful nature of the island. The permanent local population in 1976 was about 1,420 people and almost all of them live in the fishing village of Ban Ko Lan.

Fib. 3.8.1 Beach Location of Ko Lan



Ko-Lan Vac beach located at the southernmost part of the island has been developed by a private investor and its future development plans for the property have been prepared which include a 250-room hotel and various other facilities and activities. As long as the proposed facilities are on an adequate scale and in line with the principles of the development policy, the Ko Lan Vac proposal should be implemented as a part of the development of the island. However, the proposal of sea aquarium facilities should be discouraged to avoid duplication of similar facilities on the mainland.

(b) Development concepts

1) Promotion of tranquil beaches

The essential usage of the beaches is aimed at day camping, and service facilities are recommended to be of a minimum scale. Accommodation facilities are provided only at the Ko Lan Vac development area and other service facilities are located in the manner based on the planning principles shown in the illustration.

Transportation facility	- Pier
Beach facilities	- Locker rooms Changing rooms Shower rooms Toilets
Safety facilities	- Police box First aid station
Amenity facilities	- Shops Restaurants

A cluster of service facilities is provided in the area close to the pier to allow unified service development and to reserve the tranquil beach space for day campers. The service center is planned to be located between Sa Nae beach and Tien beach would be utilized by visitors on both beaches, which make it possible for both beaches to be used all year round. Ko Lan Vac beach services are privately provided by the developer.

2) Safety measures

Similar zoning control regulations will be enforced on the beaches on Ko Lan Island for the safety of visitors and to maintain a comfortable beach activity area.

3) Provision of inland strolling routes

Establishment of a strolling network as an extension of day camping activities will add attraction to the beach activities. Strolling routes and view terraces should be strategically selected to appreciate the natural beauty of surrounding resources.

4) Provision of a transportation system

Access by ferry boats to mainland Pattaya should be improved and unnecessary expansion of the mooring area by ever-increasing uncontrolled boats should be avoided by means of the pier and regulations.

5) Ban Ko Lan as a service town

Until now, Ban Ko Lan village has been growing as a fishing village. However, taking into consideration the trend toward the movement of the tourism-related population to this village, service functions for the tourism industry will be added to the fishery functions of the village.

3.8.3 Scale of Beach Service Facilities

(a) Projection of the Volume of Visitors to Ko Lan Island

In order to determine the distribution of visitors to the three beaches in Ko Lan, the following seasonal usage pattern of the beaches was defined.

Period used	Beach
March to September (wet season)	- Ta Van beach - Tien beach - Ko Lan Vac beach
October to February (dry season)	- Sa Mae beach - Ko Lan Vac beach

Estimation of total visitors to Ko Lan Island

	1981	1986	1996
Arrivals/day	1,600	2,000	2,900

Distribution of the visitors to the 3 beaches has been made considering the density of the beaches.

From March to September

	1981	1986	1996
Ta Van beach	900	1,120	1,630
Tien beach	380	480	690
Ko Lan beach	320	400	570
Total	1,600	2,000	2,900

From October to February

	1981	1986	1996
Sa Mae beach	1,260	1,570	2,280
Ko Lan Vac beach	340	430	620
Total	1,600	2,000	2,900

The total number of visitors at the three beaches is well under control from the point of view of beach density criteria, which is 15 m^2/person on average days and 10 m^2/person on peak days.

(b) Summary of service facility scale.

Taking into consideration the number of visitors, occupancy rate, rotation rate and proper unit area requirements, the various facility scales are determined and summarized as follows:

Summary of service areas

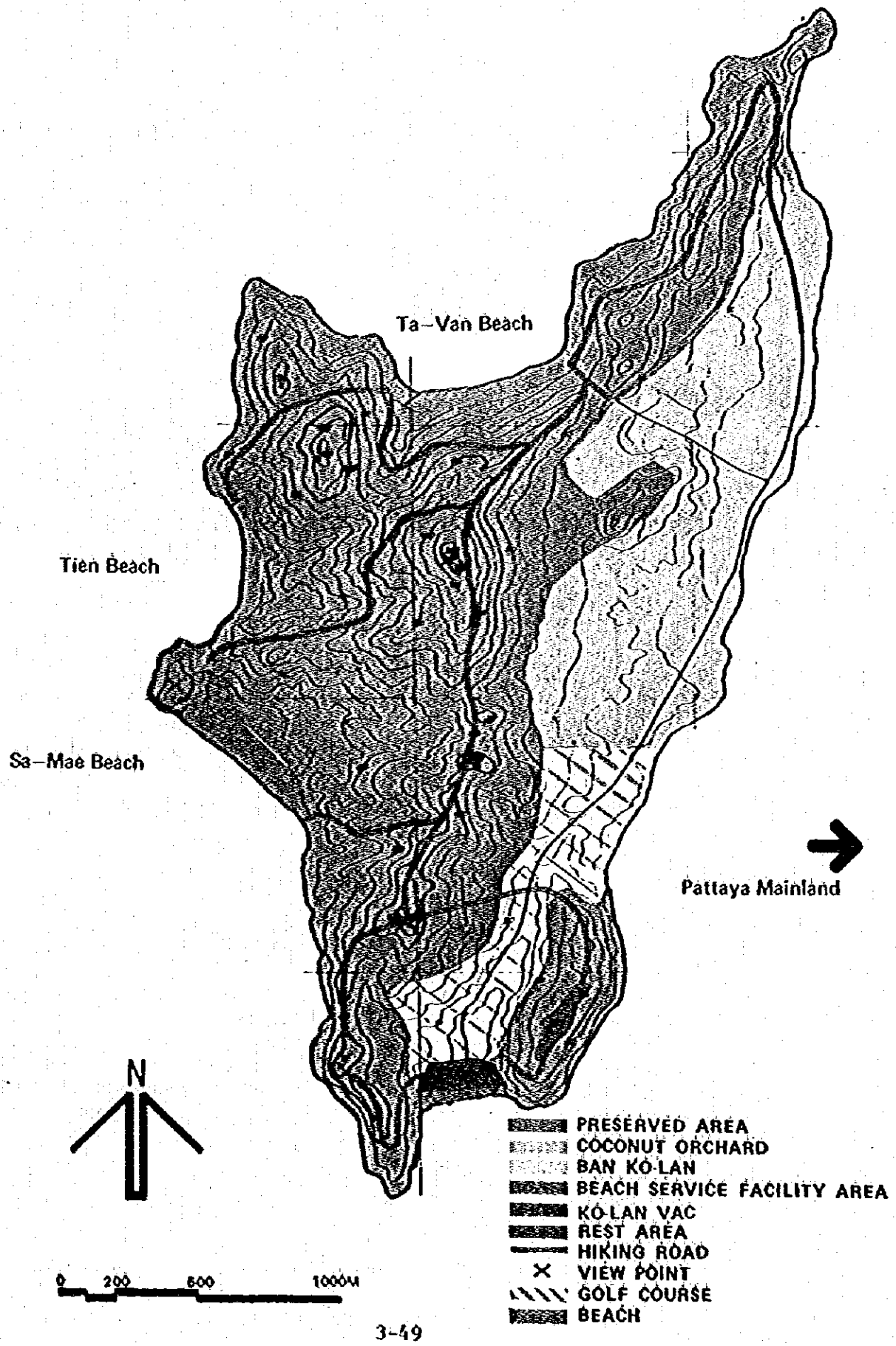
Sa Mae beach service area

	Area in m^2		
Facilities	1981	1986	1996
- Shops & restaurants	1,280	1,610	2,310
- Police & first aid station	30	30	30
- Bath house	348	426	620
Total building area	1,653	2,066	2,960
Total land area	4,100	5,200	7,400

Ta Van beach service area

Facilities	1981	1986	1996
- Shops & restaurants	900	1,130	1,620
- Police and first aid station	30	30	30
- Bath house	246	306	444
Total building area	1,176	1,466	2,094
Total land area	2,900	3,700	5,200

Fig. 3-8-2 Development Plan for Ko-Lan (Master Plan)



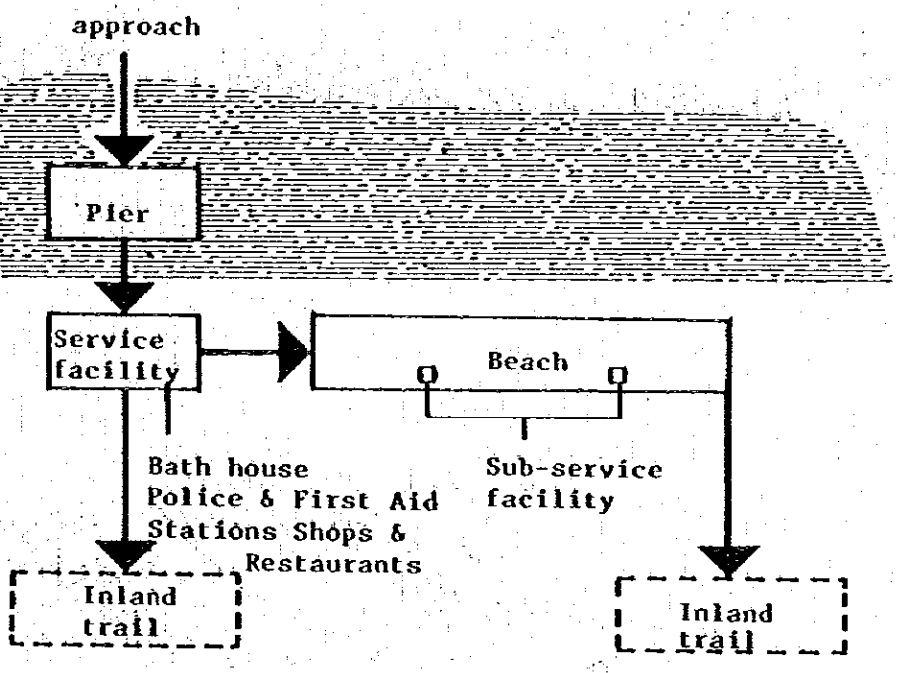
3.8.4 Development Plan

(a) Improvement Plan for the Beach Area

1) Design principles for the pier and service facilities

Service facilities should be clustered around the pier to conserve open beach and day camping areas. Observing the existing conditions of service facilities which occupy the whole space behind the beach, it is considered necessary to rearrange the service facilities and to lease the open space for day camping activities instead of narrowing the limited beach area. The cluster solution is considered superior to the set back solution for the facilities. The concepts are shown as follows:

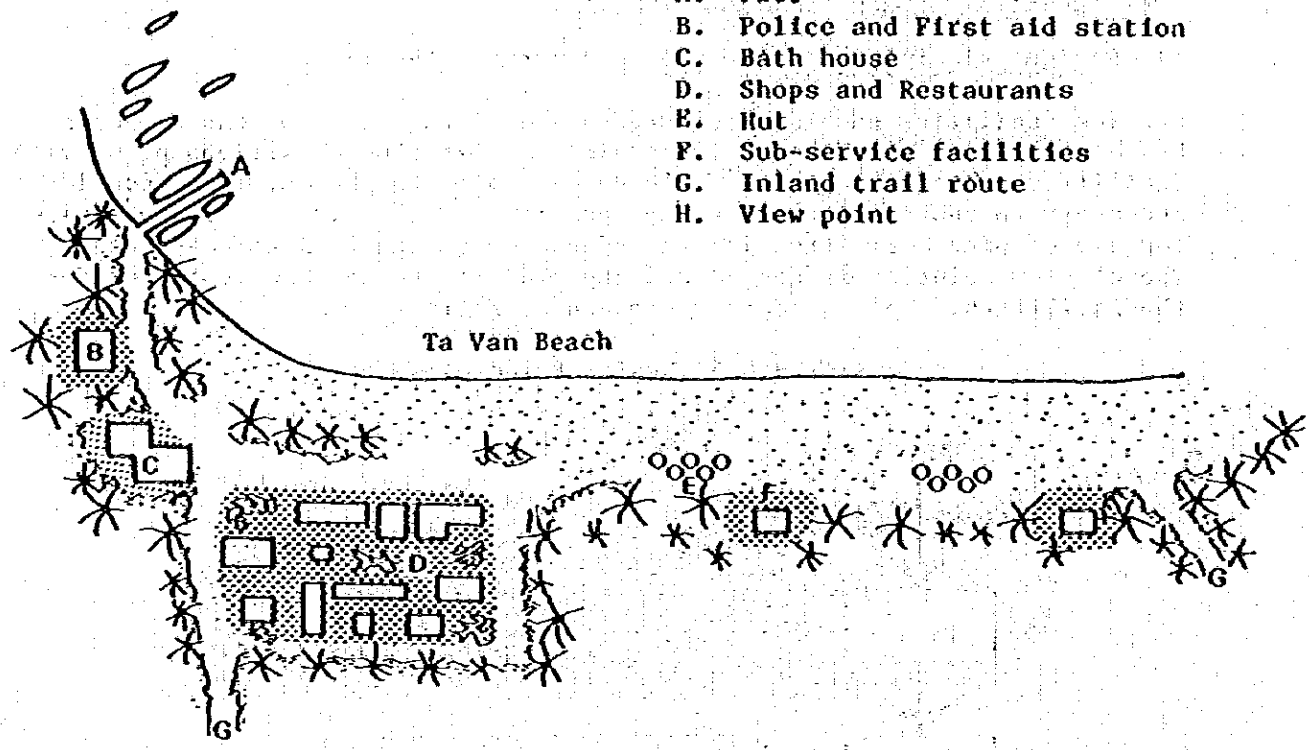
Fig. 3.8.3 Design Principles

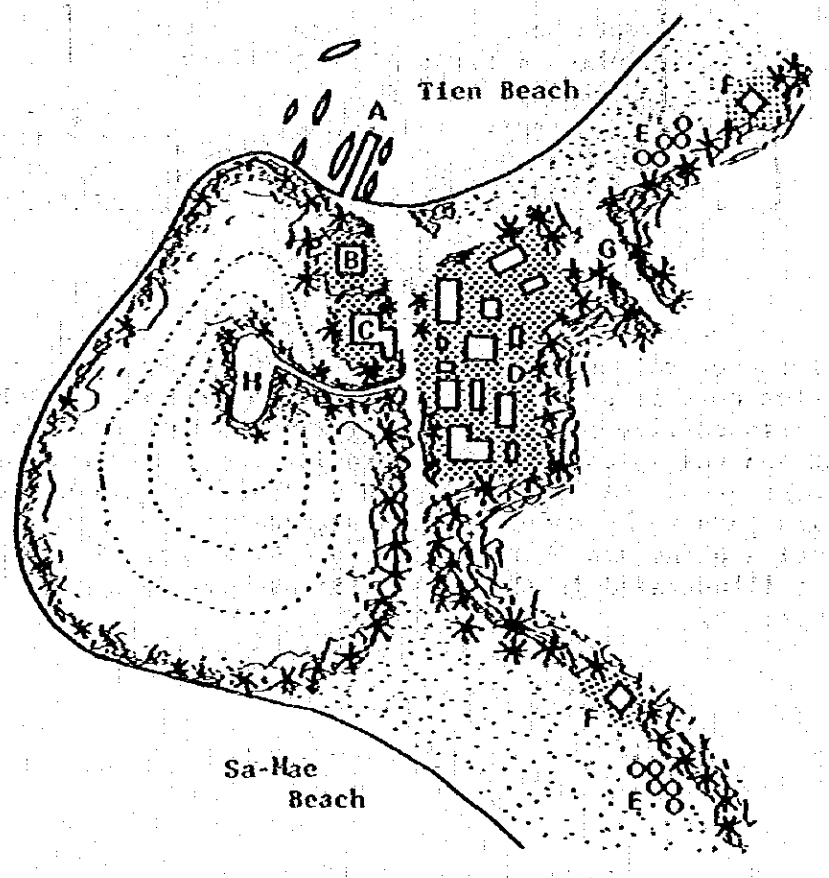


In order to control unnecessary development of service facilities, only one service core is provided at the area between Tien beach and Sa Nae beach. This service core will be catering to both beaches. A park-like shopping and restaurant area will provide the best atmosphere in this development area. Careful site plan analyses of various service facilities have to be made in the design development stage. Tentative illustration plans are shown in Fig. 3.8.4, and preliminary service park plans are illustrated in the feasibility study, Volume 2, "Road and Street System".

Fig. 3.8.4 Illustration of the Beaches

A. Pier
B. Police and First aid station
C. Bath house
D. Shops and Restaurants
E. Hut
F. Sub-service facilities
G. Inland trail route
H. View point





2) Zoning of the water surface

Zoning control regulations will provide six zones as follows: Swimming zone, quiet zone, slow activity areas, high speed zone, caution zone and water skiing zone, the definitions being the same as that for the mainland Pattaya beach. The physical application of the zoning is shown in Fig. 3.8.5.

3) Police box and first aid stations

It is of great importance to guarantee the visitors' safety in order to maintain international standards of the resort. Police and first aid stations should be located at each beach. Police services will be carried out by field inspection. Regarding the first aid services, coordinated plans to deal with serious injuries have to be established in advance, such as relaying patients to Ban Ko Lan or a polyclinic and hospital on the mainland.

(b) Development Concepts for Inland Activity

Major developments of inland activity have been carried out by Ko Lan Vac. Future expansion of inland activity will be studied for their concurrence with the development concepts. The following facilities utilizing the natural mountainous area shall be provided. They are, a picnic area, a sun-bath camp, a cable car, mountain-top restaurants, and other strolling routes connecting beach areas and mountain tops leading to viewing terraces.

(c) Ban Ko Lan Development

1) Projected population of Ban Ko Lan

The estimated existing population on Ko Lan Island is about 1,420 persons, of which 1,200 persons are related to the local industry and the remaining 220 are related to the tourism industry. In the future, tourism-related population will increase as the number of visitors to Ko Lan grows, assuming 20% of visitors will spend an average of 80 bahts for lunch and shopping, and 20 bahts for inland activities. The number of employees in the tourism industry will be as follows:

	1981	1986	1996
Shops and restaurants	260	340	480
Other facilities	60	90	110
Hotel employees	120*	380**	380
	440	810	970

* 78 units x 1.5 person/unit
** 250 rooms x 1.5 person/room

Total population of tourism-related industry based on an employment ratio of 50% will be as follows:

	1981	1986	1996
Population	880	1,620	1,940

Assuming that the scale of existing local industry is maintained as it is, the total population of the island will be as follows:

	1981	1986	1996
Population	2,080	2,820	3,140

The above projection includes an assumed 300 persons for service staff for the hotel, who are provided with housing facilities by Ko Lan Vac. in the second phase of development. The adjusted population of Ban Ko Lan, excluding the 300, will be as follows:

	1981	1986	1996
Population	2,080	2,520	2,840

2) Provision of Ban Ko Lan facilities

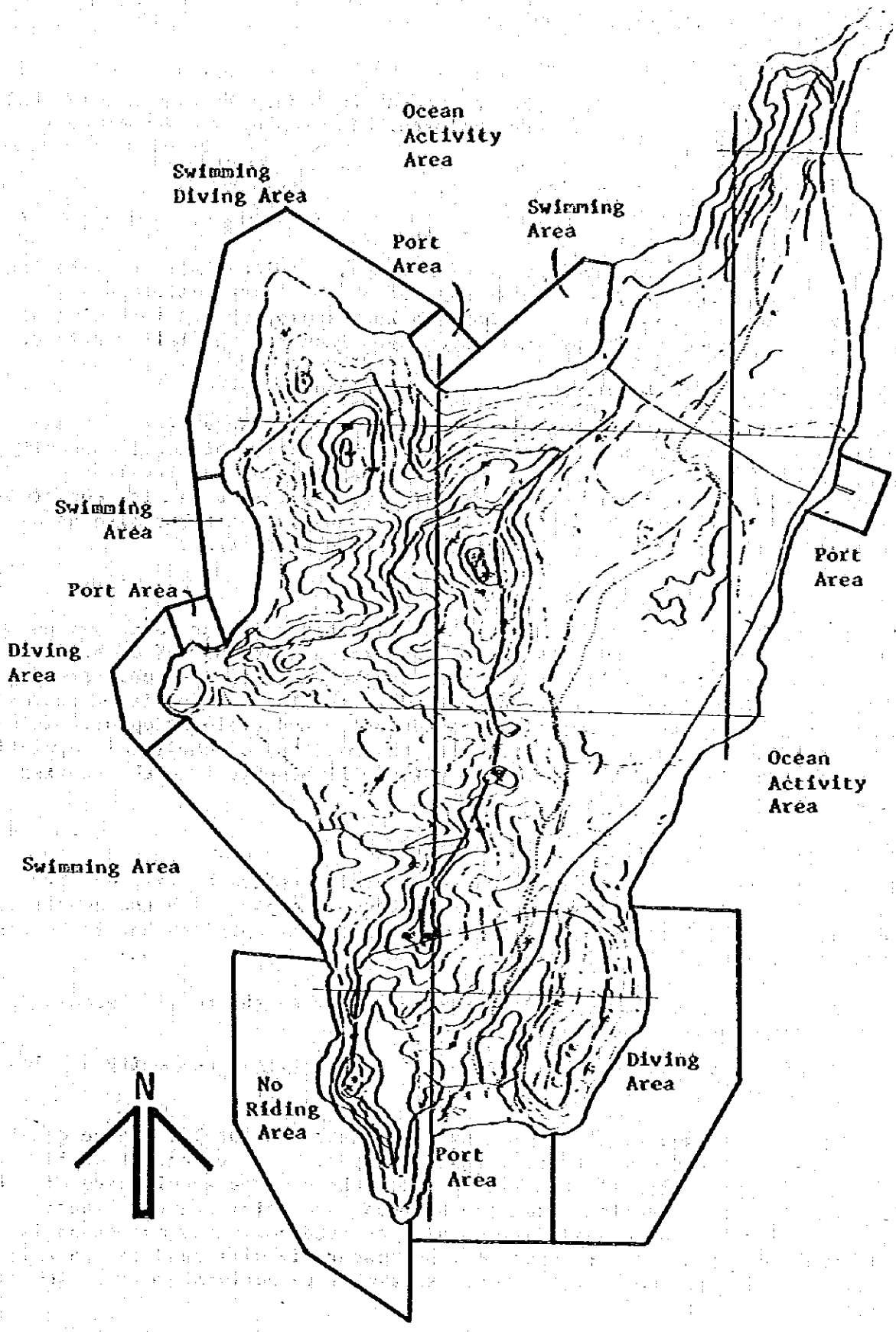
a. Small-scale service town development around the existing village.

Recommended gross density: 150 persons/ha

b. Service facilities and infrastructure service provision will be kept to the minimum.

- provision of infrastructure
- a primary school
- a polyclinic
- a town hall
- other service facilities

Fig. 3.8.5 Zoning of the Water Surface



3.9 Residential Area

3.9.1 Forecast of Future Population

(a) Tourism Industry and the Local Community

There are at present about 42,500 permanent residents living in this study area. 40% of the population are employed. The employment structure is summarized as follows:

Agriculture and fisheries	11.2%
Production processes	1.7%
Services	87.1%

Considering the future development of Pattaya, service functions will increase in importance. From the standpoint of local area development, Pattaya tourism development will have to keep improving the following relationships in order to produce advantages from the multiplier effect.

1) Relationship to local commercial enterprises

As the number of tourist arrivals increases, tourist service functions will be accelerated. Simultaneously, the potentiality of local community service functions will be raised and developed into a high level of economic structural development. Especially, the future Na Klua commercial center will function not only as a local community center, but also as a central commercial center for the whole tourism study area.

2) Absorption of the labour force

As tourism development progresses, the demand for a labour force and employment opportunities will increase. At present, around 80% of hotel employees are brought into Pattaya from Bangkok. It is also understood that good, trained labour is hard to find in the local community. Therefore, it is necessary to provide good education and training opportunities for the local population. As a result, the mobility of the local population will be stabilized and the local community will benefit from the tourism development.

3) Redevelopment of the local community

Since the economic base of the local communities relies heavily on the tourism industry, in order to prevent failure in coping with the population increase by social development, a new town planning approach has to be taken with the following two objectives:

1. Avoiding confusion and disturbance between the tourism area and the local community area.
2. Providing comfortable, well-planned functional community development.

It is planned to locate the community towns near the hotels. These communities have their own service cores to support their essential daily needs and supply cultural stimulation. But these cores should have clearly defined different functions from the Na Klua commercial center. These community development considerations will promote community awareness in spiritual and economic participation, and naturally will lead the Pattaya tourism development to become a more exciting international resort with a local atmosphere.

(b) Estimates of the Future Population

The estimation process regarding the hotel-related service population is based on a frame work flow chart as shown in Fig. 3.9.1.

1) There are 1,900 farmers and fishermen in the study area at present. Taking into consideration the future development of a sophisticated economic structure, the local industry population will gradually be absorbed in large part and it is assumed that the agricultural and fishery population will be reduced to 1,000 by the year 1996.

2) Regarding the production processes, there are 300 persons employed in the tapioca factories. Considering the detrimental effects of this industry on the tourism development of Pattaya, it is preferred that none will remain employed in the production industry in the surroundings of the study area by 1996.

The framework of the future local community population is expected to be as shown in Table 3.9.1

Fig. 3.9.1 Frame Work Flow Chart

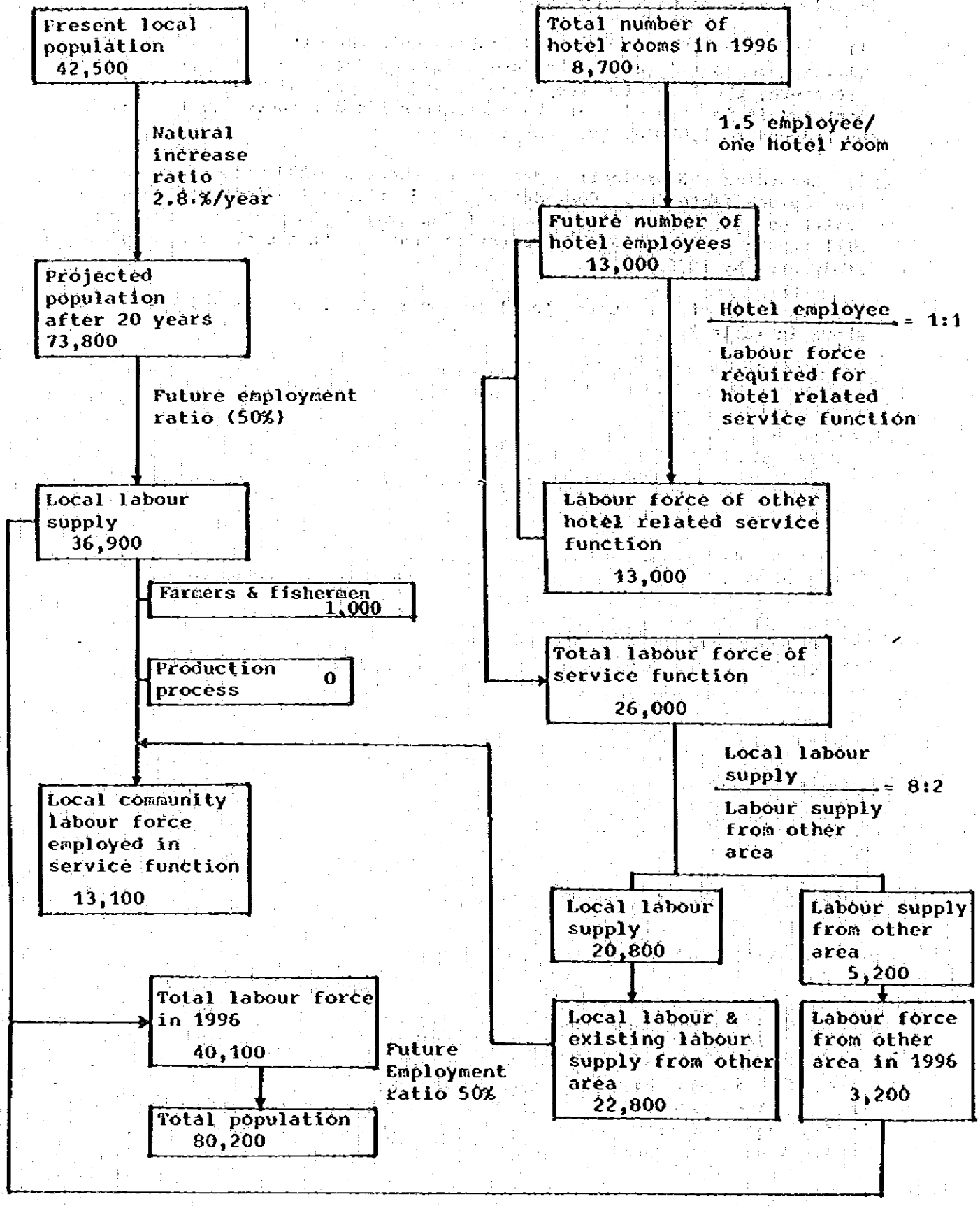


Table 3.9.1 Future population for local community

Items	1976	1986	1996
Total population (persons)	42,500	58,100	80,200
Total employed population	17,000	26,100	40,100
Farmers & fishermen	1,900	1,500	1,000
Production process workers	300	300	0
Service workers for local community	14,800	11,300	13,100
Service workers for tourists		13,000	26,000

Note: The employment ratio for 1986 is assumed to be 45% and that for 1996 to be 50%.

3.9.2 Development Concepts for the Residential Area

(a) Development Policy

The following are the main policies related to the development of the selected residential area in the process of the tourism development of Pattaya resort.

1) Separation of international tourist complex and local residential area

The activity park zone and green belt zone shall serve to maintain both a high quality of local community life and tourist-oriented activities. These buffer zones will also serve as the contact zone for mutual communications between the tourists and the community.

2) Improvement of living environment

To eliminate the future expected disparity in the living standards between the Pattaya beach hotel area and the community residential area, improvement of the living environment should be stressed. For example, community core development with a well-planned school system, a recreational park, public services and other improvements will be provided.

3) Conservation of natural beauty

The existing vegetation, swamp, ponds, rice fields and other natural resources will be conserved or utilized as tourist assets. In undertaking the designing of road networks and the sub-division of lots, a careful approach should be taken to avoid unnecessary destruction of natural amenities.

4) Less disturbance on the existing property line

In order to reduce friction during the development stage, the existing road network, which is closely related to established property divisions, is to be respected unless the road network system does not function properly as part of the overall traffic system.

5) Suppression of social mobilization of the population

The expected population inflow will exert a great impact on the economic, social and physical order of the villages. Therefore, suppression of disorderly migration of the population will be a key factor to ensure the orderly implementation of the masterplan.

6) Variety of housing types and low density appearance of the housing area

As a part of the tourism complex, the appearance of the residential area is a matter of concern. The harmonious mixture of various housing types to meet future demand will be a great asset. The low density traditional Thai appearance of the housing area will strengthen the image of the rural character of the Pattaya beach resort.

(b) Evaluation of Residential Locations

Various locations for residential areas to meet the future demand coming from the population increase have been studied. As shown on the drawing, there are 9 possible alternative locations in the study area, judging from the existing housing distribution and development by the private sector.

The following 3 sectors have been established for housing areas and they are evaluated as follows:

a. Na Klua sector:

Area (1) is an appropriate expansion area to absorb the population increase of Na Klua village. Area (2) is recommended to be kept to the minimum population level to assist the healthy development of the northern new town. For the same reason, area (3) should not be considered as a development site.

b. Northern sector:

There are four possible areas in this section. Areas (5) and (6) are located most conveniently to the place of work. However, they are located contrary to the concept of separation of the tourist-related facilities and the residential area. Both areas also have limited capacity for future expansion. Area (7) also conflicts with the planning concept of separation of the community entrance road and the tourist entrance road.

Area (4) has the most potential possibility for a new town development based upon the following merits.

a) Central location in relation to the hotel area

b) Available land for future expansion

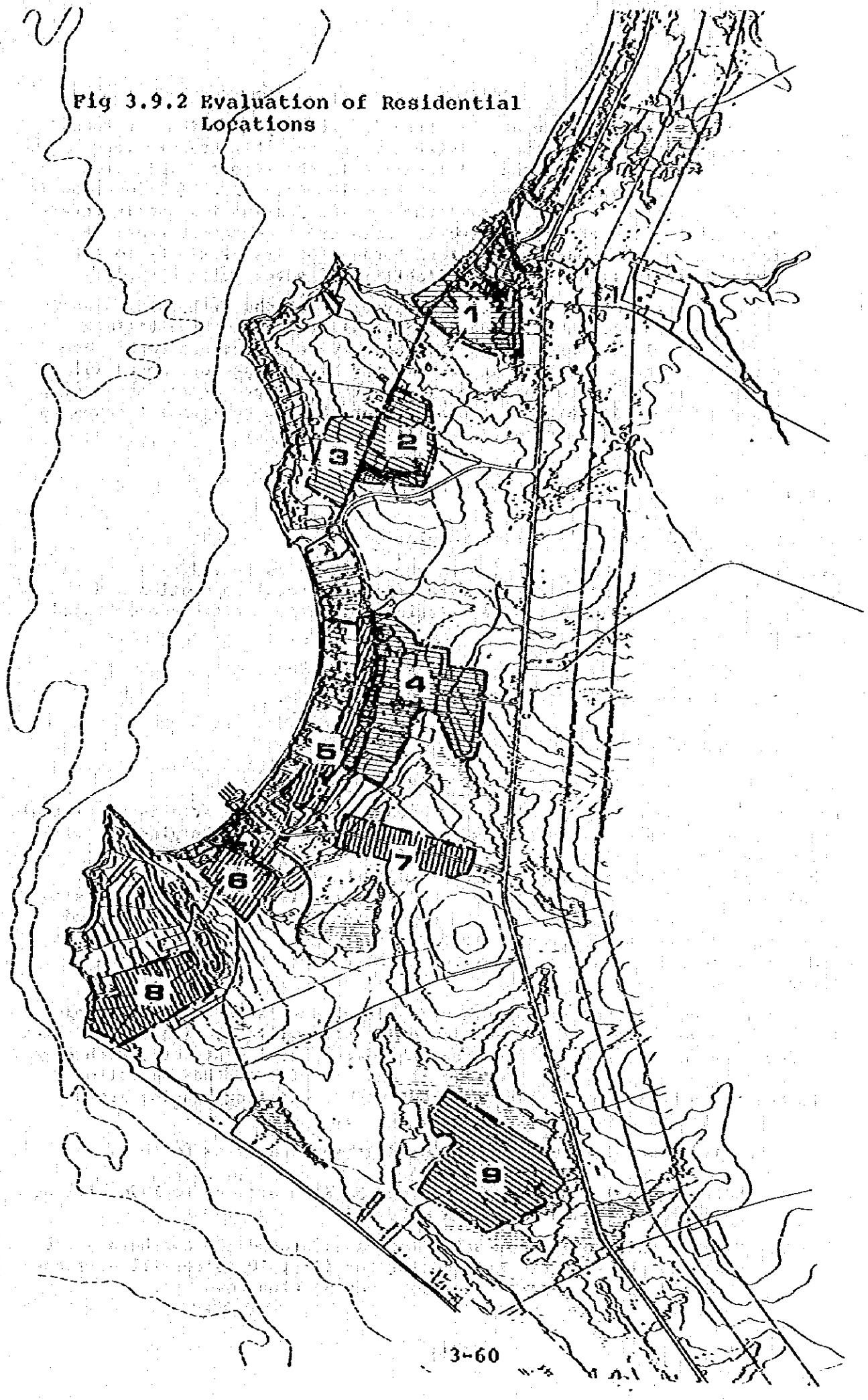
c) Strategic location to the inland activity park zone

d) Efficient infrastructure investment because a highly clustered residential area is already existing.

c. Southern sector:

There are two possible alternative areas. Area (8) is located near the hotel area for convenience to the working destination.

Fig 3.9.2 Evaluation of Residential Locations



However, the land value of this area is probably too high for local residential development. The visual impact of this area is very crucial because of its central location in the resort. This area should be reserved for second-house development. Area (8) location is advantageous for easy access to the working destination but it interrupts the inland activity network. Area (9) is the most feasible location for the southern new town because of its proximity to the working destination and the availability of adequate open space.

Summing up the above evaluation study of locations of housing areas, the expansion of the existing residential area in Na Klua village and the developing of area (2) by the private sector are recommended for the new town development area in the Na Klua sector. Area (4) in the northern sector and area (9) in the southern sector are proposed as the most suitable locations for the new residential towns to to serve the tourism-related facility area.

3.9.3 Planning Framework

(a) Distribution of the Existing Population

The distribution of the population in the study is estimated as shown in Fig. 3.9.3. The numbers are calculated from the total population and the number of houses on the map. The existing population of the concentrated housing area is as follows:

Na Klua	7,700 persons
Hotel area and downtown	8,000 persons

(b) Planning Framework

1) Distribution concepts of future population

How to absorb the future population increase in the study area is a critical item which must be studied and examined. The outcome of the planning will influence the environmental conditions of the tourist area, affecting public investment in the infrastructure and the level of welfare of the local community and convenience to working destinations. Attention has to be paid to the location factors, the population distribution pattern and existing housing distribution characteristics. Recommendations have been made based on the overall examination of these factors and evaluation of their outcome.

Basically there are two areas for housing developments to absorb the population increase. One is the expansion of Na Klua village. The other is the service town developments in the area behind the hotel district. With regard to the dispersed population, the removal and transfer of the population into new towns would not be enforced, but rather existing housing areas should be maintained with their present status.

The basic direction of future population distribution is as follows:

1. Natural population increase in the Na Klua area up to 1996 will be absorbed by the Na Klua town "A".
2. Natural and social population increases around the northern hotel area and the southern area during the first 10 years will be accommodated in the northern new town and Na Klua town "B".

3. Natural and social population increases in the southern development area during 1987 to 1996 will be absorbed by the southern new town.

4. Half of the natural population increase in the northern hotel area during 1987 to 1996 will be absorbed by the northern new town and the other half by the southern new town.

2) Population projection

The summary of the population projections for each new town, based on the results of the distribution study of the projected population is shown on tables 3.9.2 and fig. 3.9.3.

Additional detail study is made in the feasibility study to determine the road network system in the residential area. Hence, some figures have been revised according to the new study as shown in the table 2.5.4, Road and Street system of Volume 2.

Table 3.9.2 Population projection

Year	Total	Na Klua Town A	Na Klua Town B	Northern New Town	Southern New Town	Other
1976	42,500	7,700	0	2,400	400	32,000
1981	48,800	10,300	2,500	3,600	400	32,000
1986	58,100	13,300	5,000	7,400	400	32,000
1996	80,200	20,600	5,000	12,000	10,600	32,000

3) Necessary area of residential area

a. Approx. density

	New Towns	Na Klua Town A
Gross density	100 per/ha.	120 per/ha.
Net density	150 per/ha.	200 per/ha.

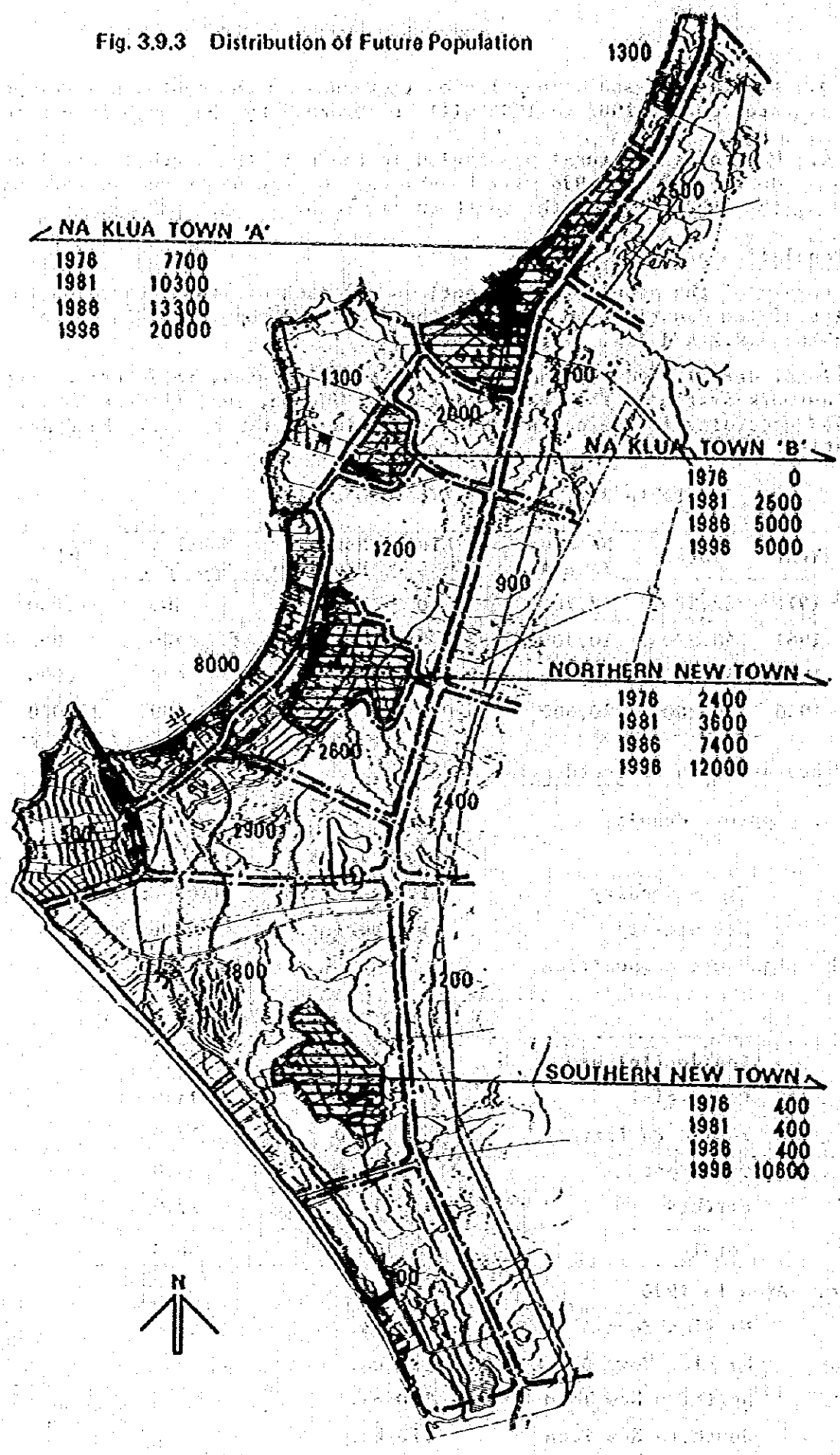
b. Land use composition

	New Towns	Na Klua Town A
Residential areas	65.0	46.0
Commercial	3.0	11.0
Public Facilities	7.0	17.0
Open Spaces	8.0	9.0
Streets	17.0	17.0
Total	100.0%	100.0%

c. Area in 1996

Na Klua Town A	180 ha.
Na Klua Town B	50 ha.
Northern New Town	120 ha.
Southern New Town	110 ha.

Fig. 3.9.3 Distribution of Future Population



3.9.4 Planning Concepts

(a) Planning Policies

The following are the major policies extracted from the Master-Plan established for the development of the new towns.

1) Establishment of skeletons of the new towns

To establish the skeletons of the new town, upgrading and extension of the the major and collector streets and the provision of underground public utility facilities will be carried out, so that the optimum urban growth and structure of the new towns will be obtained.

2) Provision of public utility services

The major networks for water supplies, electric power supplies and sanitary sewage services should be established as a first step toward gradually improving living standards.

3) Formation of the community cores

To function as a self-sustained service community area, the establishment of community cores which include commercial, public, recreational and institutional facilities will be implemented. The character of the community core is summarized as a center of cultural, social and economic activities in the new towns.

4) Establishment of the public park and pedestrian network

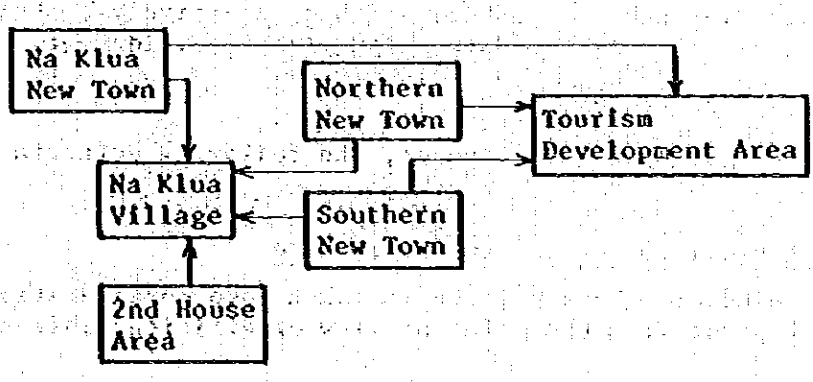
Special provisions should be made for the establishment of public parks and a pedestrian network from the houses to the working destinations, schools, public parks and to the community cores.

(b) Concepts of Community Structure

Hierarchical organization based on the following social model.

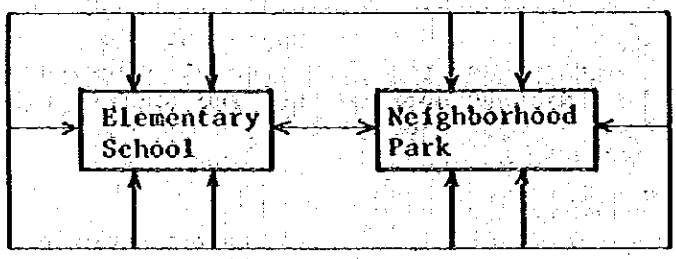
1) Future new town formation

Na Klua village is to be developed as a center for the community villages with various special facilities required by a local population of over eighty thousand. Other new towns are projected to be self-sufficient service towns for the tourism development area.

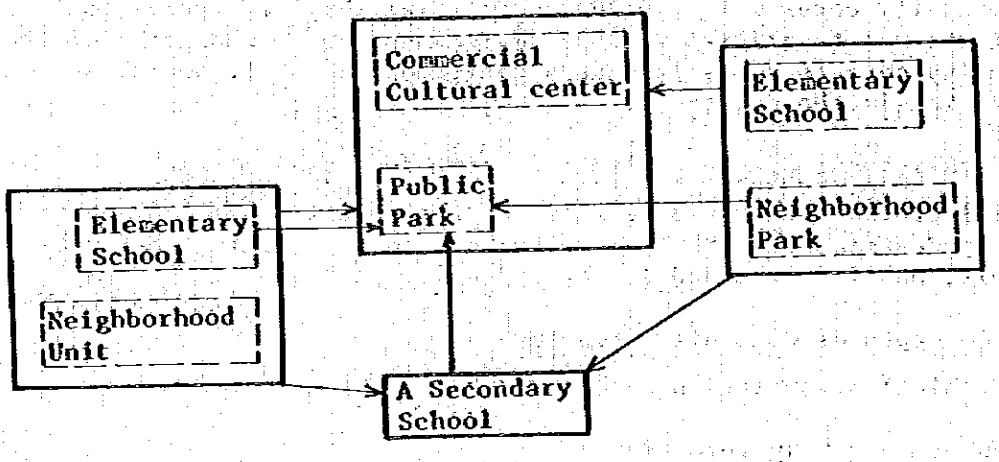


2) Neighborhood units

- Basically, a neighborhood unit will include an elementary school as its community core and a neighborhood park
- Consideration will be made for a recreational center



3) Secondary neighborhood units



A commercial and cultural center will be located at the center of each new town and a secondary school will be also located at close to the center to form a secondary neighborhood unit within a relatively large public park. The neighborhood parks and the public park are connected with the pedestrian network system, which alternatively contributes towards the formation of secondary neighborhood development.

(c) Development Phasing

As regards the phasing of development, the following criteria have been considered.

1) Efficient provision of the infrastructure

The existing clustered housing area is taken into consideration for initial development from the point of view of efficient infrastructure investment.

2) Locating commercial and community facilities at the center of the new town

In order to function as a center for social, economic and cultural activities, the establishment of the core in a central location in a new town is vital for harmonious development.

3) Phased development around the commercial and community developments

4) Segmentation of phased development areas by the main collector roads

This method of development makes it easy to define the area to be developed and to control the density and character of the blocks.

5) Formulation of adequate school districts and park districts

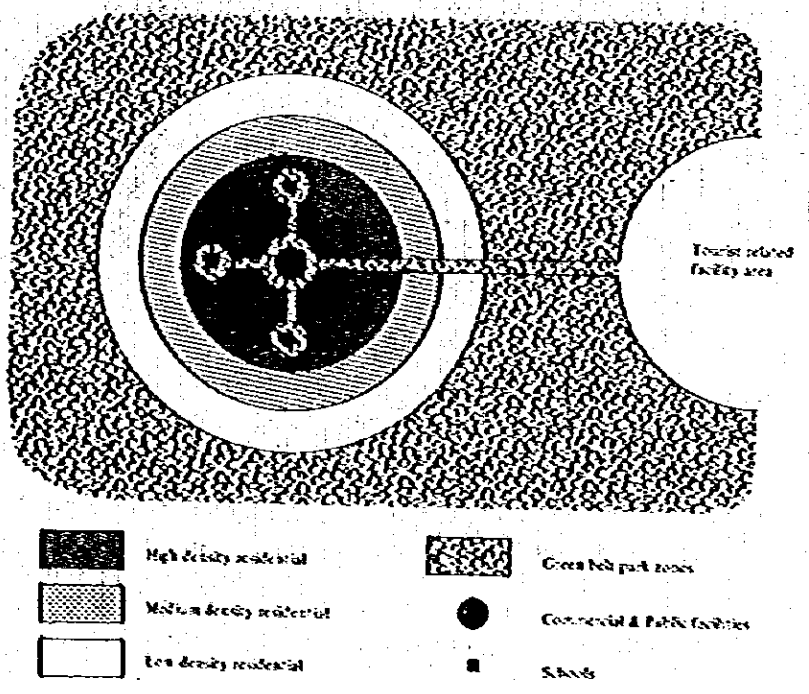
The adequate scale of school districts has to be determined according to the population distribution of the area. In this case, one elementary school per 5,000 persons with a maximum 500m walking distance to a school has been established as the criterion in the case of new town development.

6) Various housing type development in the designated areas

To meet the various demands for different housing types at each phase, each area has been defined after careful examination of the physical and natural conditions and their relation to the other areas to formulate a harmonious new town development.

3.10.5 Physical Planning Considerations

Fig. 3.9.4 Diagrammatic Illustration of the Neighborhood Plan



(a) Community Core

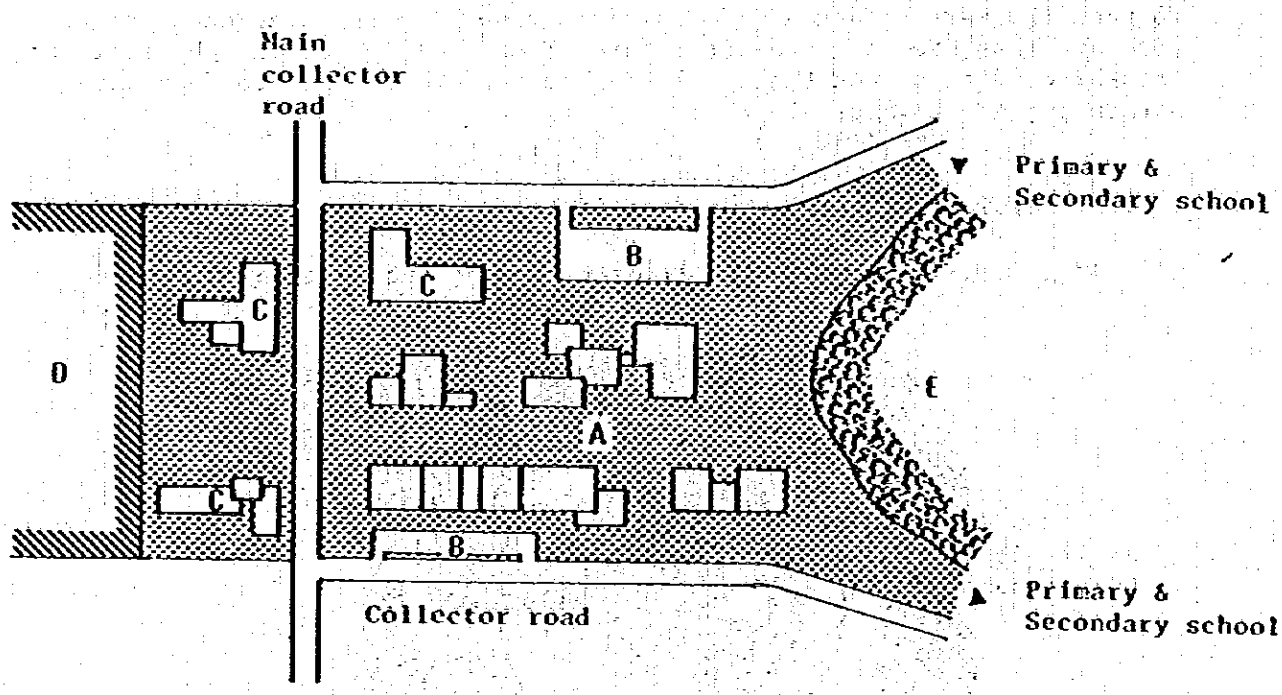
A core area will be defined inside the daily living environment where public facilities indispensable to the neighborhood unit are gathered. It will include administrative, educational, medical, neighborhood park, market and commercial facilities. Accessibility is the deciding factor for the selection of the location. The walking distance should be less than 800m. Other deciding factors to be considered are as follows:

1) Close location to existing and phase 1 housing clusters.

2) Proximity of the site to natural amenities for schools and parks

The cluster of buildings of generally two storeys, and exceptionally 3 storeys, makes it possible for the entire complex to be visually hidden among the dwelling units. However, an open space should be provided around the open shopping area to cleary distinguish it from the surrounding dwelling units. Since the community core is the source of identity for the local residences, it should be located along the major collector road.

Fig. 3.9.5 The Model Plan for the Community Core



A Plaza for open market

B Parking

C Public buildings

D Primary school

E Public park

(b) Residential Areas

In addition to the community livelihood structure, three basic housing areas are introduced to the structure of the town to meet various housing needs.

1) Housing types

Type one: High density residential area.

Gross density to be approximately 150 persons/ha.
Net density 222 persons/ha.

This area will include row houses (two storeys) and garden apartments (2 storeys). Open space for playgrounds and landscaping should be carefully considered so as to eliminate the appearance of an urban slum. Apartments and row houses in small groups are provided around the commercial area to provide a better transition between commercial areas and lower density residential areas. Each cluster should have no more than 10 units in one group and should be located around a courtyard.

Type two: Medium density residential area.

Gross density 100 persons/ha.
Net density 148 persons/ha.

Independent houses or semi-detached houses will be included in this area. Houses will preferably be located around courtyards. Cul-de-sac or loop streets will be provided to avoid a monotonous appearance.

Type three: Low density residential area

Gross density 80 persons/ha.
Net density 118 persons/ha.

Single family detached houses will be located in this residential type area. Since these people will have better means of transportation, this housing type is generally located at the outer frame of the new town. For the development pattern in this area, courtyards, cul-de-sacs and loop street systems are recommended wherever possible.

2) Distribution of various housing types

The recommended approximate ratio of the three types of housing in 1996 is as follows:

High density residential area	50%
Medium " " "	30%
Low " " "	20%

In undertaking this sensitive step of projecting the proportion of the three types of housing, the following will have to be thoughtfully examined: Family formation, family size, income level, land costs, housing costs, taxes, transportation and other elements. It is proper to say that the demand for detached housing and semi-detached housing will gradually increase as the resort is developed and the income level of the community is upgraded. Therefore, in the initial stage of the housing development, more high density housing areas should be constructed and in the later stages, more medium and low density housing areas should be added.

(c) Public Open Spaces

The areas around the new towns will be covered with greenery as park and buffer zones. Neighborhood parks should be provided in all the residential sectors. A public park should also be provided together with the commercial and public facilities. Considering the scale of the new towns (10,000 - 20,000), various playgrounds with different sizes should be located at strategic areas in the residential sectors. Open space reserved for parks has been calculated from the assumed requirement of $8m^2$ per person.

(d) Reserved Area for Urban Expansion

This is an adjustment area provided to cope with future population growth and other unpredictable conditions.

(e) Schools

The recommended primary and secondary school district population is about 2,500 and 10,000 - 18,000 respectively. The major planning principles are as follows:

1) The general location should be approximately at the center of a new town and close to the commercial and public facility centers.

2) Some facilities in the schools will be used as a community center for the social and cultural development of the residents.

3) The walking distance to the schools should be about 500m for elementary schools, 1,000m for secondary schools, 300m for kindergartens.

4) The park system will be interconnected with the pedestrian network to the schools.

5) The school district will not cross over the main collector roads.

6) Considering that the demand for secondary schools will increase, with future economic development, the existing capacity of secondary schools should be considerably raised.

The location and scale of schools have been reevaluated during the feasibility study along with the detail study of the community street network as described in volume 2, " The Local Street Network". Therefore, further detail information should be closely examined accordingly.

(f) The Local Street and Pedestrian Network

The planning principles for the local street and pedestrian path networks are shown diagrammatically as follows. In order to establish a concrete network system, much detail study has been carried out since the master plan stage. Therefore, a new chapter has been added in volume 2, to describe the results of the study. Hence, regarding this subject, only the following two diagrams are shown here.

Fig. 3.9.6 Street Network for Automobiles

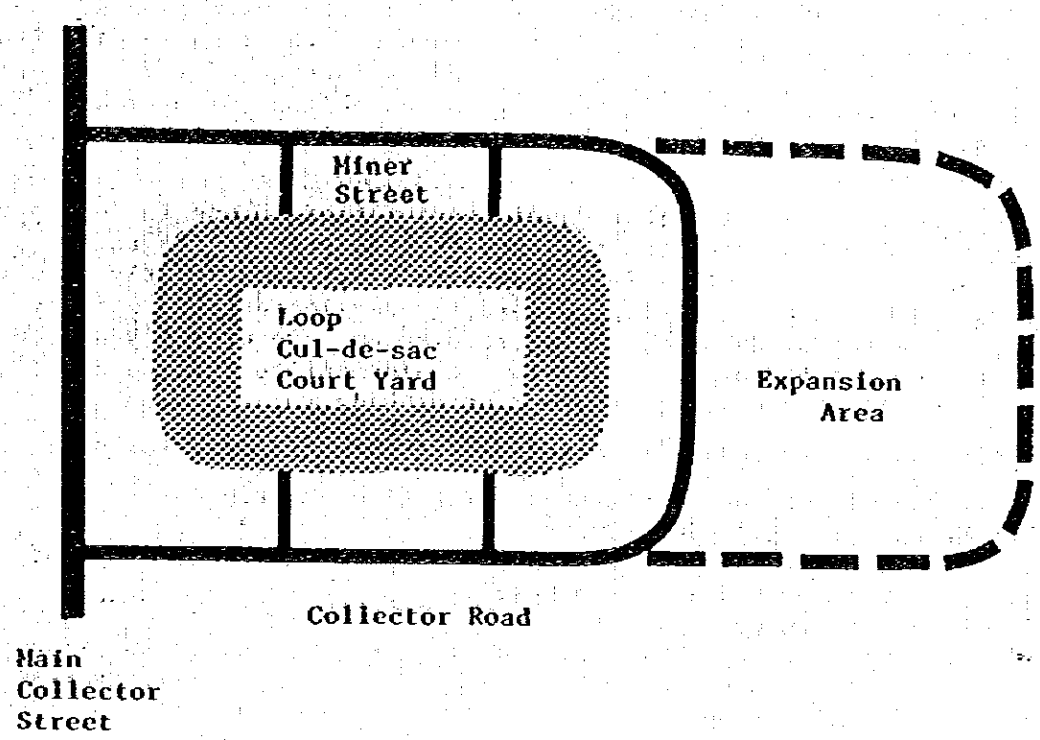
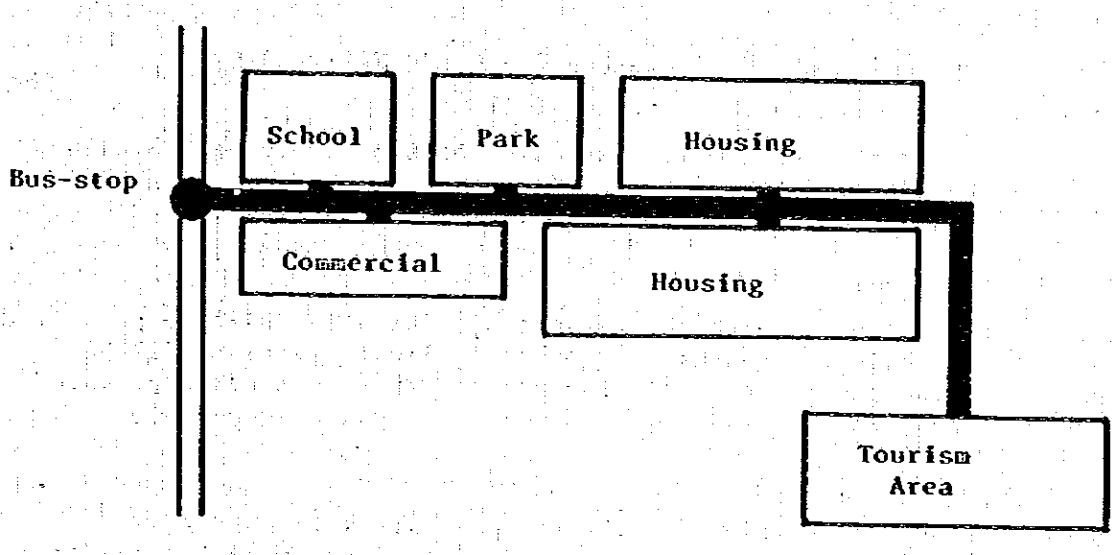


Fig. 3.9.7 Street Network for Pedestrians



3.10 Zoning Regulations

3.10.1 The necessity of zoning

The effectiveness of landuse plan is limited to the expression of the ideal development picture in the distant future. The landuse plan itself does not yeild realistic powers without the assistance of legal enforcement of zoning regulations. Therefore, the establishment of zoning is of the upmost importance to ensure that the essential purpose of the landuse plan is carried out.

There are two potential feasible development methods. One is development by a public body which acquires all the land and then leases the land to private investors. The other is development carried out mostly by private investors. Since a great deal of disorderly development has already taken place in the study area, zoning regulations are urgently needed to control the complexity of urban tourism development to provide an adequate mixture of public and private development methods.

The objectives of the zoning regulations are summarized as follows:

1. The creation and conservation of a fine environment
2. Effective public investment
3. Planned private investors to participate in the development
4. Promotion of tourism resources
5. Safety measures

3.10.2 Contents of zoning

The proposed zoning regulations are composed of five sections.

a. Development areas and conservation areas
b. Type of use or occupancy areas
c. Regulation of structures
d. Planned public facility areas
e. Special zone areas

(a) Development Areas and Preservation and Conservation Areas

The reasons for regulating these are as follows:

(i) To prevent uncontrolled expansion of the development area and to promote conservation of the environment.
(ii) To ensure effective public investment in the infrastructure.

1) Development areas

Development in accordance with the various specification will be permitted in this area. The infrastructure and other public facilities will be constructed by the public sector in advance and then controlled private investment will be invited in.

2) Conservation areas

As a basic policy, all development will be prohibited in this area including public investment. However, agricultural use will be permitted with the approval of the relevant public authorities. The following two special areas should be given separate consideration.

(i) No expansion or additions to the existing tapioca factories

should be allowed in future. Since pollution control of the waste water from the factories is urgently needed to keep the sea water along the Pattaya beach clean, adequate treatment facilities according to established standards should be provided as an urgent measure.

(11) Infrastructure services for the existing clustered housing areas along the major roads should be considered.

(b) Type of Use of Occupancy Areas

Landuse regulation is recommended to prevent uncontrolled and disorderly expansion in the development area, so that the image of an international resort will not be disturbed by the condition of the new towns, and the other main objective of improvement of the local community's living standards will be achieved. The type of use or occupancy areas are as follows:

1) Hotel area

Only hotel facilities should be allowed in this area. The definition of a hotel is any building containing 100 or more guest rooms intended or designed to be used, or which are used, rented or leased out to be occupied, or which are occupied for accommodation purposes by guests.

2) Bungalow area

Low density accommodation facilities - bungalows, villas and cottages are permitted in this area.

3) Commercial area

The type of facilities allowed here are commercial facilities, public facilities and housing-with-commercial facilities.

4) Tourism related facilities area

Facilities to promote tourism development are permitted in this area. These facilities include amenity core facilities, sports facilities, inland activity facilities and other tourism promotion facilities.

5) Residential area

The area where the living environment should be improved include housing, public facilities and small-scale commercial facilities (snack stands, drugstores). However, these commercial facilities should be restricted to the absolute minimum in scale and number at strategic locations to protect the character of a pure residential area.

6) Special residential area for villas and cottages as second houses

These resort accommodations are not for business purposes, but are to be used only as vacation facilities. The areas are located at distinctively prominent spots in the study area, so that special care has to be taken to maintain the aesthetic nature of the area.

(c) Regulation of Structures

Building regulations cover aspects of physical form and aesthetic nature. Regulations covering physical aspects include the building coverage ratios, floor area ratios, the heights of building and setback requirements.

Aesthetic regulations include color application to the exteriors of structures, building materials and other things. Regulations covering physical form will be focussed on in this section. Aesthetic aspects will be explained in the architecture section.

(d) Proposed Criteria for the Regulations

A list of regulations is provided in the zoning section of the Master Plan for reference purposes showing the maximum, medium and minimum standards which may be adopted as the criteria for regulation and the medium figures are considered most appropriate for application in Pattaya.

3.10.3 Implementation of zoning regulations

(a) Necessary Procedures for Implementing the Zoning Regulations

1) Control of the accommodation facilities

Landuse and building regulations alone would not function as an effective means for the control of the total number of required hotel rooms. Therefore, a relevant public body should determine the appropriate required number of hotel rooms and grant approval for the construction of hotels to private investors.

2) Approval of the construction of structures

Public officials should check the adequacy of and conformity to the regulations covering floor area ratios, building heights, building coverage ratios and setback requirements before giving approval for construction.

3) Permission for facilities in the zoned special area

Basing upon the principles established in the zoned special area, the various facilities proposed for construction in the amenity cores shall be evaluated for these adequacies by public officials, and alternative solutions should be enforced in the case of unacceptable proposals.

4) Site supervision of the structures after approval and permission have been granted

A checking system to ensure conformity to the conditions of approval and permission for the constructed structures should be established, and in the case of unsatisfactory conditions, termination of construction in progress or alternations to meet the regulations should be enforced to control development.

(b) Enforcement Organization

A properly established organization hold the key to whether development will be effected successfully. Further details will be described in the chapter, "Organization." Here, a proposal is made for two types of agency which are considered necessary for the enforcement of the regulations.

1) A building regulatory agency for

- acceptance of building applications
- approval of applications for general structures, except accommodation facilities and amenity core facilities

- checking adequacy of the structures on site
- other matters

2) A committee for the development of Pattaya composed of architects, planners, hoteliers, store owners' representatives, community representatives and other tourism-related representatives.

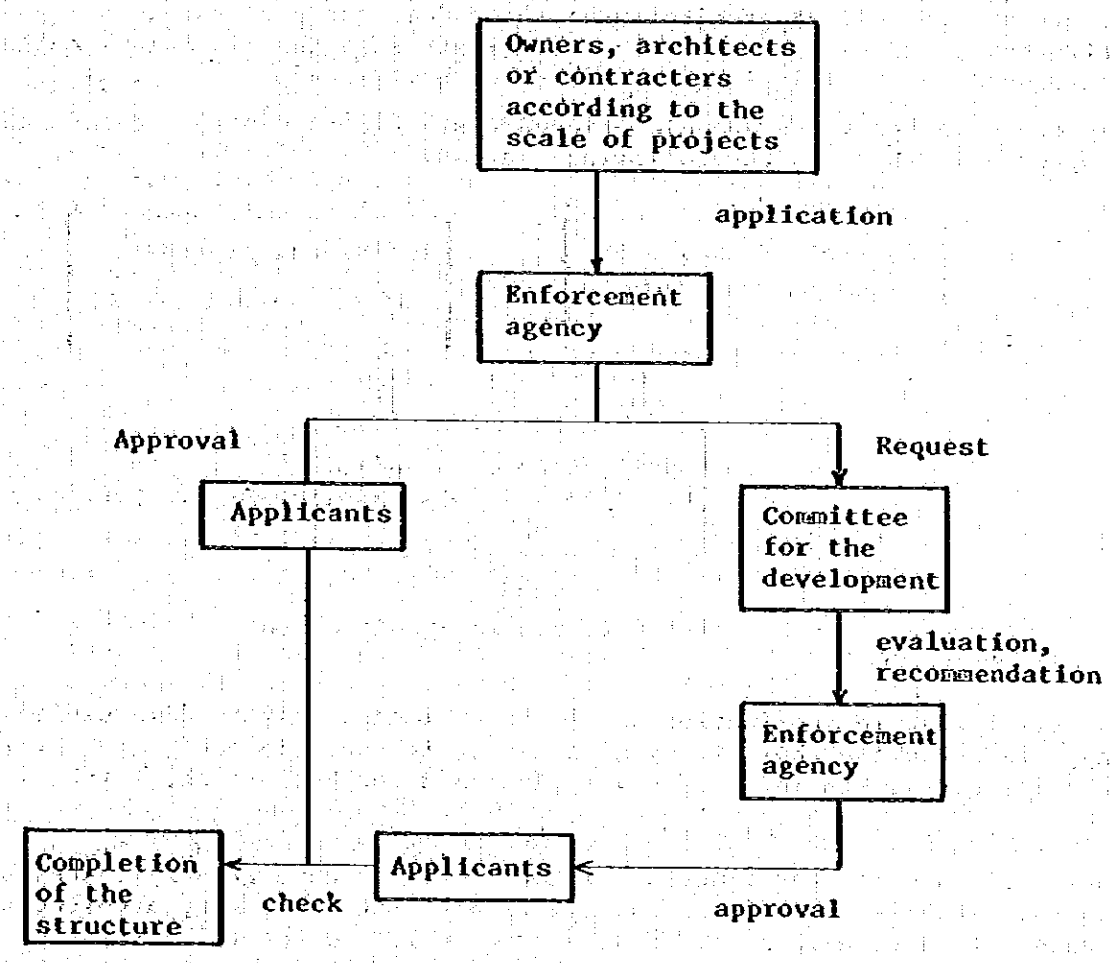
The committee should assume the following responsiblities:

- control of accommodation facilities
- permission and revision of the facilities in the zoned special area
- other items transferred from the building regulatory agency

(c) Procedures

Building construction procedures may be implemented in the following manner.

Fig. 3.10.1 Procedures for Development Regulations



3.11 Architecture and Landscape

Architecture and landscape considerations are most important to ensure that the resort is developed to meet the requirements of the development policy. For this purpose, it is necessary to establish building standard regulations for buildings, environmental controls and aesthetics. Only the main aspects are summarized in this section. Hence, subjects which are not included here are described in the Master Plan.

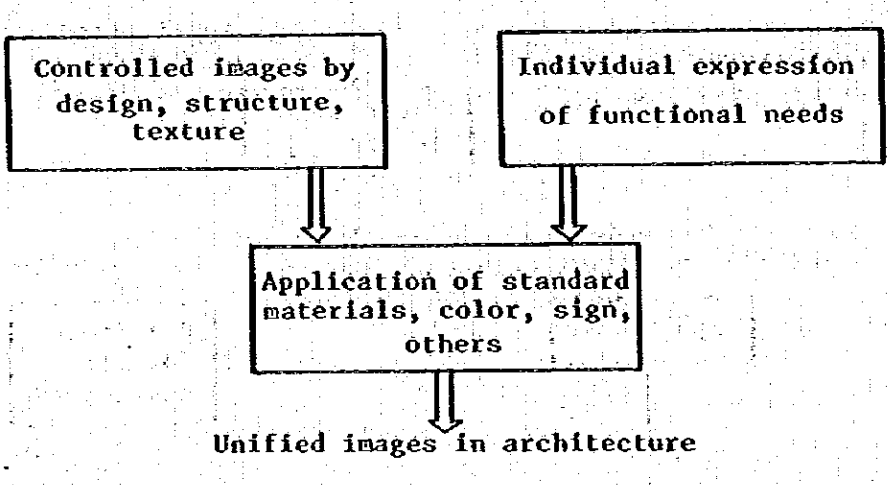
3.11.1 Architecture

(a) Design Policy

1) Architecture as a group

Individual structures possess their own functions and express visually their functions in individual ways. Taken as a group, there are some natural relationship between structures in function and in expression. Therefore, a unified architectural theme does not necessarily bring all structures under one design, but rather stresses the harmonious collections expressed in the individual character of buildings.

In order to apply the above-mentioned aesthetic concepts, a recommended approach is shown in the following diagram.



Generally, style application should be avoided to give a diversified appearance to the whole study area except in specific areas such as the amenity cores, the inland activity area and the beach area.

2) Features of the locality

Aesthetic and shelter functions in architecture have greatly contributed to the establishment of the Pattaya resort image. So far, architectural design elements have not been used or directed to the full extent possible for the promotion of a Thai atmosphere and tropical mood in the Pattaya resort. In other words, design elements such as climatic controls by natural means, and historical, cultural and social expressions in architecture have not been investigated and explored so as to create a rural character for the resort by placing emphasis on a Thai atmosphere and tropical environment. The following design elements should be respected by the community, planners, architects and other related professionals and people:

a. Examples of climatic controls

- Sun control	:	long projected overhung natural sun screens
- Rain control	:	high pitched roofs, long projected and overhung, elevated floor systems
- Natural Ventilation	:	Elevated floor systems, open structures

b. Historical, cultural and social design elements

Thai temple architecture and other distinctively expressed styles which use construction materials available in the locality are seen in residential architecture.

3) Satisfaction of functional needs

Two kinds of functional needs have been considered in view of the two different types of user of structures in the area. That is to say, one need for facilities comes from the local community and the other need comes from tourists. There is no difference in origin of the basic needs for facilities of both the local community and foreign tourists. However, the weight of emphasis should be different. As a result, two types of architectural expression reflecting the differences in their needs will be provided in the field of architecture. In the following section, some recommendations will be made based on the above line of thinking.

(b) Background in Thai Architecture

Regarding understanding of the background of Thai designs, structures and materials, needs of tourists and local inhabitants, a detail discussion has been conducted in the Master Plan.

(c) Solutions and Recommendations

1) Establishment of building standard regulations

The following regulations are proposed to guarantee safe, comfortable and convenient space for the users of the structures.

- Building standards:
  Strength of structure, safety devices or measures in structures against fire, provision of emergency shelters
- Environmental control standards:
  To establish convenient and comfortable space standards, including the following:
  * Space standards (floor area ratios, building coverage ratios, gross population densities) to control density
  * Basic sanitary facility standards
  * Lighting and ventilation standards
  * Maintenance and management standards
  * Air conditioning, standards
- Aesthetic standards:
  Standards for exterior faces of structures
  * Facade standards
  * Color coordination standards
  * Exterior material standards
  * Billboard regulations
  * Other necessary regulations to control the aesthetics of

exterior spaces

a. Sanitary control of the environment

Adequate sanitary conditions of facilities such as international hotels, restaurants and other amenity facilities have to be maintained to meet the sanitary requirements of an international resort.

- Ventilation control in terms of quality and quantity
- Provision of a high quality water supply and sewerage system
- Sanitary service standards such as room cleaning, bed sheets cleaning and other standard practices

The following Japanese environmental standards for structures are given as an example. However, considering the locality, modification of the standards will be necessary.

Environmental standards for the interior space of structures

Items	Standards
Maximum content of dust Particles in the air	$\leq$ 0.15 mg/m^3
CO content ratio	$\leq$ 10 ppm
CO_2 content ratio	$\leq$ 1,000 ppm
Room temperature	17 C$\leq$T$\leq$28 C
Relative humidity ratio	40% to 70%
Ventilation	$\leq$ 0.5 m/sec
Separated chlorine content ratio in the air	$\geq$ 0.1 ppm

b. The recommendation of a unit development design approach

To achieve a harmonious aesthetic environment, conventional methods require the following steps:

1. Establishment of aesthetic standards for each area
2. Application of standard requirements to proposed structures
3. Approval of construction

As mentioned in the beginning of this section, a conventional approach tends to create an unattractive appearance and also the problem of controlling the aesthetic outcome as a total image of the development area may still remain. Therefore, a unit develop-

ment method ought to be considered in designing wherever applicable section areas can be defined. In other words, setting up projected images of Thai atmosphere and tropical mood and designers or architects would be selected to design groups of facilities in designated area.

c. Consideration of renewal of existing structures
The establishment of building standards will be effective for new buildings. The measures to be taken for existing buildings are as follows. Minimum conditions for structures from the point of view of safety requirements and sanitary standards should be recommended. In the field of interior space environmental standards, specific facilities such as hotels, public facilities and major restaurants should be regulated by these environmental standards, which will cover both existing facilities and proposed future structures.

2) Physical design solutions

a. Row house styles
Many row house style structures have been constructed in Thailand due to the ease of construction and lower construction costs for commercial developments. This style of development tends to create a monotonous space composition as represented in the existing international market in Pattaya, which is an excessive continuous structural mass from the point of view of aesthetic considerations. Even from the standpoint of spatial experience, it is not adequate for visitors to enjoy and appreciate a Thai mood and tropical features. Therefore, the general characteristics of space arrangements created by structures should be more delicate and free as best represented in the garden-type of space composition. As a basic rule, row house styles should be avoided in future developments.

b. Design considerations for handicapped people
The recommended general policy is that Pattaya tourism facilities be open to all foreign tourists and local visitors. According to the lines of this policy, handicapped people should have opportunities to enjoy the various tourism facilities.

Especially public facilities, hotels, amenity facilities, roads and park facilities should be treated in an adequate way so that handicapped people will have the same opportunities as normal people.

c. Promotion of bicycle transport and parking facilities
There is no appropriate transportation means for intermediate travelling needs existing in the Pattaya resort. In order to go from hotel areas to the main amenity core area, visitors have to use inadequate high speed taxis which are too speedy for appreciating the surrounding beautiful views and various interesting activities. On the other hand, it is too far away to walking comfort. Therefore, more intimate private transportation means should be introduced. A recommendation for this purpose is the promotion of bicycle riding, which is the most convenient way to visit inland activity areas, amenity cores, port facilities and other interesting tourism spots. As a result, parking facilities for bicycles become an important element. Some regulations should be established to provide bicycle parking spaces at the beach road, parks, inland activity areas, public facilities, hotels and other places where people will gather.

3.11.2 Landscaping

The four main necessary characteristics for an attractive international resort are listed as follows:

- breaking away from daily routine
- hospitality
- openness and informality (exploratory, speculative and physical)
- commemorative

Such characteristics should not be taken independently but should be promoted as the basis for developing a unified over-all image of Pattaya beach. Natural development of Pattaya image provided with the above-mentioned characteristics derived from the natural, physical conditions, historical and cultural assets, manners and customs of the people should be promoted. The place of landscaping in tourism promotion is defined in this way.

There are two approaches to the promotion of the tourism development.

1. Promotion of visual aspects through landscaping
2. Conservation of aspects of tourism-related resources

The first approach involves more positive involvement in promotion and the second one involves relatively passive participation. Planners take the position of active and positive participation in creating the recommended resort image, taking also into consideration the conservation of the natural environment.

(a) Design principles

1) Uniform design

"Sun, sea and sand" are the main attractions of Pattaya. However, it is proposed that the 3 "S" appeal be accompanied by two additional streams of images, tropical mood and exotic Thai atmosphere. Visitors will get opportunities to appreciate this mood and atmosphere on Pattaya beach, under the coconut trees and on the street corners downtown. These visitors' enjoyable special experiences will become important factors in attracting more visitors. For this reason, Pattaya landscaping design will be unified under the theme of tropical and exotic features, and a special individual character will be created.

2) Harmony of facilities with nature

The main factor in Pattaya tourism development is nature itself and the facilities play a supporting role to nature. Various careful measures have to be taken for the protection of nature and for ensuring the active harmonious participation of the facilities in nature. As examples of such measures, zoning should be applied according to the potentiality of natural conditions aiming at conservation of aesthetic and environmental aspects of nature, and aesthetic facility standards should be established to ensure uniform design standards, and the application of established coordinated colors, and building material standards should be mutually coordinated to encourage the development of a harmonious tourist atmosphere.

3) Natural beauty to be open to public

It is a basic policy that the natural resources of Pattaya should be

appreciated by all visitors. In other words, a pattern of ownership of landmarks or scenic areas by the private sector, such as hotels, bungalows and private villas should be controlled. After examining the condition of natural resources in Pattaya, the beach area, the park zone around the swamps, and other designated landmark areas should be named controlled development areas.

(b) Solutions and Recommendations

1) Promotion of visual space

In order to create an attractive tourist area, detailed discussion and recommendations on the following subjects are included in the Master Plan.

- use of tropical trees and flowers
- promotion of landmarks
- landscaping of the beach area
- making good use of the existing swamp area

2) Landscape promotion of kinetic space. The subjects discussed are as follows.

- approach roads
- road parks
- street furniture

Overall application of the above recommendations is summarized in Fig. 3.11.1, Landscaping Plan. Detail physical solutions are reflected in the feasibility study, such as the road implementation plan, the storm water drainage system and the marina.

LEGEND

- PALM TREE AND OTHER ROADSIDE TREE
- PARK AND GENERAL LANDSCAPING AREA
- WATER PLANT–LOTUS AND WATER LILLY
- SYMBOL ZONE–BOUGAINVILLEA AND ORCHID
- RIVER, POND AND STORM WATER CHANNEL
- SHOPPING PARK DEVELOPMENT
- BEACH DEVELOPMENT
- LANDMARK AREA
- BUFFER ZONE FOR SEWAGE TREATMENT PLANT

FIG 3.11.1 L
(
3-

TREE
REA
ILLY
ORCHID
ANNEL

ENT PLANT

N

0 250 500 1000 2000 M

FIG 3.11.1 LANDSCAPING PLAN
(MASTER PLAN)

3.12 Classification of Investment

(a) Classification of Investment Sectors

All investment costs, excluding infrastructure, are classified as follows:

1) Public - I

The following public facilities which cannot expect a revenue return are classified in this category. Public facilities (schools) and open space in the local communities, beach facilities, open space in the amenity cores, the central park and the large scale park development in the southern park are in this category.

2) Public - II

Amusement centers and aquarium facilities are classified in this group. These facilities can be invested by either the public or private sectors and a revenue return can be expected. However, the public sector is considered to be a more appropriate developer.

3) Private - I

Among private investments, such groups of facilities as housing, villas and commercial facilities in the local communities which can not expect a revenue return from tourist income are classified in this category.

4) Private - II

Private groups of facilities which are able to be financially self-sustaining from tourist incomes are classified in this category. Hotels, commercial facilities in the amenity cores and inland activity facilities are in this category.

(b) The approach for calculating the approximate total investment cost adopted is based on the assumption of a unit cost per area or per unit based on past experience on similar projects in or near Pattaya.

1) Construction costs

With construction costs, the cost of site preparation and landscaping are included in addition to building costs. Unit construction costs are generally based on local Thai standards and with regard to items where local unit costs are unavailable, standard Japanese unit costs are used as references and certain assumptions are made.

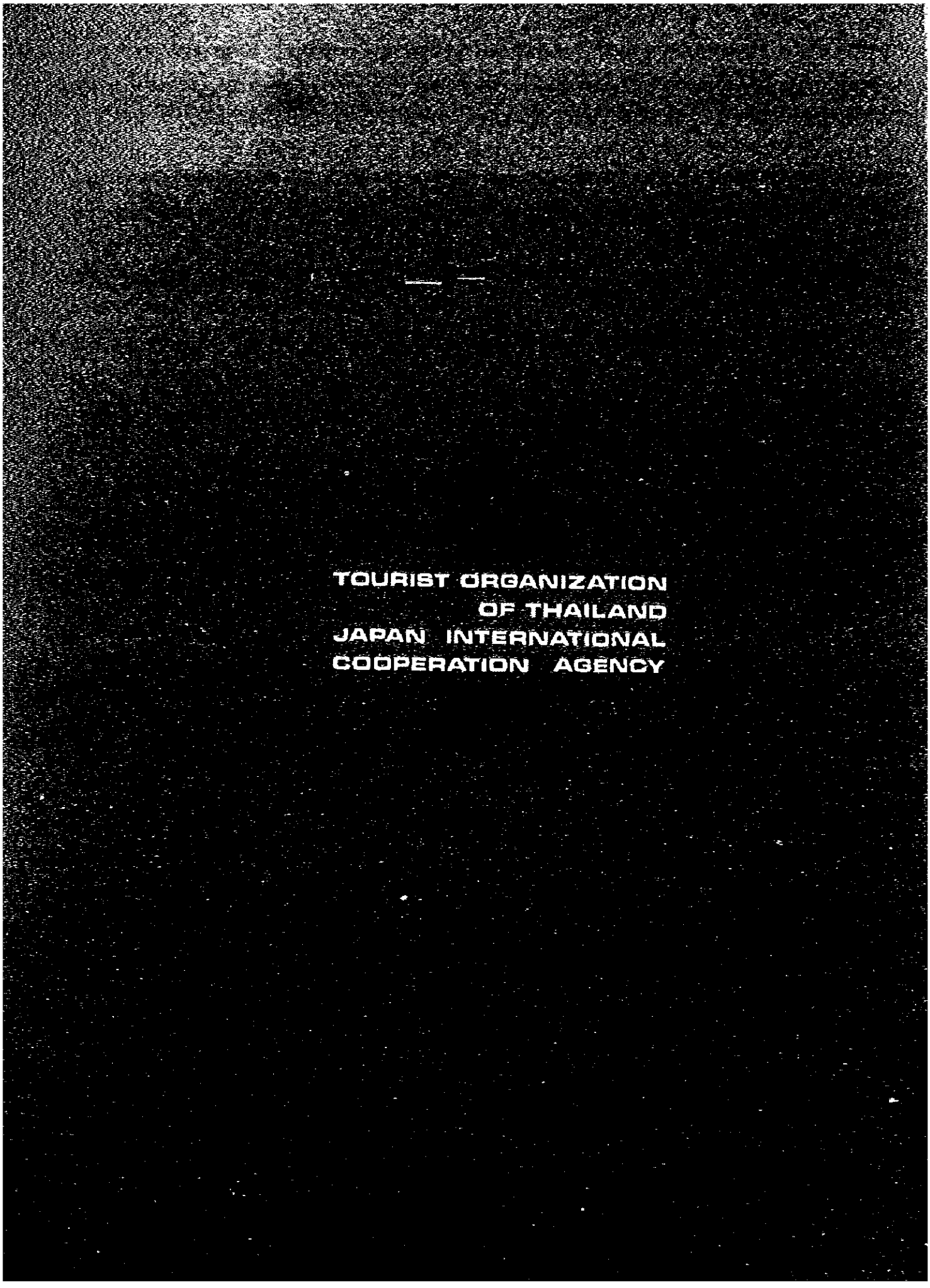
Regarding the distribution of local currency and foreign currency, the ratio of foreign currency is between 0% to 50% and will be decided on a case by case basis.

2) Land cost

The cost of land is based on the data provided during the field survey, which varies between 100 Bahts/m^2 to 2,000 Bahts/m^2 according to the area.

3) Maintenance costs

Maintenance costs include only the required costs for Public I category, since in other categories this item is recoverable from revenue. Personnel and utility expenses are included in maintenance costs.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