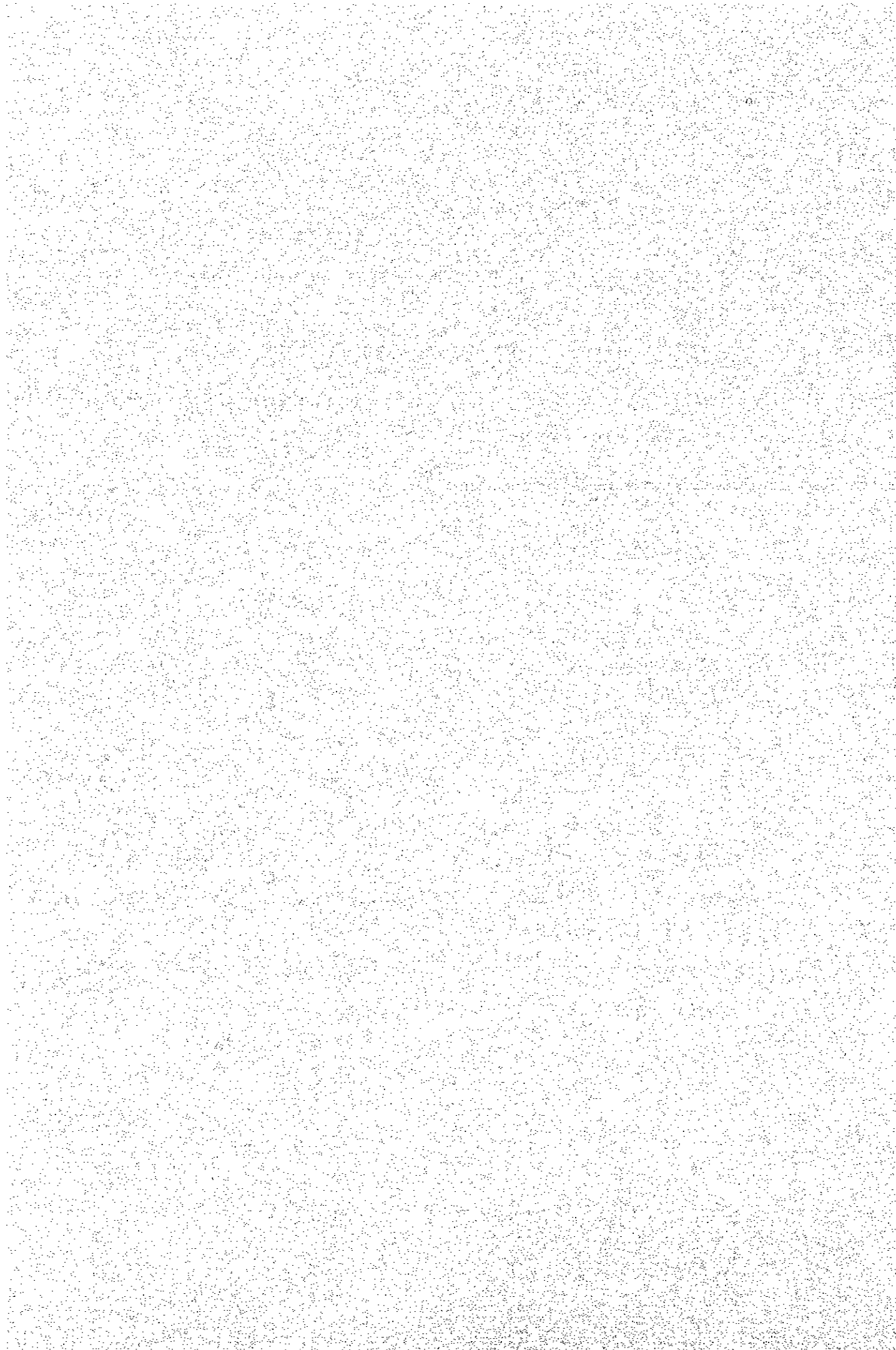


5. Strategy of Cancun

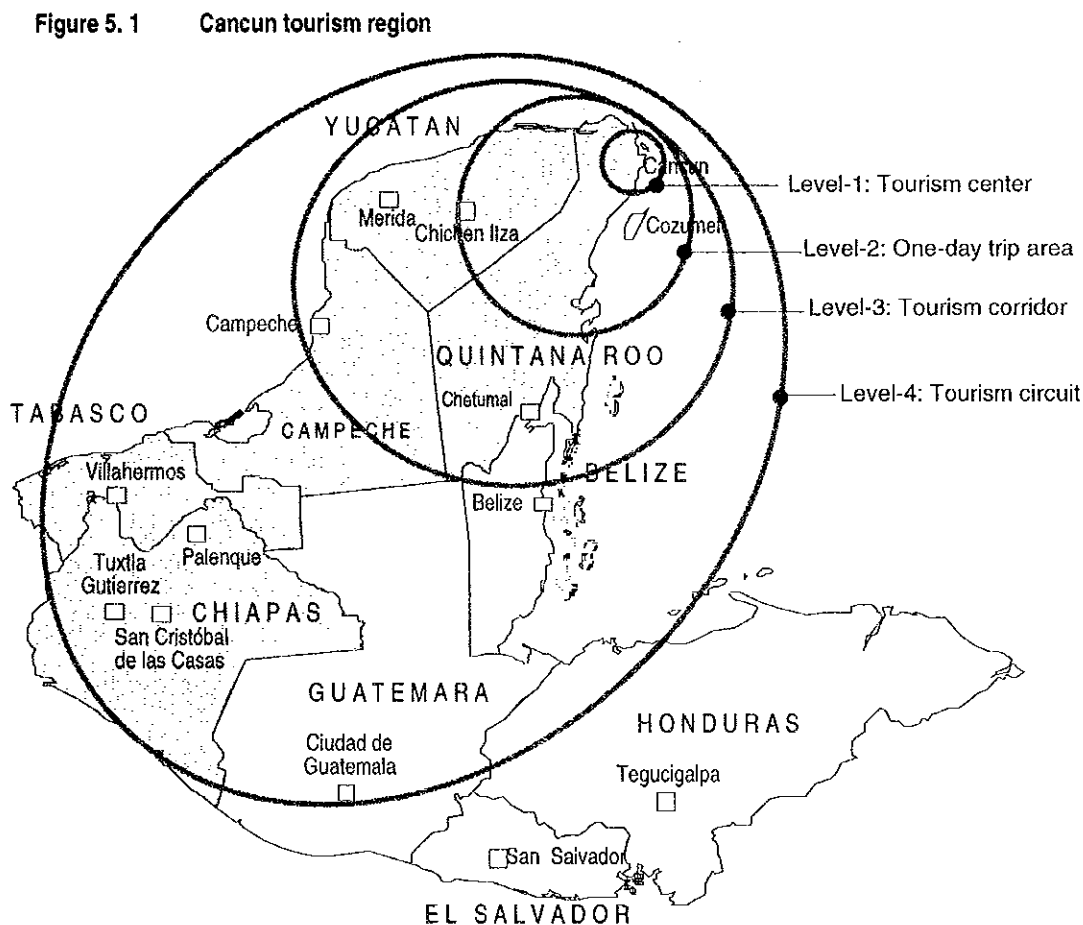


5. Strategy of Cancun

5.1. Regional context

5.1.1. Location of the Cancun tourism region

Figure 5. 1 shows the location of Cancun and its tourism region. Table 5. 1 defines areas that correspond to respective levels of the hierarchical system of the tourism region.



Source: JICA study team

Table 5. 1 Hierarchy of the Cancun tourism region

Levels	Coverage	Main discussions
Level-1	Cancun	Tourism center
Level-2	Vicinity of Cancun (Part of the state)	One-day trip area
Level-3	Quintana Roo, Yucatan	Tourism corridor / tourism zone
Level-4	Inter-state: Quintana Roo, Yucatan, Campeche, part of Tabasco, part of Chiapas	Tourism region (One-week touring circuit)

Source: JICA study team

5.1.2. Physical and socioeconomic conditions

The Quintana Roo state has a territory of 50,843 square km, with 400 km of coastline along the Gulf of Mexico, and 860 km along the Caribbean Sea.

The population is around 650,000 with an annual growth rate of 9.1%. GRDP of the state was \$ 5.49 billion, and per capita GRDP was \$ 11,130 in 1990.

The tourism sector is the most important sector in the state consisting 58.6% of the GRDP of the state. It is followed by the manufacturing industry. Two industrial parks are located in Chetumal and Carrillo Puerto. Tourism generated US \$1,486 million, created 47,700 jobs in direct employment.

FONATUR's policy at the beginning of the project was to develop a huge tourism center in an economically marginalized area to promote regional development. It, however, has caused urban problems in the downtown area such as lack of residential space poor utilities services since the population growth that accompanied the tourism development was far higher than the expected. The lack of infrastructure lead to the deterioration of the both natural and social environments. As the hotel zone in Cancun is monotonous and tends to lack in attractions, tourist inflow into the downtown area escalated the problem.

Cancun needs to locate tourist activity areas out of the downtown and the hotel zone. It is envisaged in this context to develop new tourist attractions in the adjacent areas to Cancun. Enforcement of Cancun's gateway function and dispersion of visitors to neighboring states and countries by promoting touring circuits from Cancun is another possibility to solve the problems.

The major indices of physical and socioeconomic conditions of the Quintana Roo state and Cancun are summarized in Table 5. 2

Table 5. 2 Major indices of physical and socioeconomic conditions of the Cancun tourism region

Items		Descriptions	
Quintana Roo state			
Geographical Conditions	Area	50,843 km ²	
	Coastal line	1,260 km	
	Gulf of Mexico Caribbean sea	400 km 860 km	
Climate (Puerto Morelos)	Temperature	Highest; 29.2°C (July) Lowest; 24.6°C (January) Average; 27.0°C	
	Rainfall	Highest; 201.0 mm (October) Lowest; 24.0 mm(March) Total; 1,098.2 mm	
Population	Total in 1994	650,000	
	Growth rate per annum	9.1 % (80/90)	
	Population density	12.78 capita/ km ²	
GRDP (1990)	Total GRDP	\$ 5.49 billion; 3rd lowest state	
	GDP per Capita	\$ 11,130	
Employment (1990)	Total	(Persons)	(Composition, %)
		163,190	100.0
	Primary		19.6
	Secondary		15.5
	Tertiary		58.8
N.C.		6.1	
Major Industries		Tourism, Manufacturing, Agriculture	
Cancun(Benito Juárez)			
Population *		311,769	
Employment (1990)	Total	(Persons)	(Composition, %)
		67,104	100.0
	Primary	1,210	1.8
	Secondary	11,612	17.3
	Tertiary	49,451	73.7
N.C.	4,831	7.2	

Note: Censo de Población y Vivienda 1995 (INEGI)

Source: Quintana Roo state census, compiled by JICA study team

5.1.3. Regional development programs

(1) Regional development program of the Quintana Roo state

The Regional Development Program of the state of Quintana Roo (1993-1999) specifies general and specific objectives as follows:

a. General objectives

General objectives of the regional development program area:

- To consolidate, diversify, and raise the quality of tourism services,
- To reduce regional disparity and the risk of concentrating on a single sector,
- To create employment,
- To satisfy the demand for security and justice,
- To conserve the natural environment, and
- To eradicate extreme poverty.

b. Specific actions to achieve the objectives

The followings are specified in the program as the actions to achieve the objectives:

- To diversify the economic structure through diversification of investment,
- To link tourism areas,
- To exploit other productive potentials such as fishing, forestry, and, other industries,
- To modernize the state through promotion of private investment, and stability in production conditions, and
- To create infrastructure and provide services.

(2) Tourism development program of the Quintana Roo state

The Regional Development Program of the state of Quintana Roo (1993-1998) specifies the followings:

- To improve quality of services,
- To diversify tourism attractions,
- To establish integrated tourist circuits,
- To balance tourism and urban services, and
- To protect ecological systems.

Cancun and the Cancun-Tulum corridor deserve special attention as to the above objectives. In order to fulfill the objectives, following strategies were set:

- To elaborate an integral program for the protection of environment, adequate sewage system, new sanitary fillings, and improvement of all tourist services,
- To establish a regulation plan of Cancun - Tulum corridor development,
- To force mega development to consider ecological tourism,
- To promote cruise ship tourism with enhancement of the landing system in Cozumel,
- To develop ecological tourism in the south zone of Cancun - Tulum corridor,
- To develop archeological tourism with improvement in infrastructure in Kohunlich, Kinichna, and Tzibanche, and integrate them into the Mundo Maya circuit, and

-
- To consolidate the infrastructure in Chetumal to convert it as the center of receiving visitors in the south zone.

(3) Tourism development program of Benito Juarez municipality (Cancun)

General objectives of the Benito Juarez municipal government are as follows:

- To maintain and increase public services
- To promote tourism
- To protect the environment, and
- To design tourist spaces in consideration of natural harmony and beauty.

To achieve these objectives, the municipal government requires

- to improve administration resources,
- to encourage participation of society, and
- to closely coordinate federal and state governments.

Development policies related to the tourism are summarized as follows;

- Target growth of international tourist arrivals: 167,400 visitors in 2000 and 3,136,100 visitors in 2010,
- Target growth of domestic tourist arrivals: 880,500 visitors in 2000 and 1,380,200 visitors in 2010,
- Target length of stay average: 5.6 days for international tourists and 4.1 days for domestic tourists,
- Target spending of international visitors per day: US\$ 149 (assumed) to gain revenues of US\$ 261.6 millions by the end of 2010.

Target number is based on the FONATUR study (Programa de infraestructura para areas de desarrollo turistico) edited in July, 1993

5.1.4. Tourism in the Quintana Roo state

Table 5. 3 summarizes indices that show the current conditions of tourism in the Quintana Roo state.

Table 5. 31 Major tourism indices of the Cancun tourism region

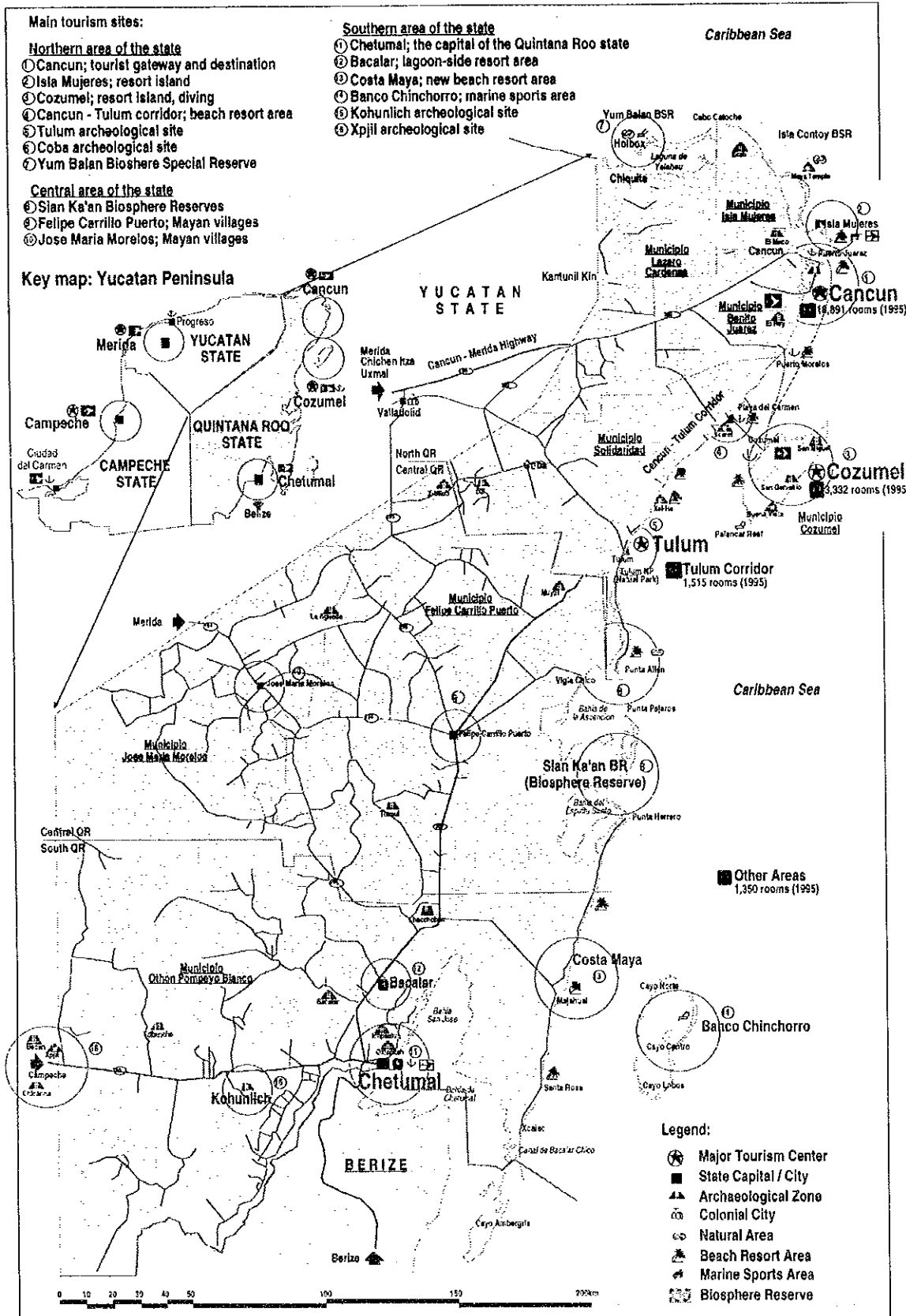
Items				
Contribution of Tourism Sector (1992)	GRDP	US\$ 1,486 million (58.6 % of total GRDP of the state)		
	Direct employment	47,700		
	Indirect employ	900,000		
Cancun Market (1995)	North America	81 %		
	Europe	10 %		
	Latin America	8 %		
	Asia and others	1 %		
Visitor arrivals to hotels (1995)		Total	Domestic	International
	Total of the state	2,701,873	588,901	2,112,972
	Cancun	2,154,608	488,769	1,665,839
	Cozumel	310,302	66,844	243,458
	Isla Mujeres	25,508	2,768	22,740
	Playa del Carmen	115,123	7,003	108,120
	Others	96,332	23,517	72,815
Passengers by airplane(1994p)	Cancun	Domestic	International	Charter
		517,700	633,900	1,046,400
Hotels and visitors (1995)		hotel rooms (rooms)	Occupancy ratio (%)	length of stay (bed/night)
	Total of the state	25,098	72.8	5.20
	Cancun	18,891	75.8	5.23
	Cozumel	3,332	59.7	4.62
	Isla Mujeres	494	39.8	5.12
	Playa del Carmen	1,515	75.2	6.32
	Others	866	73.0	5.14

Source: SECTUR data, compiled by JICA study team

Figure 5. 2 shows the existing conditions of the Cancun tourism region. Tulum Corridor is the coastal area between Cancun and Tulum where tourism development projects are under way. JICA study team proposes to extend the corridor to the south to formulate Cancun - Costa Maya Resort Belt that includes Cancun - Tulum Corridor and newly proposed development site of Costa Maya.

Mundo Maya Circuit is a multi-country touring circuit that extends over the Quintana Roo, Yucatan, Campeche, Tabasco, and Chiapas states in Mexico, as well as Guatemala, El Salvador, Honduras, and Belize. Cancun-Merida Corridor is part of the circuit. A smaller circuit of Cancun - Merida- Campeche- Chetumal is referred to as Northern Mundo Maya Circuit in this study.

Figura 5.2 Existing conditions of Cancun tourism region



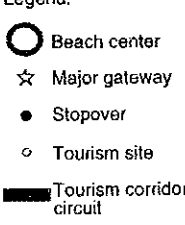
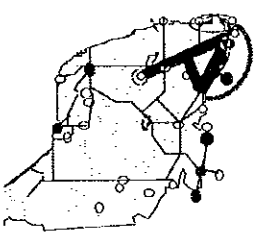
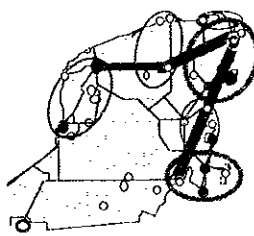
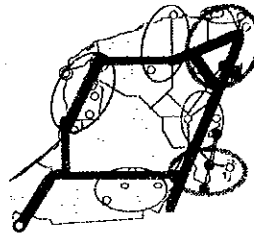
Source: JICA study team

5.2. Assessment of tourism development and promotion scenarios

5.2.1. Alternative scenarios for the Cancun tourism region

Three alternative scenarios for the Cancun tourism region were set according to the methodology as discussed in the theoretical framework section.

Figure 5.3 Alternative scenarios for the Cancun tourism region

	Alternative-1	Alternative-2	Alternative-3
Legend: 			
Diversification of tourism products	Diversification level: low - Development of Cancun-Tulum Corridor for beaches/activities - Archeological tourism in the north - Ecotourism in biosphere reserves	Diversification level: medium - Development of Cancun-Costa Maya Resort Belt for beaches/activities - Archeological tourism in the north - Ecotourism in biosphere reserves - Some linkage with Mundo Maya Circuit	Diversification level: high - Development of Cancun-Costa Maya Resort Belt for beaches/activities - Archeological tourism in the north - Ecotourism in biosphere reserves and archaeological sites - Close linkage with Mundo Maya Circuit
Target markets	- Concentration on the traditional market; North America	- Expansion of the traditional market; North America - Development of new markets: Europe, Asia, Latin America, domestic	- Consolidation of the traditional market; North America - Development of new markets: Europe, Asia, Latin America, domestic
Tourism administration	- Easiest coordination for development and promotion within Greater Cancun	- Coordination in the state for development - Coordination of Fondos Mixtos in the neighboring states for tourism promotion	- Coordination of neighboring states for development - Coordination of Fondos Mixtos in the neighboring states for tourism promotion - Coordination of international Mundo Maya program
Development/ tourism promotion costs	- Development costs; low - Sales promotion costs; low - Investment concentration effect; high	- Development costs; medium - Sales promotion costs; medium - Investment concentration effect; medium	- Development costs; high - Sales promotion costs; high - Investment concentration effect; low

Source: JICA study team

Alternative-1:

- concentrates development efforts on Cancun-Tulum Corridor for beaches resort tourism,
- develops tourism products in the one-day trip area (Level-2) from Cancun including a one-day excursion triangle of Cancun - Tulum - Chichen Itza - Cancun,
- target primarily at short-haul beach resort tourism.

Alternative-2:

- develops Cancun-Costa Maya Resort Belt for beach resort tourism,
- formulates Cancun- Merida Corridor, and develops tourism products in the tourism corridor area (Level-3),
- introduces some linkage with Mundo Maya Circuit, and
- targets at both short-haul beach resort tourism and the long-haul market.

Alternative-3:

- develops Cancun-Costa Maya Resort Belt for beach resort tourism and the base for the touring of Mundo Maya Circuit,
- develops ecotourism-based tourism products along Northern Mundo Maya Circuit.
- establishes firm linkage with multi-country Mundo Maya Circuit, and
- develops the long-haul market while sustaining the growth of short-haul beach resort tourism.

5.2.2. Selection of a scenario

The three scenarios were assessed from the view point of development stage of tourism destination, potential and type of tourism resources, and development possibilities as discussed in the theoretical framework section. JICA study team concludes that **Alternative-3** is the best scenario for Cancun tourism region. The rationale for this choice is summarized as follows:

- Cancun is at the maturity stage of resort life cycle. Both introduction of new developments to cater for different types of visitors, as well as revitalization of existing tourism center to maintain existing market are needed at this stage.
- Alternative-1 is not an appropriate scenario as the share of the long-haul market in Cancun is already the highest of all the Mexican tourism destinations.
- The Cancun tourism region has one of the most competitive accumulation of tourism resources in the world. Besides, archaeological sites and living tradition of indigenous cultures are the type of tourism resources that appeal the most to the long-haul market.
- Many of archaeological and natural tourism resources are located in the tourism circuit area (Level-4). Their tourism potential rationalizes the necessity to establish a touring circuit that covers these tourism sites.
- The airport survey conducted by JICA study team shows that Cancun is the destination which is the most frequently combined with touring itineraries ranging from one day-trip to Chichen Itza to two-week multi-country trip covering the whole Mundo Maya area.
- Promotion of Mundo Maya Circuit is a national policy.
- Considering the high tourism potential of Mundo Maya Circuit and Cancun - Costa Maya Resort Belt, Alternative-2 is still a humble scenario, and fails to tap the tourism opportunities of the tourism region. Therefore, Alternative-3 is the best scenario for the Cancun tourism region. Cancun, however, needs measures to save the existing beach center from environmental and urban problems.

5.3. Tourism strategy of the Cancun tourism region

5.3.1. Tourism development and promotion strategy

Since Cancun is reaching its maturity stage, its strategy for the next century should be two-pronged; to maintain the high image of Cancun on one hand, and to create Cancun - Costa Maya Resort Belt to distribute sun seekers to a wider area and make the resort belt serve as the base to explore Mundo Maya Circuit on the other.

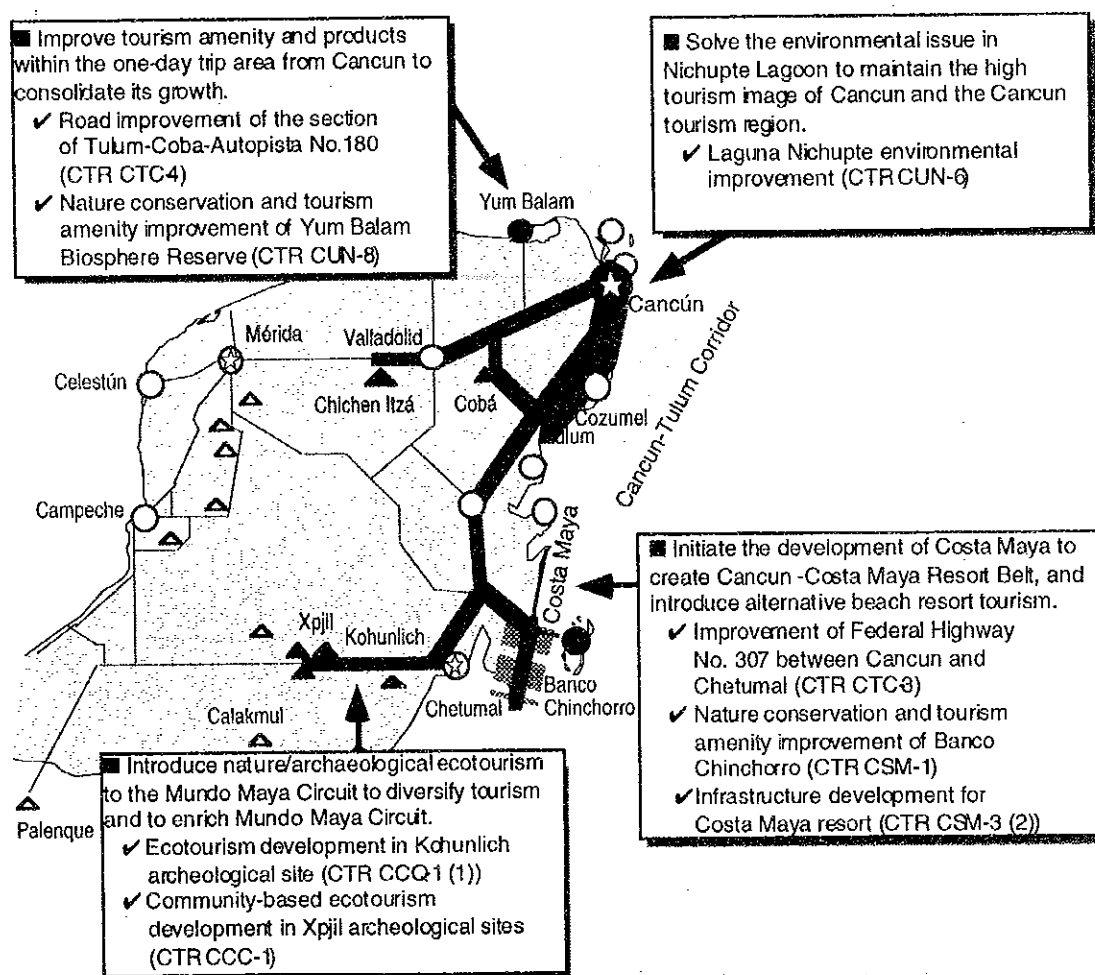
The high image of Cancun would make a prerequisite for the strategy of the Cancun tourism region. In this sense, solving of urban and environmental problems, and introducing measures to revitalize the aging hotel zone in Cancun is important. It is necessary to introduce an alternative type of beach development to Cancun - Costa Maya Resort Belt and ecotourism to Mundo Maya Circuit to diversify tourism markets for the sustainable growth of the tourism region.

(1) Action plan strategy by 2002

At the action plan stage, solving the environmental issue in Nichupte Lagoon has the first priority to sustain the growth of the Cancun tourism region.

On the other hand, Cancun should improve tourism network and tourism products within its one-day trip area, prepare infrastructure to develop Costa Maya, and to introduce ecotourism in the Mundo Maya Circuit as detailed in Figure 5. 4.

Figure 5. 4 Action plan strategy of the Cancun tourism region



Source: JICA study team

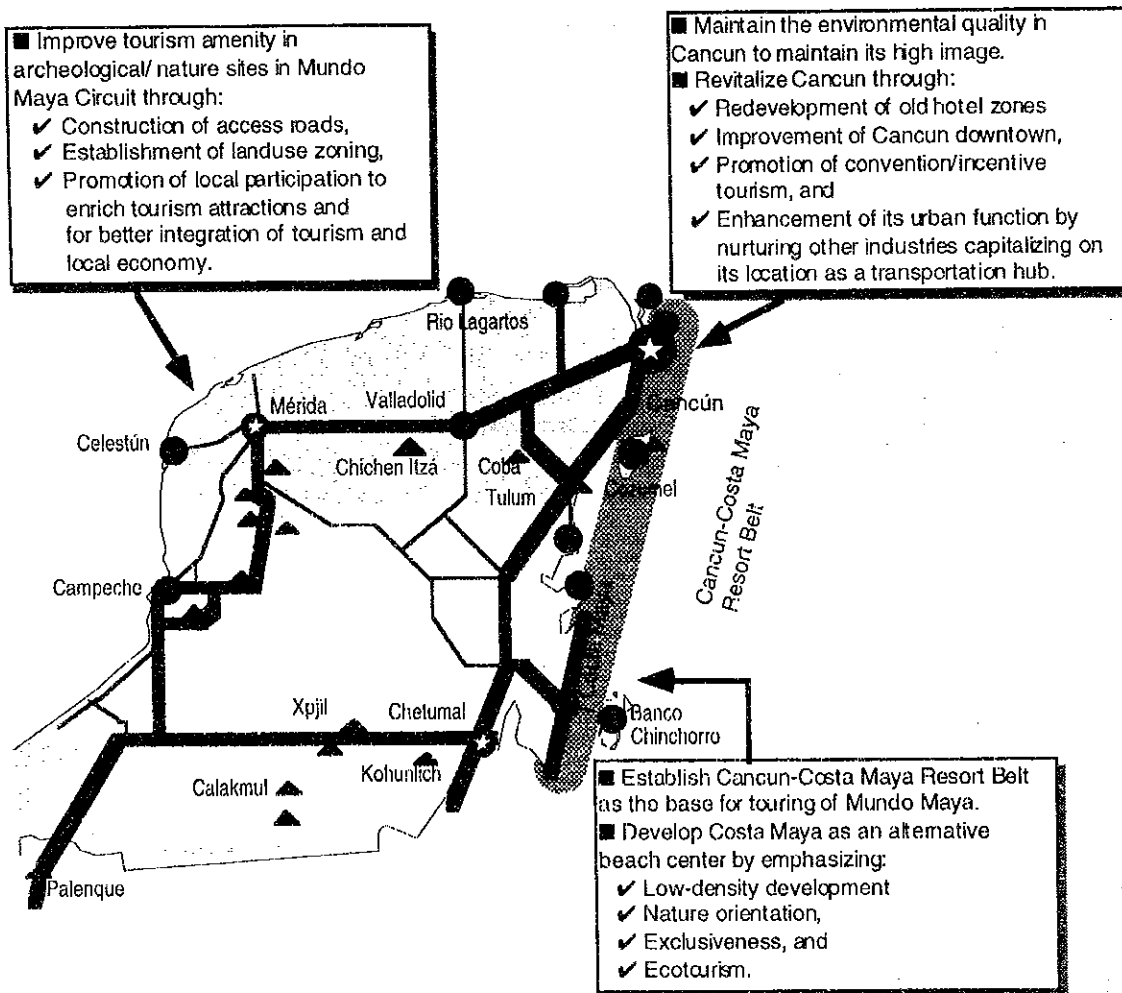
(2) Long-term strategy by 2010

By the target year of 2010, the Cancun tourism region should develop Costa Maya as another beach center, and formulate Cancun - Costa Maya Resort Belt. The resort belt should include various types of beach resort development from high-rise hotels in the Cancun hotel zone to an exclusive ecolodge style accommodation in Sian Ka'an thus catering for different types of visitors.

Community-based ecotourism combined with archaeological tourism should be thriving at various sites along Mundo Maya Circuit. Banco Chinchorro should be introduced as another diving destination comparable to Cozumel.

In spite of the expansion policy of the tourism region, revitalization of Cancun is another important issue. Convention and incentive tourism would be an important target of old Cancun. The resort city should enhance its urban function to be a hub of transportation and communication further development like the case in Miami in the USA. Figure 5. 5 details the long-term strategy.

Figure 5. 5 Long-term strategy of the Cancun tourism region



Source: JICA study team

5.3.2. Spatial structure of tourism

Proposed spatial structure of the Cancun tourism region in the target year 2010 is detailed as shown from Figure 5. 6 to Figure 5. 9.

Figure 5.6 Spatial tourism structure of the Cancun tourism region (Level 4)

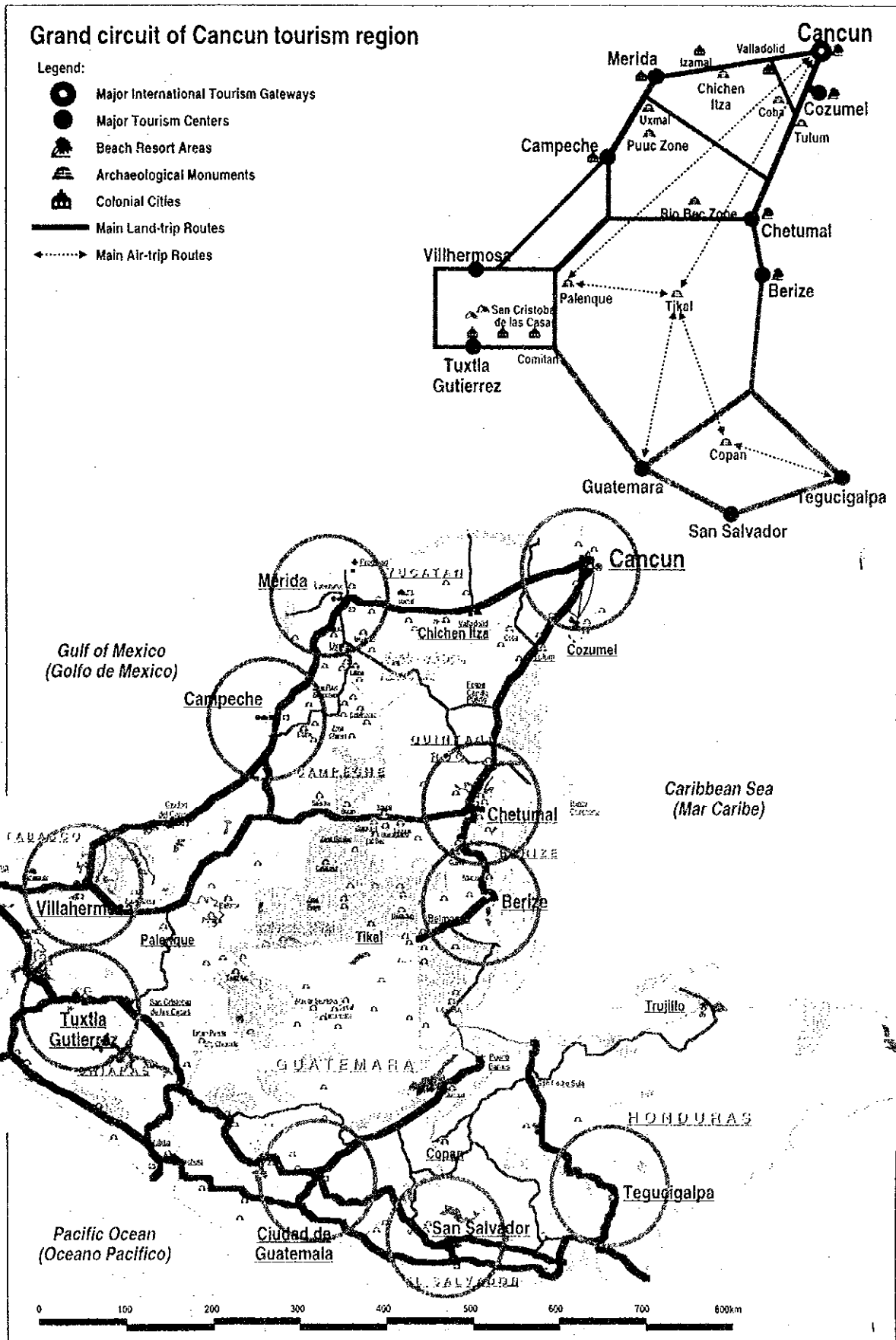


Figure 5.7 Spatial tourism structure of the Cancun tourism region (Level 3)

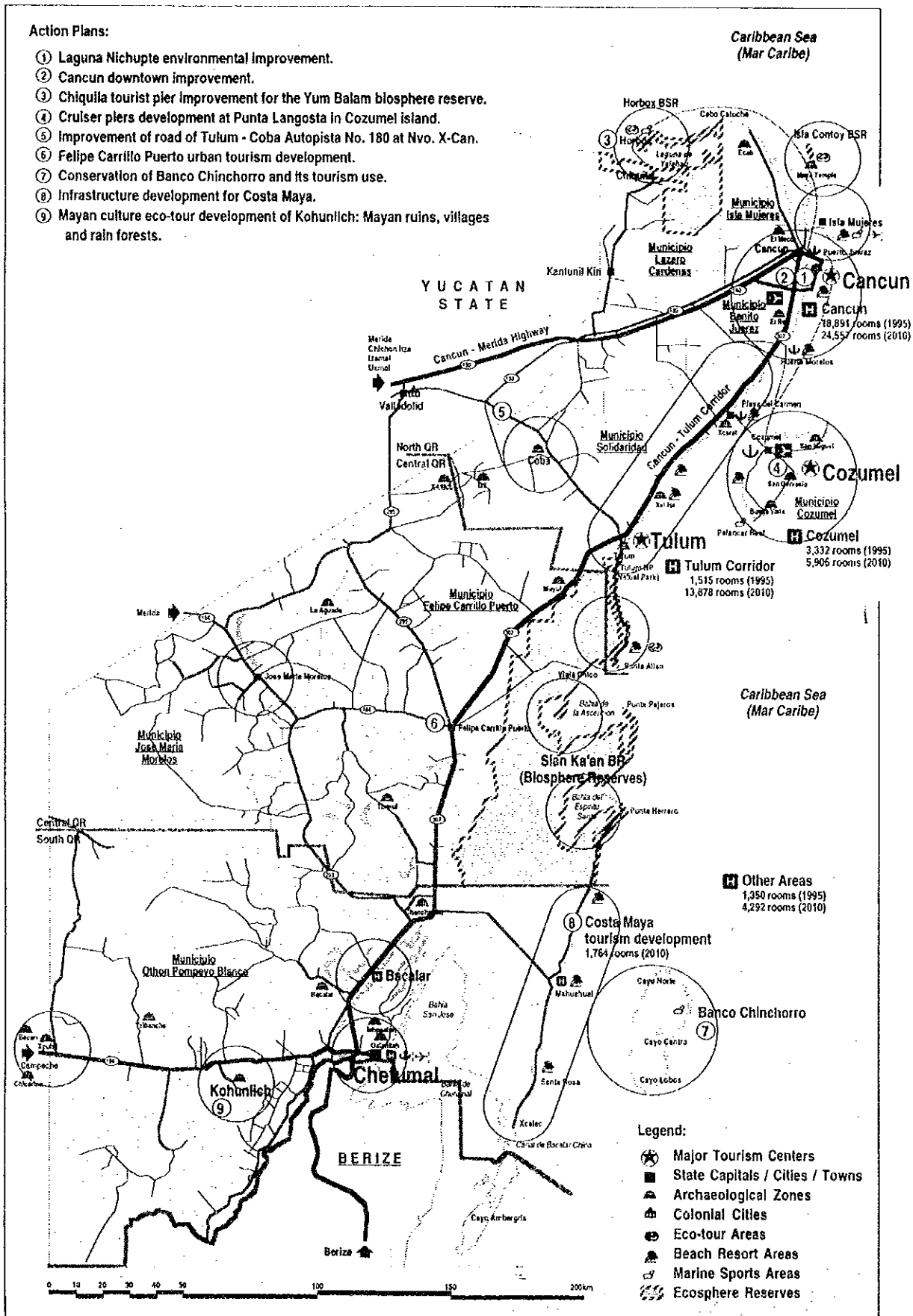


Figure 5.8 Spatial tourism structure of the Cancun tourism region (Level 2)

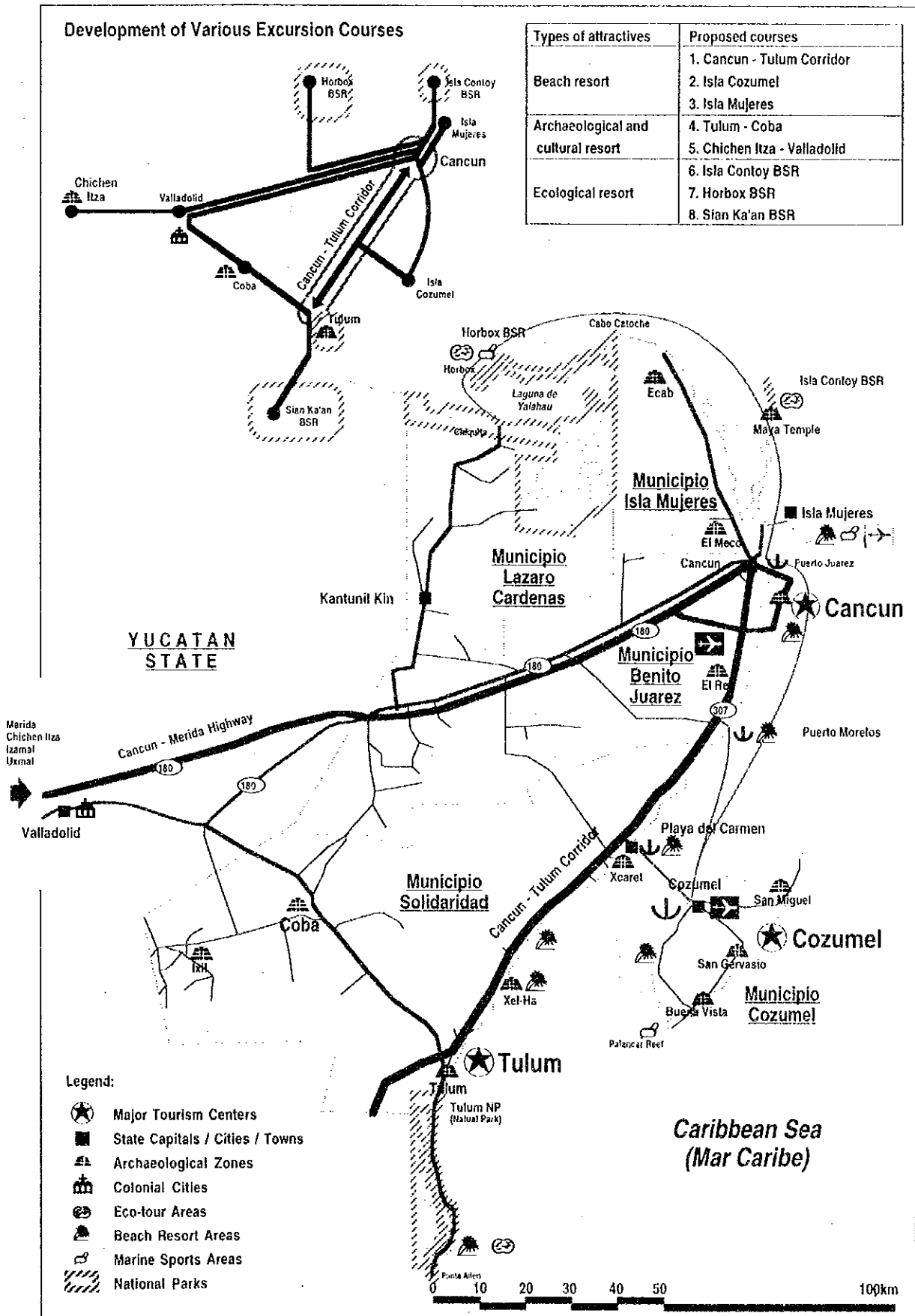
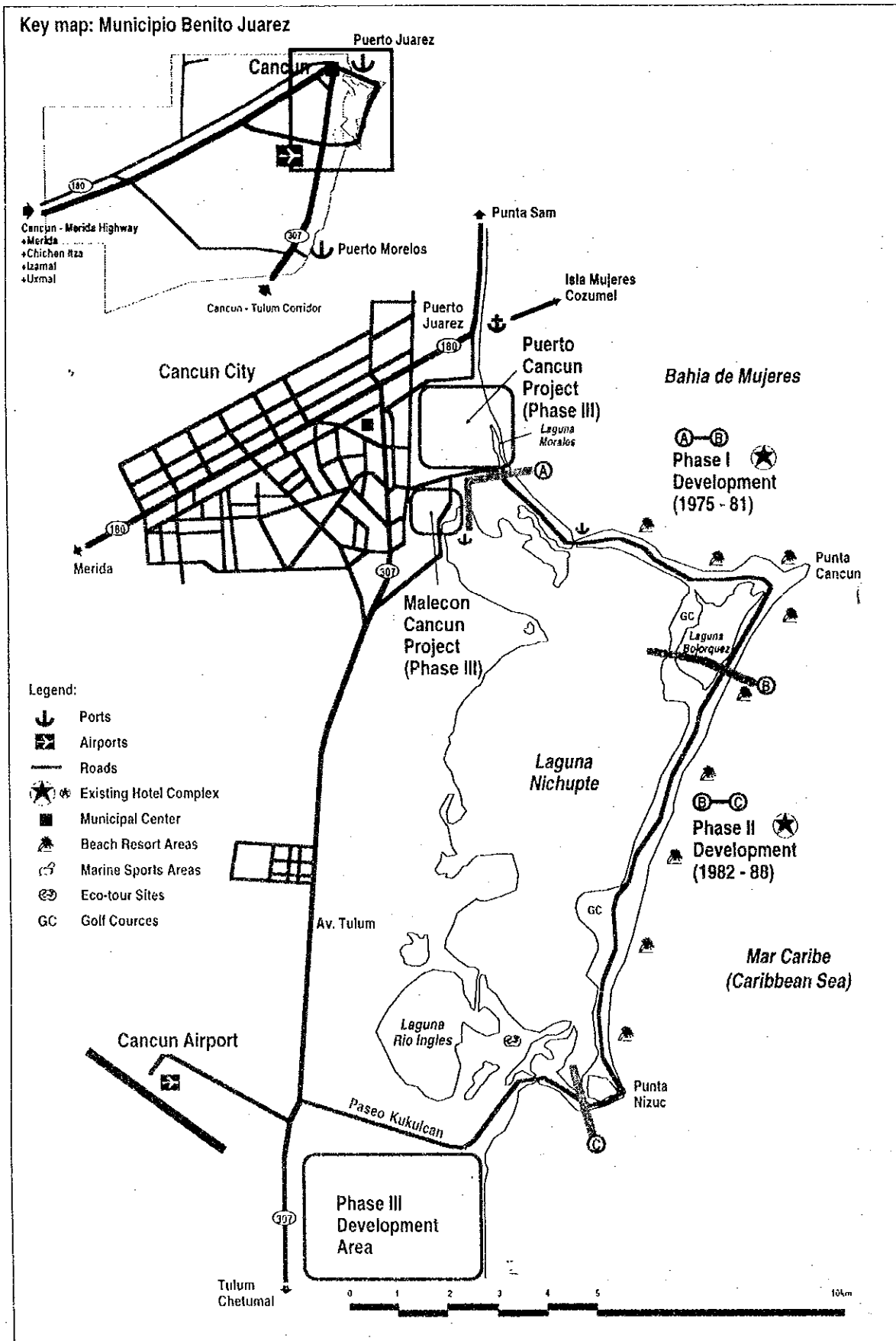


Figure 5.9 Spatial tourism structure of the Cancun tourism region (Level 1)



5.3.3. Marketing directions

(1) Tourism images of the Cancun tourism region

Cancun tourism region should create the following tourism images for advertisement in accordance with the strategy of the tourism region.

- The gateway to the Mayan World,
- A destination with an ideal combination of coral beaches and exotic prehispanic cultures,
- Tropical rain forest.

Mayan culture is more important for the long-haul market than the short-haul market. The image of tropical rain forest would be increasingly important as ecotourism becomes popular.

(2) Target markets of the Cancun tourism region

Cancun tourism regions has potential markets as targets for exploitation as follows:

- Cultural tourists who are interested in archaeology and the indigenous culture but prefer to have a rest and relax after touring the Mayan World,
- People who are interested in diving and underwater scenery,
- Long-weekend tourists from the southeastern part of USA, and
- Convention and incentive tourism.

As the strategy of the tourism region specifies, the long-haul market has relative importance in the Cancun tourism region.

(3) Directions for tourism product development

To realize the strategy of the Cancun tourism region, JICA study team proposes following tourism products

a. Archaeological tourism

Archaeological tourism is the most important tourism products for the Cancun tourism region, playing a role similar to the nature and wildlife tourism in the Los Cabos tourism region, and the Mexican cultural tourism in the Puerto Vallarta tourism region.

The primary products are the Mundo Maya Circuit, which the study team evaluates as one of the best tourism circuits in the world. The circuit primarily focus on Mayan ruins and the existing Mayan cultures but also combine the attractiveness of the nature in the region. The circuit is suitable for all the market segments, but has relative importance in the long-haul market.

Additional travel routes are also proposed for day-trips and for those with short travel itinerary, namely, the Cancún - Tulum - Coba - Chichen Itza route and the Puuc route south of Merida. Kohunlich, Xpjil, Calakmul are the area where archaeological tourism could be combined with ecotourism.

The attractiveness of the ruins are not only the ruins themselves but the combination of ruins, surrounding tropical forest, and indigenous villages. Therefore, proposed projects for improvement of archeological sites need to make careful conservation efforts for these elements.

b. Mexican cultural tourism

There are several towns that maintain colonial heritage, such as Merida, Campeche and Valladolid. They can be supplementary attractions and stopovers along Mundo Maya Circuit. Measures similar to the Mexican cities circuits would apply to improve the attractiveness of the towns, such as promoting the conversion of traditional style buildings to tourist accommodation and facilities, installation of

signs and information centers, introduction of pedestrian precinct, and construction of underground parking for better presentation of historical centers.

c. General interest nature and wildlife tourism

Among major attractions are boat excursions in the Caribbean, such as those to Isla Contoy, coral reefs in Cozumel, and bird (flamingo in particular) watching trips in lagoons such as Rio Lagartos, Celestun, Yum Balam and Sian Ka'an.

Archeological tourism also has an element of nature tourism in the case of visiting less excavated ruins in remote places.

d. Ecotourism

Although accurate distinction from other market segments is difficult, tourism products that should be developed primarily by local participation are discussed in this section. The most important products based on the ecotourism concept would be archeological trekking in tropical rain forest. Projects for this tourism product should include education of local guides, construction of accommodation using local technology and resources, and some improvement of trails.

Additionally, promotion of handicraft production and sales is proposed to distribute tourism benefit to a wider range of people. It could be combined with visits to indigenous villages that produce these items if sufficient social consideration is made.

e. Cruise ship tourism

Cozumel and Playa del Carmen are the ports preferred by Caribbean cruise ships, mostly from Miami. Besides the improvement of port facilities, promotion of "cruise and beach" package may help to increase local economic benefit.

f. Beach resort tourism

Expansion of hotel zones is proposed in Cancún, the Cancun-Tulum corridor, and Costa Maya. One of the most important considerations is to create resort areas that are different from the Cancún hotel zone; more specifically, low-rise and low-density development. The development of the Cancun-Tulum corridor has special importance to realize the alternative concept taking into account its huge development scale. The Costa Maya area and some areas in the Sian Ka'an reserve are sites for ecolodge style beach development.

g. Activities

Various opportunities for sports activities exist in the Cancun tourism region. The most important of these would be diving in Cozumel and Banco Chinchorro. They would attract visitors even from the long-haul market. The latter is proposed as a new destination for diving, which is expected to lessen the congestion in the former.

h. Theme park

"Mayan Village" and an amusement park complex are proposed to diversify the attractions in Cancún. "Mayan Village" is an open-air live museum which displays and enacts the Mayan history and their daily life by locally-hired actors and actresses. It has two objectives. One objective, from a marketing point of view is to inform visitors of the Mayan culture. The other objective, from social consideration, is to protect indigenous villages from mass tourism.

The amusement park complex is comprised of a water park, aquarium, and botanical garden. It targets primarily at the family market, both international and domestic.

i. Convention and incentive tourism

Among the three destinations, Cancún is the most successful example of convention and incentive tourism. It is further enriched by a convention center improvement project and the establishment of a convention bureau

Table 5. 4 Tourism products and tourism areas in the Cancun tourism region

		Cancun	Cozumel Island	Cancun - Tulum corridor	Sian Ka'an Biosphere Reserve	Costa Maya	Chetumal/ Bacalar/ Calderitas	Chetumal - Campeche corridor	Merida - Campeche corridor	Merida - Cancun Corridor
Archaeological tourism			Mayan ruins in Cozumel	Mayan ruins in Tulum etc.	Mayan ruins			Mayan ruins in Kohunlich and the Xp'il area	Mayan ruins in the Puuc area	Archaeological site of Chichen Itza
Mexican cultural tourism	Touring	Mundo Maya circuit						Mayan ruins and jungle trekking	Mayan ruins and jungle trekking	
	Unique towns and villages				Mayan town of Felipe Carrillo Puerto		Bacalar fortress and town	Historical city of Campeche	Historical city of Merida	Historical town of Valladolid
	Tourism - local industry complex			Handicraft sales cooperative	Handicraft sales cooperative			Handicraft sales cooperative	Henequen products	
	Alternative accommodation							Conversion of old mexian houses to tourist accommodation	Conversion of old mexian houses to tourist accommodation	Conversion of old mexian houses to tourist accommodation
	Regional cultural museums	-	-	-	-	-	-	-	-	-
Nature and wildlife tourism	Touring									
	Nature excursion	Mangrove & bird watching cruise in Isla Holbox Boat trip to Holbox/ Contoy		Turtle observation trip	Ecotourism in Sian Ka'an biosphere reserve	Coral reeves in Banco Chinchoro			Mangrove & bird watching cruise in Celestun	Mangrove & bird watching cruise in Rio Laqartos
	Local museum	-	-	-	-	-	-	-	-	-
	Alternative accommodation				Eco-lodge	Eco-lodge		Eco-lodge	Eco-lodge	
Cruise ship tourism			Caribbean cruise	Caribbean cruise						
Resort tourism		Cancun beach resort	Cozumel beach resort	Tulum corridor beach resort	Sian Ka'an resort	Costa Maya beach resort	Chetumal beach resort			
		Isla Mujeres resort								
Activities	Golf Diving	Diving	Diving Golf			Diving Golf				
Theme park		Cancun amusement park complex Mayan Village								
Convention tourism		Cancun Convention Center								

Source : JICA study team

(4) Directions by geographical market segment

Tourism products in the Cancun tourism region are quite competitive in the international tourism market, therefore the long-haul market has the relative importance in the marketing strategy. Archaeological tourism combined with ecotourism will be the most important "value added" for the beach resort tourism in the tourism region.

a. Domestic market

Growth rate of domestic visitor arrivals to Cancun is higher than that of international visitors during the past 5 years. Supposing the precedent of Acapulco would apply to Cancun, domestic market would be increasingly important for Cancun, in particular, for old and therefore less expensive hotels in the Phase I development area.

Cancun is regarded as an exclusive destination in the domestic market, which could be utilized to attract more domestic visitors. Like the case in Los Cabos, introduction of discounted airfares and inexpensive tour packages during the low-season and weekdays would lessen fluctuation of tourism demand and contribute to increase domestic arrivals to Cancun.

It would be worth consideration to introduce discounted entrance fees to archaeological sites for domestic visitors since the fee is quite expensive for average Mexicans.

b. Southbound market (USA & Canada)

Beach and sports activities will continue to be the most important tourism products for the market.

Since Cancun has become too popular for the market, maintaining a favorable destination image is an important issue. Introduction of exclusive resort development in Cancun - Costa Maya Resort Belt would contribute to retain the loyalty of up-market tourists to the Cancun tourism region, while introduction of new tourism facilities in Cancun's hotel zone would stimulate family market.

Mundo Maya Circuit could rival the leading ecotourism destination of Costa Rica in the North American market. It could be achieved by designing tourism resources in the area for ecotourism and by creating an image of ecotourism destination through tourism promotion activities targeted at appropriate segments of the market rather than advertisement toward the general public.

c. Northbound market (Latin America)

Combination of a touring of archeological sites in Mundo Maya Circuit and a stay at a beach in Cancun - Costa Maya Resort Belt would be the most prospective tourism product.

The market, notably the Brazilian market, often combines Cancun with Florida, and regards Cancun as if part of the travel to the USA. Collaboration with Florida would be worth consideration to increase visitors to Cancun in the short-term. The Cancun tourism region, however, should increase awareness of Mundo Maya Circuit to extend the length of stay in Mexico in the long-term.

d. Westbound market (Europe)

Combination of a touring of archeological sites in Mundo Maya Circuit and a stay at a beach in Cancun - Costa Maya Resort Belt would be the most prospective tourism product for the market.

Since the surveys by the JICA study team revealed that the market is not very happy with high-rise hotels as found in the Cancun hotel zone, introduction of more nature-oriented beach development is strongly recommended to develop the market. Like the US market, ecotourism would be prospective for the European market.

Efforts should be made to incorporate ecotourism products into a touring itinerary of Mundo Maya Circuit.

e. Eastbound market (Asia and Pacific)

There are two types of tour itineraries in the market; one is to combine Cancun with a few cities in the USA such as Miami, Orlando, and New York, and another is to make a touring of archaeological sites visiting Mexico City, Oaxaca, and part of Mundo Maya Circuit. The former is popular among the young generation and often chosen for honey moon trip, and the latter is popular among culturally motivated tourists who are generally over 40s.

Although Cancun's popularity has increased in the market, awareness of Mexican tourism products that could be combined with Cancun is still very poor. Although collaboration with Florida would work well to attract visitors to Cancun in the short-term, Mundo Maya Circuit should be more emphasized through tourism promotion activities to extend the length of stay in Mexico in the long-term perspective.

Table 5. 5 summarizes prospect of tourism products in the Cancun tourism region by geographical market segment.

Table 5. 5 Prospect of tourism products by regional market segments

	Domestic	Southbound (North America)	Northbound (Latin America)	Westbound (Europe)	Eastbound (Asia)
Archaeological tourism	⊙	⊙	⊙	⊙	⊙
Cultural Tourism	○	○	○	○	○
Unique towns & villages	○	○	○	○	○
Tourism local industry complex		○		○	○
Alternative accommodation		○		○	○
Regional museums	-	-	-	-	-
Nature and Wildlife					
Touring of nature sites	-	-	-	-	-
Nature excursion	○	○	○	○	○
Ecology museum	-	-	-	-	-
Alternative accommodation	○	○	○	○	○
Cruise ship tourism	○	⊙	⊙	⊙	○
Resort tourism	⊙	⊙	⊙	⊙	⊙
Activities	⊙	⊙	○	○	○
Theme park	⊙	⊙	○	○	○
Convention/Incentive	⊙	⊙	○	○	○
Ecotourism		○		○	○

Source: JICA study team

5.3.4. Development framework

The development framework of visitors (both domestic and international) to the tourism region, and the number of required hotel rooms for the tourism region in each phase are shown in Table 5. 6. The hotel rooms are only for the star hotels, not including non-star hotels, condominiums and other types of accommodations such as camping facilities, mobile houses, and tourism villas.

The framework is distributed to the states from the framework of the national level framework as discussed in Volume 2.

Table 5. 6 Development framework of the Cancun tourism region

Tourism Destinations	Hotel Arrivals (x1,000)										Hotel rooms				
	Domestic					International					1995	2000	2002	2005	2010
	1995	2000	2002	2005	2010	1995	2000	2002	2005	2010					
Cancun	489	546	576	621	734	1,666	1,788	1,845	1,929	2,148	18,891	20,150	20,838	21,870	24,557
	1.00	1.12	1.18	1.27	1.50	1.00	1.07	1.11	1.16	1.29	1.00	1.07	1.10	1.16	1.30
Cozumel	67	80	86	97	123	243	297	326	370	480	3,332	3,882	4,206	4,693	5,906
	1.00	1.19	1.29	1.45	1.84	1.00	1.22	1.34	1.52	1.97	1.00	1.17	1.26	1.41	1.77
Tulum Corridor	7	62	95	143	263	108	358	503	719	1,259	1,515	4,083	5,637	7,968	13,878
	1.00	8.90	13.51	20.42	37.59	1.00	3.31	4.65	6.65	11.64	1.00	2.69	3.72	5.26	9.16
Costa Maya	n.a.	16	19	25	43	n.a.	49	61	80	147	10	543	694	920	1,764
	n.a.	1.00	1.22	1.54	2.69	n.a.	1.00	1.26	1.64	3.02	1.00	54.30	69.36	91.95	176.35
Others	n.a.	39	61	93	161	n.a.	78	112	163	254	1,350	1,782	2,246	2,942	4,292
	n.a.	1.00	1.54	2.35	4.10	n.a.	1.00	1.44	2.10	3.26	1.00	1.32	1.66	2.18	3.18
Total of Quintana Roo State	589	744	837	977	1,324	2,113	2,570	2,847	3,262	4,286	25,098	30,440	33,620	38,392	50,397
	n.a.	1.00	1.13	1.31	1.78	n.a.	1.00	1.11	1.27	1.67	1.00	1.21	1.34	1.53	2.01

Source: SECTUR, Jalisco state, JICA study team

5.4. Tourism development and promotion plans

Following plans and programs are required to realize the strategy of the tourism region as discussed in the previous section.

5.4.1. Tourism policy and administration

This section proposes institutional and organizational programs necessary to support and realize the strategy of the tourism region.

(1) Introduction of development guidelines to, and promotion of nature-oriented development in, Cancun - Costa Maya Resort Belt

Cancun - Costa Maya Resort Belt should be developed as a beach resort area that is more low-density, nature-oriented, and physically unobtrusive than Cancun's hotel zone. Introduction of development guidelines, publicizing of the alternative development concept and knowhow, and investment promotion for nature-based tourism should be implemented to induce the alternative type of tourism development.

(2) Inter-state coordination system for the Cancun tourism region

The strategy of the Cancun tourism region stresses the importance to attract visitors from the long-haul market. Since visitors from the long-haul market generally travel a wider area than state, tourism regions are set to cover the area of one-week touring circuit. Hence, it is necessary to establish a tourism administration system that covers the Cancun tourism region which covers Mexican part of Mundo Maya Circuit.

For promotion of the international long-haul market, related organizations in Quintana Roo, including Cancun, should implement joint promotional activities with neighboring states by combining their tourism products available in wider areas. The regions covered by this joint promotion would be the north part of the Yucatan Peninsula such as Campeche and Yucatan. For the purpose of implementing necessary activities, tourism related organizations in those states should establish an association for the tourism promotion consisting of members from municipal, state, Fondo Mixto and related private sectors.

a. Inter-state coordination body for tourism administration

It is necessary to establish an organization for coordination of tourism administration of the Cancun tourism region. to transform the tourism region into a single integrated tourism destination.

b. Inter-state coordination system for tourism promotion

SECTUR should take the initiative to establish an organization for coordination among Fondos Mixtos in the tourism region to facilitate effective tourism promotion toward the long-haul market.

(3) Multi-country cooperation

Since Mundo Maya covers Mexico and its neighboring countries of Guatemala, El Salvador, Honduras, and Belize, there is a need to establish a system that facilitate cooperation among these countries for tourism development and promotion.

Visitors from long-haul areas often combine Cancun with Florida; shopping in Miami and theme parks in Orlando. It could be possible to launch a joint campaign of two destinations.

(4) Visitors survey at airports

Proposed organization for the coordination of tourism promotion should conduct periodical visitor survey at major airports in the region to investigate visitors' profile, satisfaction level, and influence of tourism promotion activities. The survey aims to obtain basic data for marketing and tourism planning, to improve services

levels, in particular, those of hotels and airports, and to evaluate the effectiveness of tourism promotion activities.

(5) Financial assistance system for tourism SMEs

An organization responsible for financial and institutional support for tourism SMEs is recommended to establish in Cancun tourism region to encourage local participation in tourism. The organization does not only help SMEs to obtain financial support from FONATUR but, if possible, have its own fund for direct assistance to SMEs including ecotourism enterprises.

(6) Training system for ecotourism

There are so many nature sites such as Celsetum, Rio Lagartos, Isla Holbox, Sian Ka'an and Banco Chinchorro that are suitable for ecotourism. A training system that spreads the concept and knowhow of ecotourism should be introduced by respective state government in the tourism region. The Campeche state has the system, and other states should introduce similar systems.

The training, in principle, should be provided for residents living near archaeological and nature sites to increase local benefit from tourism.

(7) Establishment of a convention bureau

Although the tourism department of the Quintana Roo state has a section to promote convention tourism, a convention bureau should be established in Cancun to enhance the function to promote convention and incentive tourism.

The convention bureau should be a joint venture of the public and the private sectors and could operate on a membership system. The members of the convention bureau should be from the municipality, the state government, and private sector enterprises that would benefit from convention, seminars, and incentive travel such as the travel trade, transportation companies, advertizing agencies, and printing businesses.

5.4.2. Recommendations to improve reception services

The following aspects on reception services need to be improved for effective and efficient tourism promotion in the tourism region.

(1) Improvement of tourist information centers

Although there are many tourist information centers in the tourism region operated by states and local governments, they can not provide tourism information on areas outside of their jurisdiction. It is recommended that these tourist information centers should exchange tourism information each other to provide information on other areas of the tourism region. Coordination among related states and municipalities are necessary to realize "well-connected" tourist offices.

(2) Improvement of hotel services in Cancun

JICA study team encountered the following services problems in Cancun:

- Slow check-in and check-out procedures at reception desk,
- Poor maintenance of hotel facilities, and
- Unreliable services of laundry etc.

These problems are supposed to come from poor management of hotels and lack of appropriate education for hotel employees. It is necessary to conduct periodical customer satisfaction surveys to feed back their opinions to hoteliers to make them realize the necessity to make more investment to improve services.

Measures to improvement of tourism education system are discussed in Volume 2; National Strategy.

(3) Lack of signs and interpretation boards at tourism sites

Many archaeological and nature sites lack in signs and interpretation boards for both domestic and international visitors. For examples, Chicana, Xpujil and Edzna ruins do not have an entrance sign. Signs and interpretation boards writtern at least in Spanish and English should be installed at all the archaeological and nature sites.

Besides, most ruins in the tourism region does not have site museum except Chichen Itza. Site museums should be built for major archaeological sites for better appreciation of the tourism products.

(4) Insufficient public transportation system for FIT travelers

Public transportation between archaeological sites and major gateway cities such as Cancun, Merida, Campeche and Chetumal is poor and needs improvement. Besides, information on regional public transportation are poorly provided. These issues should be solved for the further growth of tourism in the tourism region.

5.4.3. Tourism promotion plan

In accordance with the strategy of the tourism region, the Cancun tourism region should put emphasis of the long-haul market.

Table 5. 7 in the following page summarizes recommended sales promotion measures for tourism products in the region. The key tourism products are emphasized by shade based on the development strategy of the region. Following section add a few consideration for tourism promotion to supplement the table.

Special campaign: "Visit Mundo Maya Year"

Besides the activities listed in the table, it is recommended to conduct "Visit Mundo Maya Year" at an interval of about 5 years in cooperation with the related states, municipalities, Fondo Mixto and private sector enterprises.

Multi-country tourism promotion

Since Mundo Maya covers the territories of Mexico, Guatemala, El Salvador, Honduras, and Belize, coordination among the countries would be important to conduct tourism promotion activities.

Table 5. 8 shows the specification of respective tourism promotion activities based on Table 5. 7.

Table 5.7 Tourism products and appropriate sales promotion measures

Tourism Product & Resource	Archaeological tourism	Mexican cultural tourism					Nature and Wildlife Tourism				Cruise ship tourism	Resort tourism	Activities	Theme park	Convention/Incentive	Ecotourism
		Touring	Unique towns & villages	Tourism local industry complex	Alternative accommodation	Regional cultural museums	Touring	Nature excursion	Ecology museum	Alternative accommodation						
Promotion Method																
Brochure, Map & Poster	⊙	○	○			-	-	○	-	○	⊙	⊙	⊙	⊙	○	○
Manual for travel trade (Publication)	⊙	○	○			-	-	○	-	○	⊙	⊙	⊙	⊙	⊙	○
Production of graphic media (video)	⊙		○	○	○	-	-	○	-	○	⊙	⊙	⊙	⊙	○	
AD. on TV & Radio	⊙					-	-		-		⊙	⊙	○	⊙		
AD. in newspaper & magazine	⊙					-	-		-		⊙	⊙	○	⊙		
AD. in special interest group's publication	⊙		○	○	⊙	-	-	⊙	-	⊙	○		⊙		○	⊙
Cooperation to journal	⊙		○	○	○	-	-	⊙	-	⊙	⊙	⊙	⊙	⊙	○	⊙
Familiarization trip for media & travel trade	⊙		○	○	○	-	-	○	-	○	⊙	⊙	○	⊙	⊙	○
Press Release	⊙		○	○	○	-	-	⊙	-	⊙	⊙	⊙	⊙	⊙	○	⊙
Cooperation to shooting crews of TV	⊙		⊙		⊙	-	-	⊙	-	⊙	⊙	⊙	○	○		○
Seminar for travel trade	⊙		○	○	○	-	-	○	-	○	⊙	⊙	⊙	⊙	⊙	○
Participation in travel trade show	⊙		○		⊙	-	-		-	○	⊙	⊙	⊙	⊙	⊙	
Participation in tourism mission	⊙		○		○	-	-		-	○	⊙	⊙	⊙	○	⊙	○
Joint Campaign with travel trade	⊙		○			-	-		-		⊙	⊙	⊙	⊙		
Organization of travel trade show	⊙		⊙	○	⊙	-	-	○	-	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Travel week	⊙		○	⊙		-	-	○	-		○	⊙	⊙	○		○
Approach to special interest group	⊙		○	○	⊙	-	-	⊙	-	⊙	○		⊙			⊙

Note: ⊙=very prospective, ○=prospective, blank=not prospective, - = not available

Source: JICA study team

Table 5. 8 Specification of tourism promotion projects in the Cancun tourism region

Project Name	Detailed Outkue	Target markets	Intervals
Production of promotional tool			
Image-oriented brochure	5 language-versions/total 150,000copies per production	Almost all markets	Every 2 years
Information-oriented brochure	5 language-versions/total 150,000copies per production	(ditto)	(ditto)
Poster	3 kinds/20,000 copies each	(ditto)	(ditto)
Map	Incl. city map/ Spanish : 60,000 copies per production, English : 240,000 copies	Almost all markets	(ditto)
Manual for travel trade	Spanishi&English/15,000 copies per production	North Ameirca & Domestic	(ditto)
Graphic Media (1)	VIDEO, 20 minutes/5 language versions	(ditto)	(ditto)
Graphic Media (2)	Color Slides, CD-ROM, etc.	All markets	Every year
Advertisement			
TV	3 places in Mex. & 3 places in North America	North America & Domestic	60 times per year
Radio	5 places in Mex. & 3 places in N. America	(ditto)	Every day except Sat. & Sun.
Newspaper (1)	5 markets regions	Domestic	30 times per year
Newspaper (2)	3 places	North America	18 times per year
Magazines (1)	5 media	Domestic	20 times per year
Magazines (2)	5 media	North America	12 times per year
PR activity			
Cooperation to Journalist	Comunicaton charges, etc.	All markets	Every year
Familiarization trip		(ditto)	168 persons per year
Press Release		(ditto)	Every year
Cooperation to Shooting Crews		(ditto)	4 cases per year
Approach to trade sector			
Seminar/Presentation	Including participation in Tourism Mission organized by SECTUR	(ditto)	25 times per year
Familiarization trip for trade sector		International	120 pesons per year
Travel trade show	Including participation in Tourism Mission organized by SECTUR / Participation in Travel	All market	17 times per year
Joint Campaign		(ditto)	10 cases per year
Travel Trade Mart (organizing)	Organization of Travel Trade Mart	(ditto)	Every year except
Approach to Consumers			
Travel Week	3 places in North America/ 2 places in Asia & Europe	North America, Europe & Asia	(ditto)
Approach to special interst group	Charge for communication & travel expenses	(ditto)	Every year
Campaign and Events			
Photo contest	Handling of applied photos & purchase of prizes,etc.	All markets	Every year
Institutional programs			
Visit Year	Subsidies for beautification of towns and scale up of festivals and events (4 places)	All markets	Every 5 year

Source: JICA study team

5.4.4. Recommendations for sustainable tourism

(1) Tourism development, urbanization and pollution in tourism destinations

a. Plan and reality of Cancun's tourism complex development

The physical plan of Cancun's tourism complex development was made and implemented by FONATUR. The plan of Cancun paid relatively much attention to the environment in the tourism development complex. The plan physically separated a zone for hotel and a zone for supporting town, as shown in Figure 5. 10. Not only roads, electricity and water supply, but also waste water treatment plants were well planned. The plan also prepared a zone for the supporting town to accommodate residential areas for workers and their families and other urban functions.

However, the reality of Cancun's tourism complex went beyond the scale and speed of hotel construction and population increase that the original plan foresee. The hotel zone was constructed on banks of coral reef enclosing lagoons. The construction of the hotel zone began in the middle of 1970s by laying earth on the banks of coral reef for raising the ground level and expanding land areas. This hindered water exchange between the sea and lagoons, partly causing deterioration of water quality of the lagoons.

Although the supporting town was constructed according to the original plan, the plan underestimated the number of urban population which supports and is attracted by the tourism industry at the time when the hotel zone is fully occupied. At present, the planned supporting town turns to be a downtown of Cancun, and urban areas have expanded toward the west and north, absorbing increasing population.

Moreover, the original plan did not consider the growth of tourist facilities in Cancun's downtown, which now have almost 2,000 hotel rooms and about 1,500 tourist suites. In addition, restaurants and souvenir shops simultaneously grown in the downtown.

Table 5. 9 Distribution of hotels and population in Cancun and Tulum Corridor

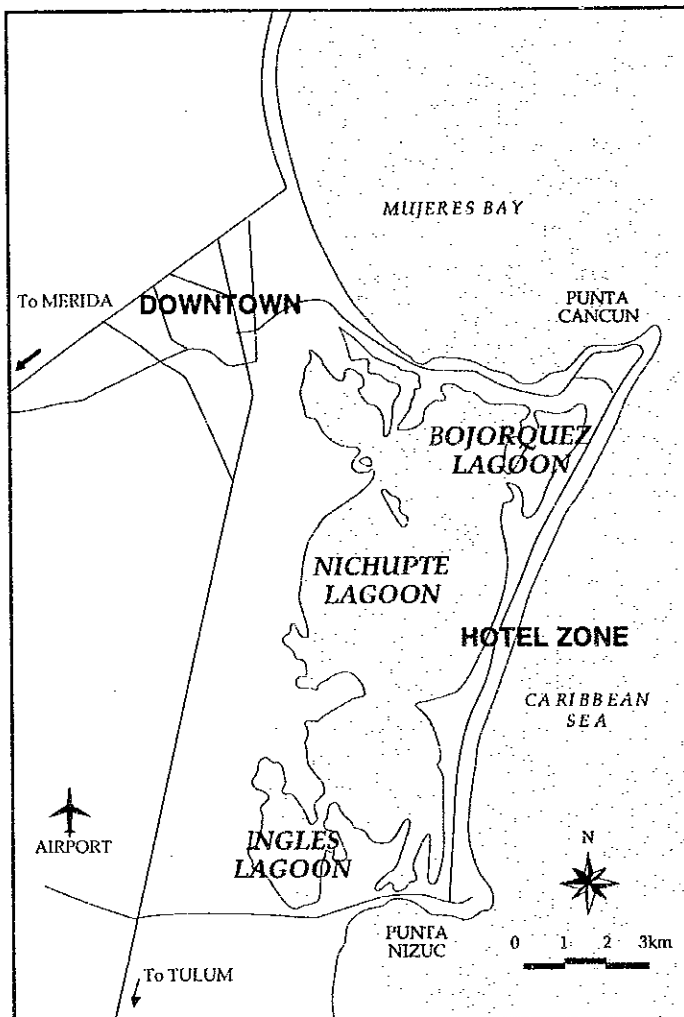
	No. of Hotel Rooms *	Population **
Cancun Downtown	2,000	167,700 (310,000***)
Cancun Hotel Zone	19,240	-
Isla Mujeres	630	10,700
Isla Cozumel	3,900	33,900
Playa del Carmen	820	3,100

Source: * Sistema Nacional de Informacion Turistica al 25 de 1995, and various estimates

** INEGI's Population Census in 1990

*** 1994's Population from Municipality

Figure 5.101 Cancun hotel zone and town area



Source: JICA study team

b. Rapid urbanization and needs for sewage system in Cancun town area

The urban population and tourist facilities in town areas demand urban services, such as electricity, water, garbage collection, sewage systems, medical services, and school education. Since the end of construction, separated from FONATUR, the supporting town area has been administered by a municipal government. Cancun city (Benito Juarez Municipality) has experienced financial and administrative difficulties to deliver adequate levels of urban services to increasing population.

The rapid population increase in the recent years was amazing. In 1990, Cancun (Benito Juarez Municipality) had about 180,000 population, but in 1994 it increased to 310,000. The urban areas are now expanding to the north and to the south. The local governments have been always behind the increasing demand for residential land and basic urban services, such as water supply and sewage system. The increased population have had difficulties to find settlement areas with proper urban services.

At present, there are 5 sewage treatment facilities serving the Cancun town area. However, the existing sewage collection and treatment system covers only part of Cancun town area as shown in , and serves the population of 114,000 (only 35 % of the total urban population).

Table 5. 10 Sewage treatment facilities in the Cancun town area

Location	Installed Capacity (liter per second)	Treated Waste Water (liter per second)	Efficiency (%)
Caribe 2000	150	70	90
Laguna de Oxidacion	200	220	110
Paraiso	8	4	90
Corales	50	20	10
FOVISSSTE	2	Not Operating	
Total	410	314	76

Source; Saneamiento Integral de Cancun, Q. Roo, CNA

According to a study, the present urban population demands the treatment of more than 1,000 liters/sec of sewage, but the existing capacity of the downtown sewage treatment plants is only 410 liters/sec. This situation causes sanitary problems in residential areas. However, fortunately to the hotel industry in Cancun, but unfortunately to the local population, the deteriorating residential environment does not harm directly the beaches of the hotel zone, because, as mentioned earlier, the hotel zone is clearly separated from the town area. However, the untreated waste water from urban households pollute ground water, which might flow into Nichupte lagoon, as discussed in the next section.

c. Sewage treatment plants in the Cancun hotel zone

The hotel zone of Cancun has three sewage treatment plants, which are supposed to have enough capacity for the sewage from the hotel. However, the sewage treatment plant at Gucumatz has, at present, only half of the installed capacity of treatment due to poor maintenance. So part of the sewage for Gucumatz is sent to the plant at El Rey. Moreover, the treated sewage is designed to be discharged below 120 m from the sea level in wells. However, in actuality, discharging pipes have some problems to allow leakage of treated sewage to only 80 m deep from the sea level. It is considered that such leaked water goes to the lagoons, rather than to the sea.

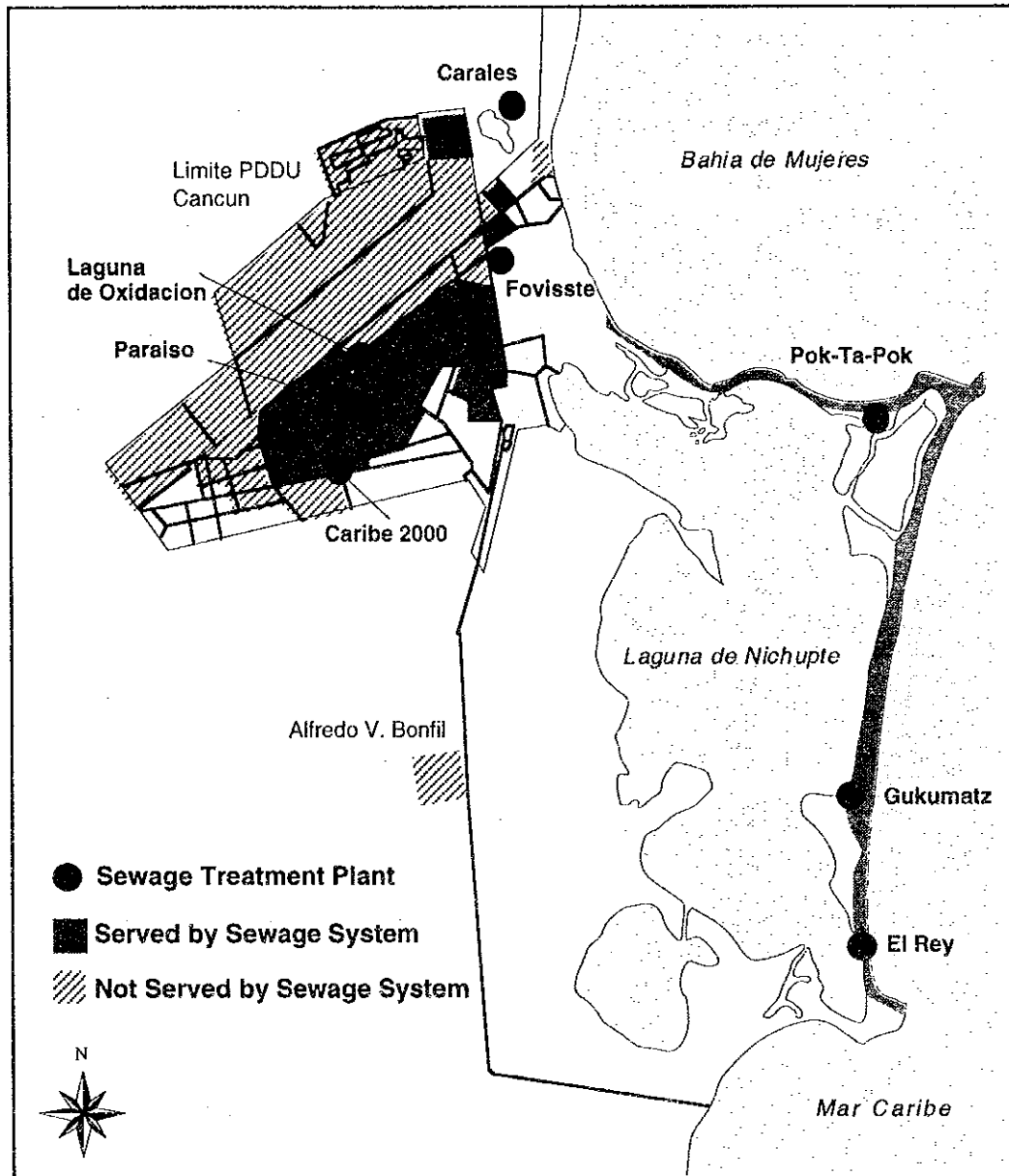
Since FONATUR has been busy in developing lands and facilities for hotels, it has not well taken care of operation and maintenance of the sewage treatment plants, which are technically operated by a subsidiary company of FONATUR. Now, the Gucumatz's plan is under repair for full utilization of the installed capacity.

Table 5. 11 Sewage treatment plants in the Cancun hotel zone

Location	Installed capacity (liter per second)	Treated waste water (liter per second)	Efficiency (%)
Pok-Ta-Pok	245	160	65
Gucumatz	200	120	60
El Rey	100	45	45
Total	545	325	60

Source; Saneamiento Integral de Cancun, Q. Roo, CNA

Figure 5. 112 Sewage services coverage and sewage treatment plants



Source: JICA study team

d. Water pollution of Nichupte lagoon system in Cancun

An environmental committee on Nichupte Lagoon System is comprised of members of local governments, hotels, other tourism industry, environmental groups and citizens. It has been active mostly in matters on further development of hotels and restaurants in the hotel zone for years. The ecological ordinance of Nichupte Lagoon System established in 1994 provides the guideline which governs their decisions on further development in the hotel zone.

According to a study by CNA in 1992, the water quality of Nichupte Lagoon is adequate for recreational use and direct contact with the water. However, Nitrogen, ammonia and phosphorus's levels exceeded certain criteria, which means that the lagoon water did not provide healthy conditions for aquatic lives. The study results suggest that the contamination was caused domestic waste water from washing and kitchens. However, the degree of contamination was not so significant at that time.

Since then a local branch office of CNA conducted environment monitoring of the lagoon water. In 1995 according to the monitoring result, the lagoon water pollution reached serious levels, so that local governments, environmental groups, citizens, hotel business and other tourism sectors started to feel needs of concerted efforts. Responding to these situations, in April 1996, the environmental committee on the Nichupte Lagoon System formulated an integrated action plan for environmental improvement of the lagoon system, whose implementing costs amount to 850 million peso. The plan was proposed to the federal government for budget allocation. CNA responded to the proposal of the action plan, and started scientific and technical studies to find out causes of lagoon water pollution.

The possible causes of lagoon water pollution are various as follows:

- Discharging not fully treated waste water by waste water treatment plants in the hotel zone,
- Seeping of polluted water from the garbage dump site adjacent to Nichupte lagoon into the ground water, partly flowing into the lagoon,
- Untreated waste water from urban houses of Cancun town area thorough the ground water flow,
- Inflow of water from the rainwater drains in the hotel zone, and
- Oil leakage from motorized boats using the lagoons

e. Sewage treatment systems of supporting towns in Cancun-Tulum Corridor

In the Cancun-Tulum Corridor, there are three important supporting towns: Puerto Morelos, Playa Del Carmen, and Tulum. Among these Playa Del Carmen is the largest, which has accumulated hotel rooms (820 rooms) and residential population (3,100).

These supporting towns provide places for not so deluxe hotels, other tourist facilities and service functions, as well as workers and their families. This accumulation of tourist facilities and residential population, which require increasingly urban services, such as water supply, electricity, sewage collection and treatment, and garbage collection and disposal. Moreover, such urban services become more important for sustaining the quality of tourism destinations in the near future, especially in Playa Del Carmen and Tulum.

(2) Increased awareness on remaining natural environment

a. Tourism development and disappearance of natural environment

In the last two decades, most of Mexican tourism destinations have lost large part of their rich natural environment. Beaches are surrounded by hotels and condominiums. You can find artificial tourist facilities everywhere you go. Having experienced these changes in their home towns, local people feel more directly disappearance of nature in their surroundings. At the same time, global environmental issues must have impressed dangerous situations of environment. These factors have made local people become aware of precious values of even minor natural elements, such as deteriorated mangrove trees, minor estuary, and smelling lagoons.

b. Increased awareness on remaining natural environments in Cancun and its surrounding areas

In the last just 10 years, modern buildings for hotels and condominiums covered Cancun's beach front. On the other hand, the town area also expanded explosively, due to 200 % increase of residential population from 1985 to 1994.

This huge tourism development and rapid urbanization reduced natural things and processes in the environment of Cancun. Only remaining are a lagoon system of Nichupte and mangroves. Responding to the decreasing natural elements, an

environmental committee on Nichupte Lagoon System has attracted various members who are concerned with environment. In 1994, an ecological ordinance for Nichupte Lagoon was established in coordination of FONATUR, SEDESOL, State and Municipality governments. Moreover, in the late 1995 local governments, environmental groups and researchers had a conference to consider environmental conservation of the lagoons.

Furthermore, based on initiatives from business and local communities, the federal and local governments some areas around Cancun's hotel zone, such as Punta Cancun, Punta Nizuc and Isla Mujeres, were designated as natural reserve areas. In these various ways, people started to try to take care of remaining natural environment.

(3) Environmental strategies for Cancun and the Cancun tourism region

We recommend the following two priority actions:

- Urgent implementation of Integrated Environmental Action Plan for Nichupte Lagoon (The project profile of this action plan is given in recommended action plans.)
- Strict enforcement of the Ecological Ordinance of Cancun Tulum Corridor and the Ecological Ordinance of Costa Maya

a. Urgent implementation of integrated environmental action plan for Nichupte Lagoon

We set a high valuation on the tourism development potential of Cancun Tourism Region, covering Small Mundo Maya Circuit in Quintana Roo, Merida and Campeche. This region is famous and appealing not only by Maya archeological ruins, but also by Cancun's beach resort. Cancun is also the gateway for the Cancun Tourism Region.

In order to embark on exploitation of the huge potential of Cancun Tourism Region, it is inevitable to sustain the quality of Cancun itself as an internationally famous tourist destination. If Cancun becomes another polluted "Acapulco", the Cancun Tourism Region would lose chances to take off as an international tourist destination with diversified attraction. It is important to learn lessons from Acapulco's experiences that beach water polluted by garbage and sewage destroyed images of attractive and clean tourist beach resorts, and that it is hard to recover its reputation.

In this sense, it is necessary to put high priority on preventing further deterioration of water quality of the Nichupte Lagoon System, by improving and expanding sewage collection and treatment system covering both Cancun's town area and hotel zone. However, most areas without sewage services do not have water supply services, either. So the efforts at environmental management of the Nichupte Lagoon System should start with water supply.

b. Strict enforcement of the ecological ordinance of the Cancun-Tulum corridor and Costa Maya

Responding to the very artificial and huge development styles of the Cancun tourism complex, there are increasing consensus among the tourism business sector and local governments desiring that development styles of Cancun-Tulum Corridor and Costa Maya Corridor should be more

The ecological ordinance for Cancun-Tulum Corridor was established. The ecological ordinance for Costa Maya is almost established but does not yet hold good. Both ecological ordinances emphasize low density and balanced development with natural environment. However, the most important points are strict enforcement of the ordinances and advanced guidance of tourism facility development.

5.5. Tourism development and promotion projects

5.5.1. Action plan

Since the target year of action plan is set at the year 2002, selected projects constituting the action plan are to be implemented in the short term (1996-2000) and in the medium term (2001-2005).

(1) Tourism development projects

Action projects are chosen from the following criteria:

- Contribution to develop new tourism product(s) and attraction(s)
- Contribution to revitalize the beach center of Cancun
- Contribution to conserve natural and social environment and tourism resources,
- Contribution to formulate tourism network of Cancun- Costa Maya Resort Belt and Mundo Maya Circuit.

According to the above criteria, the following projects are chosen as action projects in the Cancun tourism region:

- 1) Laguna Nichupte environmental improvement (CTR CUN-6)
- 2) Improvement of Federal Highway No. 307 between Cancun and Chetumal (CTR CTC-3)
- 3) Road improvement of the section of Tulum-Coba-Autopista No.180 (CTR CTC-4)
- 4) Nature conservation and tourism amenity improvement of Yum Balam Biosphere Reserve (CTR CUN-8)
- 5) Nature conservation and tourism amenity improvement of Banco Chinchorro (CTR CSM-1)
- 6) Ecotourism development in Kohunlich archeological sites (CTR CCQ-1 (1))
- 7) Community-based ecotourism development in Xpjl archeological sites (CTR CCC-1)
- 8) Infrastructure development for Costa Maya resort (CTR CSM-3 (2))

(2) Tourism promotion projects

All projects listed in Table 5. 8 should be implemented as an action project.

(3) Institutional and organization programs

Following programs should be implemented as action projects.

- 1) Introduction of development guidelines to, and promotion of nature-oriented development in, Cancun - Costa Maya Resort Belt,
- 2) Establishment of an inter-state organization for coordination of tourism administration,
- 3) Establishment of an inter-state organization for coordination of sale promotion,
- 4) Periodical visitor surveys at airports,
- 5) Introduction of the financial assistance system for tourism SMEs,
- 6) Establishment of a convention bureau, and
- 7) Training system for ecotourism.

Table 5. 12 summarizes the cost of action projects.

Table 5.12 Cost of action projects

Action projects	Unit	Cost (1,000)			
		Total	Central Gov.	State/ City	Private
Laguna Nichupte comprehensive environmental improvement (CTR CUN-6)	Peso US\$	853,100 113,747	853,100		
Improvement of Federal Highway No. 307 between Cancun and Chetumal (CTR CTC-3)	Peso US\$	1,900,000 253,333	1,900,000		
Road improvement of the section of Tulum-Coba-Autopista No.180 (CTR CTC)	Peso US\$	86,300 11,507	86,300		
Nature conservation and tourism amenity improvement of Yum Balam Biosphere Reserve (CTR CUN-8)	Peso US\$	4,000 533		4,000	
Nature conservation and tourism amenity improvement of Banco Chinchorro (CTR CSM-1)	Peso US\$	32,500 4,333	22,500	10,000	
Ecotourism development in Kohunlich archeological site (CTR CCQ-1 (1))	Peso US\$	70,750 9,433	28,350	29,200	13,200
Community-based ecotourism development in Xpjiil archeological site ()(Canpeche state)	Peso US\$	80,594 10,746		80,594	
Infrastructure development for Costa Maya resort (CTR CSM-3 (2))	Peso US\$	170,800 22,773		170,800	
Total	Peso US\$	3,198,044 426,406	2,890,250 385,367	294,594 39,279	13,200 1,760

Source: JICA study team

(4) Profile of action plan projects and its IEE form

The following pages shows the profile of each action plan project but limited in the development project and its result of Initial Environmental Evaluation (IEE).

Name of Project:	Laguna Nichupte environmental improvement
Project code:	CTR CUN-6 (AP CTR-1)
Location:	Benito Juarez Municipality area, Quintana Roo
Objectives:	<ul style="list-style-type: none"> - To pursue sustainable development of Cancun as an international-class tourism center, which is also a gateway to the states of Quintana Roo, Merida, and Campeche. - To improve not only the quality of urban residential areas of Cancun, but also the tourism environment of Cancun.
Rationale and scope:	<p>Cancun is faced with problems of sustainability in terms of environment and tourism amenity. The further tourism development potential could be threatened by the water pollution of Nichupte lagoon, like Acapulco bay's water pollution.</p> <p>Since the number of hotel rooms in the Cancun hotel zone increased very rapidly in the last 10 years, the urban population of Cancun also increased dramatically. Both of these resulted in rapid increases of demands for sewage treatment. In the hotel zone, the poorly treated sewage might go into the lagoons due to malfunction of the system. In the Cancun's town area, only 35% of population are served by the existing sewage system. These sewage problems are possible polluting factors of the Nichupte Lagoon system together with poor garbage disposal and oil leakage from recreational boats.</p> <p>The following components of the project should be implemented very urgently:</p> <ol style="list-style-type: none"> 1) Comprehensive study of sewage systems and environment of the Nichupte lagoon system. 2) Improvement and development of water supply and sewage system 3) Solid waste disposal system improvement 4) Establishment of regulations 5) Environmental conservation and restoration 6) Lagoon environmental improvement 7) Environmental information system development
Executing body:	FONATUR, Comision Nacional del Agua (CNA), Quintana Roo state, Benito Juarez municipality
Private sector participation:	
Schedule:	To be implemented by 2002
Related projects:	CTR CUN-4 (related to that the project of Malecon Cancun requires careful environmental assessment on the Nichupte lagoon)
Project cost:	\$ 853,100,000, (US\$ 113,747,000)
Financial sources:	Federal government and soft loans from foreign governments.
Implementation arrangements:	In April 1996, the environmental committee on the Nichupte Lagoon System formulated an integrated action plan for improvement of the lagoon system. CNA/IMTA has started scientific and technical studies to find out causes of lagoon water pollution. Based on the CNA/IMTA study, serious actions have to be taken for the problem. It is highly recommended to utilize soft loans for implementing the project.
Environmental consideration:	See IEE result.

No CTR CUN-6 Laguna Nichupte comprehensive environmental improvement

Scoping	Site Description														
	Before operation					After operation					Social Environment				
	Reclamation and Spatial Occupancy	Operation of Construction Equipment	Spatial Occupancy	Operation of Vehicles	Operation of Trains/Airplanes/Ships	Operation of Facilities	Accumulation of People and Goods	Inhabitants	Land Use	Urban	Urban/tourism	Economy/Transport	Tourism, commerce and services		
1 Resettlement															
2 Economic activity															
3 Traffic and public facilities															
4 Split of communities															
5 Cultural property															
6 Water rights/Rights of common															
7 Public health condition															
8 Waste				▲											
9 Hazards(Risk)	▲														
10 Topography and geology															
11 Soil erosion															
12 Ground water	▲	●													
13 Hydrological situation	▲	●													
14 Coastal zone	▲	●													
15 Fauna and flora	▲	●		▲											
16 Meteorology															
17 Landscape	▲	▲													
18 Air pollution	▲	▲		▲											
19 Water pollution	▲														
20 Soil contamination															
21 Noise and Vibration		▲		▲											
22 Land subsidence															
23 Offensive odor															

Note: ●: The environmental items to which special attention has to be paid. They might cause serious impacts that may affect the project formulation depending on the magnitude of the impacts and the possibility of the measure. ▲: The environment items which may give a significant impact depending on the scale of project and site conditions.
 No mark: The environmental items which require no important assessment since the anticipated impacts are not significant in general.

Name of Project:	Improvement of Federal Highway No. 307 between Cancun and Chetumal
Project code:	CTR CTC-3 (AP CTR-2)
Location:	Cancun-Tulum-Chetumal, Quintana Roo
Objectives:	<ul style="list-style-type: none"> - To encourage regional development of the Cancun-Tulum-Chetumal corridor - To integrate the northern part and the southern part of Quintana Roo. - To improve the mobility for regional tours covering Mundo Maya
Rationale and scope:	<p>In order to sustain and to expand tourism development of Cancun and its surrounding areas, it is necessary to integrate beach resorts and a regional touring circuit covering Mayan archeological ruins and other nature attractions. For this purpose, it is required to enable high-speed mobility between major centers, such as Cancun, Tulum, Chetumal, Campeche, and Merida.</p> <p>The high priority of road improvement should be given to the corridor between Cancun and Tulum, not only to induce beach resort development of the Cancun-Tulum corridor, but also to speed up more than 300 km travel between Cancun and Chetumal. The existing two-lane road should be widened to four lanes (A4 type of Mexican standard).</p> <ul style="list-style-type: none"> - Cancun-Playa del Carmen-Tulum (48 km) - Playa del Carmen-Tulum (61 km) - Tulum-Chetumal (207 km)
Executing body:	Secretary of Communications and Transport (SCT)
Private sector participation:	
Schedule:	To be implemented by 2002
Related projects:	CTR CTC-4 (AP CTR-3)
Project cost:	\$ 1,900,000,000 (US\$ 253,330,000)
Financial sources:	State government (SCT)
Implementation arrangements:	SCT has a plan to complete the road improvement by the year 2000.
Environmental consideration:	See IEE form.

No CTR CTC-3 Improvement of Federal Highway No. 307 between Cancun and Chetumal

Scoping	Site Description											
	Before operation					After operation					Social Environment	
	Spatial Occupancy and Reclamation	Spatial Occupancy	Operation of Vehicles	Operation of Trains/Airplanes/Ships	Operation of Facilities	Accumulation of People and Goods	Inhabitants	Land Use	Economy/Transport	Low population density		
1 Resettlement												
2 Economic activity												
3 Traffic and public facilities												
4 Split of communities												
5 Cultural property												
6 Water rights/Rights of common												
7 Public health condition												
8 Waste												
9 Hazards(Risk)												
10 Topography and geology	▲	▲										
11 Soil erosion	▲	▲										
12 Ground water												
13 Hydrological situation	▲	▲										
14 Coastal zone												
15 Fauna and flora	▲	▲										
16 Meteorology												
17 Landscape	▲	▲										
18 Air pollution												
19 Water pollution	▲	▲										
20 Soil contamination												
21 Noise and Vibration												
22 Land subsidence												
23 Offensive odor												

Note: ●: The environmental items to which special attention has to be paid. They might cause serious impacts that may affect the project formulation depending on the magnitude of the impacts and the possibility of the measure. ▲: The environment items which may give a significant impact depending on the scale of project and site conditions.
 No mark: The environmental items which require no important assessment since the anticipated assessment since the anticipated impacts are not significant in general.

Name of Project:	Road improvement of the section of Tulum-Coba-Autopista No.180
Project code:	CTR CTC-4
Location:	Solidaridad and Lazaro Cardenas municipalities, Quintana Roo
Objectives:	- To improve the mobility for one-day trip to Coba archeological ruins from Cancun and other supporting towns, such as Tulum, Playa del Carmen, and Puerto Morelos.
Rationale and scope:	<p>In order to encourage further development, Cancun needs to diversify tourism products targetting at more diversified markets. In this sense, Cancun's beach resorts need to be well integrated with surrounding Mayan ruins and natural attractions. For this purpose, the accessibility to the tourism attractions should be improved, especially within one-day trip area of Cancun.</p> <p>There are some Mayan ruins in the northern area of the state; El Rey, Xelha, Tulum, Muyil and Coba, which are designated in the Mundo Maya program as Route-D. The state roads connecting the ruins require improvement to promote the touring routes because some of them are in very poor conditions.</p> <p>On the other hand, the Federal highway No. 180 (toll road) does not have any entry/exit between Cancun and Valladolid for 150 km. Therefore, it is required to construct a junction at Nuevo X-Can for connecting the toll road and the state road.</p> <ul style="list-style-type: none"> - Re-pavement of 87km existing state road: Tulum-Coba-Nuevo X-Can - Construction of a new junction at Nuevo X-Can to Federal highway No.180
Executing body:	State government, Secretary of Communications and Transport (SCT)
Private sector participation:	
Schedule:	To be implemented by 2002
Related projects:	CTR CTC-3 (AP CTR-2)
Project cost:	\$ 86,300,000, (US\$ 11,507,000)
Financial sources:	State government
Implementation arrangements:	SECTUR and the tourism department of the state government should facilitate coordination between SCT and the state government.
Environmental consideration:	See IEE form

No CTR CTC-4 Road improvement of the section of Tulum-Coba Autopista No.180

Scoping	Site Description											
	Before operation					After operation					Social Environment	
	Reclamation and Spatial Occupancy	Operation of Construction Equipment	Spatial Occupancy	Operation of Vehicles	Operation of Trains/Airplanes/Ships	Operation of Facilities	Accumulation of People and Goods	Inhabitants	Land Use	Economy/Transport	Low population density	
1 Resettlement												
2 Economic activity												
3 Traffic and public facilities	▲											
4 Split of communities												
5 Cultural property												
6 Water rights/Rights of common												
7 Public health condition												
8 Waste												
9 Hazards(Risk)												
10 Topography and geology												
11 Soil erosion	▲											
12 Ground water												
13 Hydrological situation	▲											
14 Coastal zone												
15 Fauna and flora	▲											
16 Meteorology												
17 Landscape												
18 Air pollution		▲										
19 Water pollution	▲											
20 Soil contamination												
21 Noise and Vibration												
22 Land subsidence												
23 Offensive odor												

Note: ●: The environmental items to which special attention has to be paid. They might cause serious impacts that may affect the project formulation depending on the magnitude of the impacts and the possibility of the measure. ▲: The environment items which may give a significant impact depending on the scale of project and site conditions.
 No mark: The environmental items which require no important assessment since the anticipated impacts are not significant in general.

Name of Project:	Nature conservation and tourism amenity improvement of Yum Balam Biosphere Reserve
Project code:	CTR CUN-8 (AP CTR-4)
Location:	Yum Balam biosphere reserve, Razaro Cardenas municipality, Quintana Roo
Objectives:	<ul style="list-style-type: none"> - To activate conservation activities of Yum Balam biosphere reserve - To allow ecotourism use of the biosphere and to diversify nature-oriented tourism products - To encourage local people's participation in ecotourism activities in the biosphere
Rationale and scope:	<p>In order to sustain the growth of international tourist arrivals, it is necessary to diversify tourism products to satisfy tourists of various preferences. Fortunately, in the surrounding areas of Cancun, there are a variety of natural reserves which have not yet well utilized for ecotourism activities.</p> <p>Among them, it is recommende to give the high priority to the Yum Balam biosphere reserve because of its richness of nature and proximity to Cancun. The Yum Balam biosphere reserve is composed of Holbox island and Laguna Conil.</p> <p>There are two access routes from Cancun to the Yum Balam biosphere reserve. One is a direct sea access, and the other is a land access using a road of Cancun-Zaragoza-Chiquila and from Chiquila to the island crossing Laguna Conil by boat. Since the land access is more popular and convenient, while it takes more time through the sea access route, the pier for boats should be improved. In addition, it is recommended to develop an information center, shops , toilets and parking lots at Chiquila, but not in the island.</p> <p>The following components are to be included by the project:</p> <ul style="list-style-type: none"> - Information office for eco-tour orientation and toilet facilities, restaurants - Improvement of the existing pier at Chiquila to the size 10m x 30m - Planning of conservation activities - Training local people as eco-tour guides
Executing body:	State government, Lazaro Cardena municipality
Private sector participation:	The jobs for tour guides and boat operators should be given to local people of Holbox island.
Schedule:	To be implemented by 2002
Related projects:	CTR CTC-4
Project cost:	\$ 4,000,000, (US\$ 533,000)
Financial sources:	State government, Lazaro Cardena municipality
Implementation arrangements:	Measures for controlling tourists' inflow should be formulated. A training system of training local people for eco-tour guides should be established in the project.
Environmental consideration:	See IEE form

No CTR Cun-8 Nature conservation and tourism amenity improvement of Yum Balam Biosphere Reserve

Scoping	Site Description										
	Before operation					After operation					Social Environment
	Reclamation and Spatial Occupancy	Operation of Construction Equipment	Spatial Occupancy	Operation of Vehicles	Operation of Trains/Airplanes/Ships	Operation of Facilities	Accumulation of People and Goods	inhabitants	Land Use	Low population density	
1 Resettlement								Economy/Transport	Agriculture, cattle raising and fishery/road and ferry boats		
2 Economic activity								Natural Environment	Agricultural land, pasture and village settlements		
3 Traffic and public facilities							Topography/Geography				Low wet land
4 Split of communities								Coast and Marine Zone	Mangrove and lagoons		
5 Cultural property							Flora & Fauna				Mangrove, tropical moist forests/small mammals, birds and aquatic
6 Water rights/Rights of common								Pollution	None		
7 Public health condition				▲			Complaints				Measures taken
8 Waste					▲						
9 Hazards(Risk)											
10 Topography and geology											
11 Soil erosion											
12 Ground water											
13 Hydrological situation											
14 Coastal zone	▲										
15 Fauna and flora	▲										
16 Meteorology											
17 Landscape											
18 Air pollution											
19 Water pollution	▲										
20 Soil contamination											
21 Noise and Vibration	▲										
22 Land subsidence											
23 Offensive odor											

Note: ●: The environmental items to which special attention has to be paid. They might cause serious impacts that may affect the project formulation depending on the magnitude of the impacts and the possibility of the measure. ▲: The environmental items which may give a significant impact depending on the scale of project and site conditions.
 No mark: The environmental items which require no important assessment since the anticipated impacts are not significant in general.

Name of Project:	Nature conservation and tourism amenity improvement of Banco Chinchorro
Project code:	CTR CSM-1 (AP CTR-5)
Location:	Othon Pompeyo Blanco municipality, Quintana
Objectives:	<ul style="list-style-type: none"> - To activate nature conservation activities for Banco Chinchorro - To allow wise use of Banco Chinchorro for ecotourism
Rationale and scope:	<p>The main point of the tourism development and promotion strategy for the Cancun tourism region is to integrate beach resorts and Mayan archeological sites to diversify tourism products and markets. For this purpose, a variety of precious natural worlds could be utilized for ecotourism purposes, if conservation activities are intensified and only low impact uses are allowed.</p> <p>One of the rich natural worlds is Banco Chinchorro, which is located about 30 km off the prospective beach resort of Costa Maya. Banco Chinchorro is rich in marine wildlife, covering an area of 46.4 km long and 14.4 km wide. It consists of three main islands: Cayo Centro, Cayo Norte and Cayo Lobos.</p> <p>Still not many visitors enjoy the rich nature of Banco Chinchorro. The area has not yet been commercialized. It is under review to be a national park or a natural reserve area by the federal government.</p> <p>The area is not open to the tourism yet. Only fishermen from Xcalak visit the atoll in search of lobster, snapper, shark etc. To conserve the atoll a type of ecotourism should be introduced for up-market clientele. The project include the following components:</p> <ol style="list-style-type: none"> 1) Study of marine ecology, including flora and fauna of islands 2) Construction and operation of marine patrol center at Majahual and branch at Cayo; patrol boats 3) Construction and operation of marine science center and maintenance at the coast, not on the atoll 4) Information center at Majahual with an orientation room for the eco-tour, exhibition hall of marine science 5) Development of sea excursion tours and tourist piers at islands 6) Service and management development: qualified personnel should be assigned to maintain the area as well as guide for marine ecotourism.
Executing body:	State government
Private sector participation:	The guides and boat operators should be villagers of Costa Maya and no others.
Schedule:	To be implemented by 2002
Related projects:	CTR CSM-2 and 3
Project cost:	\$ 32,500,000, (US\$ 4,333,000)
Financial sources:	INE, State government
Projects evaluation:	
Implementation arrangements:	<ul style="list-style-type: none"> - Training system of the villagers should be established as the guides - Control measures for limiting number the visitors a day should be established
Environmental consideration:	See IEE form

No CTR CSM-1 Nature conservation and tourism amenity improvement of Banco Chinchorro

Scoping	Site Description														
	Before operation					After operation					Social Environment				
	Reclamation and Spatial Occupancy	Operation of Equipment	Spatial Occupancy	Operation of Vehicles	Operation of Trains/Airplanes/Ships	Operation of Facilities	Accumulation of People and Goods	Inhabitants	Land Use	None					
1 Resettlement									Dry and wet forests	None					
2 Economic activity											Economy/Transport				
3 Traffic and public facilities											None/boatsfrom				
4 Spill of communities															
5 Cultural property											Natural Environment				
6 Water rights/Rights of common											Topography/Geography				
7 Public health condition											Coral reef atoll				
8 Waste		▲													
9 Hazards(Risk)											Coast and Marine Zone				
10 Topography and geology											Coral reef and mangrove				
11 Soil erosion		●													
12 Ground water			●								Flora & Fauna				
13 Hydrological situation			●								Tropical mois forest, wet land forest/small mammals and birds				
14 Coastal zone			●												
15 Fauna and flora			●								Pollution				
16 Meteorology											Complaints				
17 Landscape			●								None				
18 Air pollution															
19 Water pollution			●								Measures taken				
20 Soil contamination											None				
21 Noise and Vibration															
22 Land subsidence															
23 Offensive odor															

Note: ●: The environmental items to which special attention has to be paid. They might cause serious impacts that may affect the project formulation depending on the magnitude of the impacts and the possibility of the measure. ▲: The environment items which may give a significant impact depending on the scale of project and site conditions.

No mark: The environmental items which require no important assessment since the anticipated impacts are not significant in general.

Name of Project:	Ecotourism development in Kohunlich archeological sites
Project code:	CTR CCQ-1 (1) (AP CTR-6)
Location:	Othon Pompeyo Blanco municipality, Quintana Roo
Objectives:	<ul style="list-style-type: none"> - To encourage the local community to participate in ecotourism activities - To increase the diversity of tourism products based on the Mundo Maya program
Rationale and scope:	<p>Cancun and its surrounding states (Yucatan and Campeche) have a strategy to develop tourism products based on Mayan ruins. This strategy contributes to diversify tourism products to exploit long-haul tourism markets and other segments of Northern American markets. However, to pursue the tourism development strategy, it is inevitable to increase tourism attractions throughout the region.</p> <p>Many Mayan ruins are scattered throughout the Yucatan peninsular. However, only those in the northern part of the peninsular, such as Chichen Itza, Uxmal and Tulum, have been opened to the public. Most of precious Mayan ruins in Campeche and the southern part of Quintana Roo have not well prepared for tourism use. Kohunlich archeological site, which is located 64 km to the west of Chetumal, is one of the few ruins that are ready to be open to the public.</p> <p>Kohunlich near Chetumal and Xpjil in Campeche are the most important archeological sites as tourism attractions for regional touring in the northern Mundo Maya.</p> <p>As for Kohunlich, rainforests surrounding Kohunlich archeological site could be potential tourism resources together with its ruins. Ecological tours for rainforests and archeological sites should be designed into attractive tourism products for nature and culture lovers.</p> <p>In Kohunlich there are several ball courts in its archeological zone and vestiges of ancient irrigation.</p> <p>The project includes the following components:</p> <ol style="list-style-type: none"> 1) Road development between Francisco Village and Kohunlich and provision of information boards and road signs 2) Construction of an information center with an orientation room and a guide center at Francisco Village 3) Tourism accommodation development <ul style="list-style-type: none"> - A luxurious small-scale hotel with 20 rooms - Ecolodges
Executing body:	State government
Private sector participation:	There is a development proposal of a small-scale hotel near the archeological site by a private company. This type of tourism development should be well coordinated with INAH.
Schedule:	To be implemented by 2002
Related projects:	CTR CCQ-1 (2), (3), (4) and (5)
Project cost:	\$ 66,950,000, (US\$ 8,927,000)
Financial sources:	State government and SECTUR
Implementation arrangements:	The local people, especially those from surrounding villages, should be trained to be tour guides, and small-scale ecolodges should be run by villagers. In these aspects, the state government should support the local people in respect of technical and financial assistances.
Environmental consideration:	See IEE form

No CTR CCQ-1 (1) Ecotourism development in Kohnulich archeological site																				
Scoping																				
	Before operation					After operation					Site Description									
	Reclamation and Spatial Occupancy	Operation of Construction Equipment	Spatial Occupancy	Operation of Vehicles	Operation of Trains/Airplanes/Ships	Operation of Facilities	Accumulation of People and Goods	Social Environment	Inhabitants	Low population density area										
1 Resettlement																				
2 Economic activity						▲														
3 Traffic and public facilities						▲														
4 Split of communities						●														
5 Cultural property																				
6 Water rights/Rights of common																				
7 Public health condition																				
8 Waste																				
9 Hazards(Risk)																				
10 Topography and geology																				
11 Soil erosion																				
12 Ground water																				
13 Hydrological situation																				
14 Coastal zone																				
15 Fauna and flora																				
16 Meteorology																				
17 Landscape																				
18 Air pollution																				
19 Water pollution																				
20 Soil contamination																				
21 Noise and Vibration																				
22 Land subsidence																				
23 Offensive odor																				

Note: ● The environmental items to which special attention has to be paid. They might cause serious impacts that may affect the project formulation depending on the magnitude of the impacts and the possibility of the measure. ▲: The environment items which may give a significant impact depending on the scale of project and site conditions.
 No mark: The environmental items which require no important assessment since the anticipated impacts are not significant in general.

Name of Project:	Community-based ecotourism development in Xpjil archeological sites
Project code:	CTR CCC-1
Location:	Campeche
Objectives:	<ul style="list-style-type: none"> - To increase the diversity of tourism products based on the Mundo Maya program - To encourage the local community to participate in ecotourism activities
Rationale and scope:	<p>Cancun and its surrounding states (Merida and Campeche) has a strategy to develop tourism products based on Mayan ruins, called "Mundo Maya". This strategy is very good to diversify tourism products to exploit long-haul tourism markets and other segments of Northern American markets. However, in order to pursue the tourism development strategy, it is inevitable to increase tourism attractions throughout the region.</p> <p>Many Mayan ruins are scattered throughout the Yucatan peninsular. However, only those in the northern part of the peninsular, such as Chichen Itza, Uxmal and Tulum, have been opened to the public. Most of precious Mayan ruins in Campeche and the southern part of Quintana Roo have not well prepared for tourism use.</p> <p>Xpjil in Campeche and Kohunlich near Chetumal are the most important archeological sites as tourism attractions for regional touring in the northern Mundo Maya.</p> <p>The state government has started to organize local communities for community-based tourism development based on archeological sites of Xpjil. The following directions are emphasized in this effort.</p> <ul style="list-style-type: none"> - Ecotourism development and operation by local people - Ecotourism guide training <p>This type of efforts should be continued to enable the local communities to enjoy benefits from tourism use of Xpjil archeological sites.</p> <p>Furthermore, the state government and FONDOMIXTO should enhance tourism promotion activities for Xpjil archeological sites.</p>
Executing body:	State Government
Private sector participation:	Although the development of community-based ecolodges is encouraged, it is necessary to attract private investments in tourism accommodation development in Xpjil. However, private developers should be strongly encouraged to coordinate with INAH and the state government.
Schedule:	To be implemented by 2002
Related projects:	CTR CCC-1(2)
Project cost:	\$ 80,594,000 (US\$10,746,000)
Financial sources:	State government and SECTUR
Implementation arrangements:	The local people, especially those from surrounding villages, should be trained to be tour guides, and small-scale ecolodges should be run by villagers. In these aspects, the state government should support the local people in respect of technical and financial assistances. The involvement of NGOs is essential to effectively organize and implement the project.
Environmental consideration:	See IEE form

No CTR CCC-1 Community based ecotourism development in Xpilj archeological site

Site Description	Site Description											
	Before operation					After operation				Social Environment		Low population density area
	Reclamation and Spatial Occupancy	Operation of Construction Equipment	Spatial Occupancy	Operation of Vehicles	Operation of Trains/Airplanes/Ships	Operation of Facilities	Accumulation of People and Goods	Inhabitants	Land Use	Economy/Transport	Forest	
1 Resettlement										Tourism and agriculture		
2 Economic activity	▲		▲			▲						
3 Traffic and public facilities			●	▲								
4 Spill of communities												
5 Cultural property												
6 Water rights/Rights of common												
7 Public health condition												
8 Waste												
9 Hazards(Risk)												
10 Topography and geology												
11 Soil erosion												
12 Ground water												
13 Hydrological situation												
14 Coastal zone												
15 Fauna and flora	●		▲								Tropical moist forest/small mammals and birds	
16 Meteorology												
17 Landscape	▲	▲	●									
18 Air pollution												
19 Water pollution	▲											
20 Soil contamination												
21 Noise and Vibration												
22 Land subsidence		▲										
23 Offensive odor												
											Complaints	None
											Measures taken	None

Note: ●: The environmental items to which special attention has to be paid. They might cause serious impacts that may affect the project formulation depending on the magnitude of the impacts and the possibility of the measure. ▲: The environmental items which may give a significant impact depending on the scale of project and site conditions.
 No mark: The environmental items which require no important assessment since the anticipated impacts are not significant in general.

Name of Project:	Infrastructure development for Costa Maya resort
Project code:	CTR CSM-3 (2) (AP CTR-8)
Location:	Othon Pompeyo Blanco municipality, Quintana Roo
Objectives:	<ul style="list-style-type: none"> - To develop infrastructure to guide the development of the Costa Maya resort - To encourage the private sector to invest in tourism accommodations and tourism facilities in the Costa Maya area
Rationale and scope:	<p>The Costa Maya (120 km long), located in the southern Quintana Roo, is remarkably free of development. There are scattered ranches and a few fishing villages, but most of the coast is a continuous deserted line all the way up to Santa Scesilia. The interim communities of Majahual and Xcalak feature pleasant beaches and rustic, camp like accommodations for divers, to dive at Banco Chinchorro located just offshore. A mangrove swamp and jungle featuring series of small lagoons makes excursions very exciting.</p> <p>The utility services such as water supply and electrical supply are not developed for the area and the existing road conditions are extremely poor. The project includes:</p> <ol style="list-style-type: none"> 1) Improvement of the existing road <ul style="list-style-type: none"> - Majahual - Xcalak - Santa Cesilia (62 km) 2) Water supply <ul style="list-style-type: none"> - Water resource (Laguna Huache) and supply system development; water distribution pipes and elevated tank and in-line Booster Pump 3) Electrical supply <ul style="list-style-type: none"> - available from Cafetal to Costa Maya through Majahual
Executing body:	State Government
Private sector participation:	
Implementation:	To be implemented by 2002 but continue to further stage
Related projects:	CTR CSM-1 and 2
Project cost:	\$ 170,800,000, (US\$ 22,773,000)
Financial sources:	State government, but for the electrical supply, IDB fund through FONATUR
Projects evaluation:	The project shall improve life style of the villagers along Costa Maya and promote investors for the tourism of the area.
Implementation arrangement:	
Environmental consideration:	See IEE form

No CTR CSM-3 (2) Infrastructure development for Costa Maya development

Scoping	Site Description											
	Before operation					After operation					Social Environment	
	Reclamation and Spatial Occupancy	Operation of Construction Equipment	Spatial Occupancy	Operation of Vehicles	Operation of Trains/Airplanes/Ships	Operation of Facilities	Accumulation of People and Goods	Inhabitants	Land Use	Low population density	Agricultural land and unused land	
1 Resettlement								Economy/Transport	Agriculture and cattle raising			
2 Economic activity												
3 Traffic and public facilities	▲											
4 Split of communities												
5 Cultural property												
6 Water rights/Rights of common								Natural Environment				
7 Public health condition								Topography/Geography	Coastal wet land and lagoons			
8 Waste												
9 Hazards(Risk)								Coast and Marine Zone	Sandy beach and coral reef			
10 Topography and geology												
11 Soil erosion	▲											
12 Ground water								Flora & Fauna	Tropical moist forest and mangrove/small mammals and birds			
13 Hydrological situation	▲											
14 Coastal zone	▲											
15 Fauna and flora	▲							Pollution				
16 Meteorology								Complaints	None			
17 Landscape												
18 Air pollution		▲										
19 Water pollution												
20 Soil contamination	▲							Measures taken	None			
21 Noise and Vibration												
22 Land subsidence												
23 Offensive odor												

Note: ●: The environmental items to which special attention has to be paid. They might cause serious impacts that may affect the project formulation depending on the magnitude of the impacts and the possibility of the measure. ▲: The environment items which may give a significant impact depending on the scale of project and site conditions.
 No mark: The environmental items which require no important assessment since the anticipated impacts are not significant in general.

5.5.2. Tourism projects to be implemented by 2010

(1) Tourism promotion and institutional programs

Table 5. 13 summarizes tourism promotion and institutional programs to be implemented by the target year of 2010 including action projects. Table 5. 14 details the tourism promotion programs.

Table 5. 13 Summary of tourism promotion projects by type

Types of Projects	Units	Short term	Medium term	Long term	Total
		1997-2000	2001-2005	2006-2010	1997-2010
Publicity (preparation of materials)	Peso	5,499	16,197	10,924	32,620
	US\$	733	2,160	1,457	4,349
Advertisement	Peso	125,737	209,562	209,562	544,861
	US\$	16,765	27,941	27,941	72,648
PR activities	Peso	20,077	33,461	33,461	86,999
	US\$	2,677	4,461	4,461	11,600
Approach to trade sector	Peso	29,844	51,148	51,148	132,140
	US\$	3,979	6,820	6,820	17,619
Approach to consumers	Peso	5,495	13,602	13,602	32,699
	US\$	733	1,814	1,814	4,360
Campaign and events	Peso	4,325	4,813	4,813	13,951
	US\$	577	642	642	1,860
Institutional and organizational programs	Peso	2,908	4,846	4,846	12,600
	US\$	388	646	646	1,680
Total	Peso	193,885	333,629	328,356	855,870
	US\$	25,851	44,484	43,781	114,115

Note: Upper line is in 1,000 Pesos, Lower line is 1,000 US\$

Source: JICA study team

Table 5.14 List of sales promotion projects

Project Name	Implementation bodies	Cost				
		(US\$1,000)	(1,000 Pesos)			
		US\$=7.5 Pesos				
Production of promotional tool						
Image-oriented brochure	Fondo Mixto	560	4,200	700	2,100	1,400
Information-oriented brochure	(ditto)	560	4,200	700	2,100	1,400
Poster	(ditto)	336	2,520	420	1,260	840
Map	(ditto)	1,120	8,400	1,400	4,200	2,800
Manual for travel trade	(ditto)	1,400	10,500	1,750	5,250	3,500
Graphic Media (1)	(ditto)	243	1,820	303	910	607
Graphic Media (2)	(ditto)	131	990	226	377	377
Advertisement						
TV	Fondo Mixto & SECTUR	30,400	228,000	52,615	87,692	87,692
Radio	(ditto)	19,880	149,100	34,408	57,346	57,346
Newspaper (1)	Fondo Mixto	1,573	11,800	2,723	4,538	4,538
Newspaper (2)	(ditto)	7,573	56,800	13,108	21,846	21,846
Magazines (1)	(ditto)	1,568	11,760	2,714	4,523	4,523
Magazines (2)	(ditto)	11,653	87,400	20,169	33,615	33,615
PR activity						
Cooperation to Journalist	State, Fondo Mixto, Hotel, etc.	173	1,300	300	500	500
Familiarization trip	State, Fondo Mixto, Airline, Hotel	10,080	75,600	17,446	29,077	29,077
Press Release	Fondo Mixto	267	2,000	452	769	769
Cooperation to Shooting Crews	State, Fondo Mixto, Hotel, etc.	1,080	8,100	1,869	3,115	3,115
Approach to trade sector						
Seminar/Presentation	Fondo Mixto	5,733	43,000	9,923	16,538	16,538
Familiarization trip for trade sector	State, Fondo Mixto, Airline, Hotel	9,360	70,200	16,200	27,000	27,000
Travel trade show	Fondo Mixto	1,173	8,800	2,031	3,385	3,385
Joint Campaign	(ditto)	867	6,500	1,083	2,708	2,708
Travel Trade Mart (organizing)	(ditto)	485	3,640	607	1,517	1,517
Approach to Consumer						
Travel Week	(ditto)	4,267	32,000	5,333	13,333	13,333
Approach to special interest group	(ditto)	93	700	162	269	269
Campaign and Events						
Visit Year	State & Municipal, etc.	1,600	12,000	4,000	4,000	4,000
Photo contest	(ditto)	260	1,950	325	813	813
Institutional programs						
Visitor arrival survey	Fondo Mixto	1,680	12,600	2,908	4,846	4,846
Total		114,116	855,870	193,885	333,629	328,356

Source: JICA study team

(2) **Tourism development projects**

Proposed projects including action projects at the Level-1 (beach center) and Level-2 (one-day trip area) are summarized by type and category in Table 5. 15. Rest of the projects are listed from Table 5. 16 to Table 5. 21

Table 5. 15 Summary of development projects by type in Level-1 and 2

Types of Projects	Units	Short term	Medium term	Long term	Total
		1997-2000	2001-2005	2006-2010	1997-2010
Category-A					
Tourism attraction	Peso	42,250	83,780	2,400	128,430
	US\$	5,633	11,171	320	17,124
Environmental & Social	Peso	283,000	596,350	0	879,350
	US\$	37,733	79,513	0	117,247
Tourism facilities	Peso	227,050	357,656	223,320	808,026
	US\$	30,273	47,687	29,776	107,737
Hotel accommodation	Peso	3,821,250	5,711,620	8,647,940	18,180,810
	US\$	509,500	761,549	1,153,059	2,424,108
Land development	Peso	203,500	854,500	837,000	1,895,000
	US\$	27,133	113,933	111,600	252,667
Transport (TRP-1)	Peso	169,100	122,050	0	291,150
	US\$	22,547	16,273	0	38,820
Utility services (UTL-1)	Peso	57,500	57,500	0	115,000
	US\$	7,667	7,667	0	15,333
Total of Category-A	Peso	4,803,650	7,783,456	9,710,660	22,297,766
	US\$	640,487	1,037,794	1,294,755	2,973,035
Category-B					
Transport (TRP-2)	Peso	2,280,550	514,020	1,999,830	4,794,400
	US\$	304,073	68,536	266,644	639,253
Utility services (UTL-2)	Peso	50,000	102,650	51,600	204,250
	US\$	6,667	13,687	6,880	27,233
Total of Category-B	Peso	2,330,550	616,670	2,051,430	4,998,650
	US\$	310,740	82,223	273,524	666,487
Total of Category-A and B	Peso	7,134,200	8,400,126	11,762,090	27,296,416
	US\$	951,227	1,120,017	1,568,279	3,639,522

Note: Upper line is in 1,000 Pesos, Lower line is 1,000 US\$

Source: JICA study team

Table 5.16 List of tourism development projects for the Cancun tourism region (1/6)

Reg ion	Project Code	Type	Category	Project Name & Components	Dev. Body		Operation body		Development Cost		Action Plan	
					Public	Private	Public	Private	US\$ (1,000)	Mexican Peso (1,000)		
					Total	Total	Total	Total	1996-2000	2001-2005	2006-2010	
Cancun Tourism Region (CTR)												
CTR Cancun tourism center (CUN) including Isla Mujeres												
CTR	CUN - 1	LDV	A	Cancun resort development phase II	FONATUR	m	FONATUR	m	4,667	17,500	17,500	0
CTR	CUN - 2	LDV	A	Tourism facility development in Cancun resort Phase III area	FONATUR	m	FONATUR	m	20,733	155,500	107,000	35,000
CTR	CUN - 2 (1)	TFC	A	1) Wet'n' wild water amenity facility development	m	m	m	m	1,800	13,500	0	0
CTR	CUN - 2 (2)	TFC	A	2) Theme park : Mavan village	m	m	m	m	8,667	65,000	0	0
CTR	CUN - 2 (3)	TFC	A	3) Aquarium	m	m	m	m	9,333	70,000	0	35,000
CTR	CUN - 2 (4)	TFC	A	4) Tropical Botanical Garden.	m	m	m	m	933	7,000	0	0
CTR	CUN - 3	TFC	A	Improvement of Cancun convention center, phase II	m	m	m	m	26,367	212,750	0	0
CTR	CUN - 4	LDV	A	- Observation tower and commercial development.	FONATUR	m	FONATUR	m	40,000	300,000	30,000	135,000
CTR	CUN - 5	LDV	A	- Malecon Cancun site development	FONATUR	m	FONATUR	m	209,000	1,560,000	156,000	702,000
CTR	CUN - 6	ENV	A	- Laguna Nichupte environmental improvement	State	m	Mun.	m	113,747	853,100	278,500	573,600
				- Study of integrated sewage system for Nichupte Lagoon					20,500	1,500	0	0
				- Regulation/ manual production					1,500	1,500	0	0
				- Environmental information system development					11,500	11,500	0	0
				- Environmental conservation and restoration					10,100	3,000	7,100	0
				- Laguna environmental improvement					44,500	13,000	31,500	0
				- Water supply and sewage improvement					662,000	200,000	462,000	0
				- Solid waste disposal system improvement, include existing dumping site					103,000	30,000	73,000	0
CTR	CUN - 7	TFC	A	Cancun downtown improvement	Mun.	m	Mun.	m	49,867	374,000	129,750	50,000
CTR	CUN - 7 (1)	TRP	B	1) Beautification of shopping area of Cancun downtown	SCT	m	Mun.	m	467	3,500	0	3,500
CTR	CUN - 7 (2)	TRP	B	2) A new bus terminal construction in Cancun central area	Mun.	m	Mun.	m	1,000	7,500	0	7,500
CTR	CUN - 7 (3)	TRP	B	3) Parking meter system improvement in Cancun downtown	Mun.	m	Mun.	m	467	3,500	0	3,500
CTR	CUN - 7 (4)	HTL	A	4) Urban hotel development additional 300 rooms in Cancun downtown	Mun.	m	Mun.	m	21,267	159,500	79,750	79,750
CTR	CUN - 7 (5)	UTL	B	5) Expansion and improvement of urban infrastructure of Cancun downtown	Mun.	m	Mun.	m	26,667	200,000	50,000	100,000
CTR	CUN - 8	ATR	A	Nature conservation and tourism amenity improvement for Yum Balam biosphere reserve	State	m	State	m	533	4,000	4,000	0
				- Information office for eco-tour orientation, guide center, pav toilet, restaurant								
				- Improvement of existing ferry pier at Chiquila to 10m x 30m								
CTR	CUN - 9	HTL	A	Hotel accommodation development in Cancun tourism center area; additional 5,366 ms.	m	m	m	m	538,948	4,042,110	853,620	1,195,620
CTR	CUN - 10	HTL	A	Tourism improvement in Isla Mujeres	State	m	State	m	34,996	262,470	81,430	148,400
CTR	CUN - 10 (1)	TRP	A	1) Hotel accommodation development in Isla Mujeres; additional 355 ms.	State	m	State	m	31,756	238,170	81,430	124,100
CTR	CUN - 10 (2)	TRP	A	2) Asphalt concrete pavement of the existing state road (gravel) between El Mecco and Boca Idesia (27km)	ASA	m	ASA	m	3,240	24,300	0	24,300
CTR	CUN - 11	TRP	B	Cancun airport improvement	ASA	m	ASA	m	295,547	2,216,600	302,250	454,520
				- Increase of parallel runway (3,500 x 46m)								
				- New terminal building construction, 49,000 sq.m								
				- New satellite terminal construction, 159,000 sq.m								
				- Cargo terminal construction								
				- Others								
				Sub-total of Category-A					1,011,724	7,587,930	1,728,050	2,897,510
				Sub-total of Category-B					446,049	3,345,370	2,427,600	565,520
				Total of Cancun tourism center					1,457,773	10,933,300	4,155,650	3,463,030

Table 5. 17 List of tourism development projects for the Cancun tourism region (2/6)

Region	Project Code	Type	Category	Project Name & Components	Dev. Body		Operation body		Development Cost			Action Plan
					Public	Private	Public	Private	US\$ (1,000)	Mexican Peso (1,000)		
					Total		Total		1996-2000	2001-2005	2006-2010	
CTR Cozumel Island (CZM)												
CTR	CZM - 1	HTL	A	Hotel accommodation development in Cozumel (Exist. 3,400 + additional 2,574 rms)	State	m	State	m	1,899,590	405,740	596,460	895,390
CTR	CZM - 2	TRP	A	Access road to San Gervasio archeological site from State link road					11,200	11,200	0	0
CTR	CZM - 3	TRP	A	with 8km pavement of gravel road					74,200	37,100	37,100	0
				Cruiser piers construction at Punta Langosta in Cozumel according to the Action Plan of API	API	API	API	API	74,200	37,100	37,100	0
Sub-total of Category-A									253,275	1,899,590	405,740	596,460
Total of Cozumel Island									1,493	11,200	11,200	0
CTR Cancun-Tulum corridor (CTC)												
CTR	CTC - 1	HTL	A	Hotel development in Cancun-Tulum corridor (exist. 1,500 + additional 12,363 rms.)	Mun.	m			1,050	0	1,050	0
CTR	CTC - 2	UTL	B	Tourism supporting town improvement in Cancun-Tulum corridor					350	0	350	0
CTR	CTC - 2 (1)	UTL	B	1) Puerto Morelos					47	0	47	0
CTR	CTC - 2 (2)	UTL	B	2) Playa del Carmen					47	0	47	0
CTR	CTC - 2 (3)	UTL	B	3) Tulum					47	0	47	0
CTR	CTC - 3	TRP	B	Study and design of tourism supporting town. Development urban infrastructure, Public park, educational facilities, residential and commercial	SCT	SCT	SCT	SCT	253,333	1,900,000	1,900,000	0
CTR	CTC - 4	TRP	B	Study and design of tourism supporting town. Development urban infrastructure, Public park, educational facilities, residential and commercial	State	State	State	State	11,507	86,300	78,300	8,000
CTR	CTC - 5	TRP	A	Re-pavement of 87km existing state road					8,000	8,000	8,000	0
CTR	CTC - 5 (1)	TRP	A	1) Coba-Ixil-X-Ujuba; pavement of gravel road (40km)					480	3,600	3,600	0
CTR	CTC - 5 (2)	TRP	A	2) Coba-Chemex including pavement and widening to 7m wide (91km)					5,737	43,400	43,400	0
				Sub-total of Category-A					1,207,523	9,056,420	1,913,260	2,631,160
				Sub-total of Category-B					264,980	1,987,350	1,978,300	9,050
				Total of Cancun-Tulum corridor					1,472,503	11,043,770	3,896,560	2,840,210
CTR Sian Ka'an Biosphere Reserve (SAK)												
CTR	SAK - 1	TFC	A	Tourism facilities development in Sian Ka'an biosphere reserve	Mun.	m	Mun.	Mun.	17,740	133,050	0	66,350
CTR	SAK - 1 (1)	TFC	A	1) Information center at Tulum, Yaja Chico and Mahahar					140	1,050	0	350
CTR	SAK - 1 (2)	HTL	A	Ecological hotel (Eco-hotel) development, total of 200 rms					17,600	132,000	0	66,000
CTR	SAK - 2	ATR	A	1) Tourist facilities development in Felipe Carrillo Puerto					2,007	15,050	0	15,050
CTR	SAK - 2 (1)	ATR	A	1) Tourist facilities development in Felipe Carrillo Puerto					1,960	14,700	0	14,700
CTR	SAK - 2 (2)	TRP	A	2) Parking area development in Felipe Carrillo Puerto					47	700	0	350

Table 5.18 List of tourism development projects for the Cancun tourism region (3/6)

Reg ion	Project Code	Type	Category	Project Name & Components	Dev. Body		Operation body		Development Cost Mexican Peso (1,000)				Action Plan		
					Public	Private	Public	Private	US\$ (1,000) Total	1995-2000	2001-2005	2006-2010			
CTR	SAK - 3	TRP	B	Improvement of Federal road from Felipe Carrillo Puerto to Uman /Menda	SC1			SC1	71,467	536,000	0	0	536,000		
				Improvement from road C type (2lanes W=7m) to type A2 (2lanes W=12m); Mex-184, 261, from Felipe Carrillo Puerto - Uman (268 km).					19,747	148,100	0	0	66,700		
				Sub-total of Category-A					71,467	536,000	0	0	536,000		
				Sub-total of Category-B					81,400	0	0	0	81,400		
				Total of Sian Ka'an Biosphere Reserve					152,867	536,000	0	0	617,867		
CTR	Costa Maya (CSM)														
CTR	CSM - 1			Nature conservation and tourism amenity improvement of Banco Chinchorro					4,333	32,500	1,500	31,000	0	APCTRS	
CTR	CSM - 1 (1)	TFC	A	1) Development of tourist piers at islands	State		State		933	7,000	0	7,000	0		
CTR	CSM - 1 (2)	TFC	A	2) Information center at Mahahual	State		State		400	3,000	0	3,000	0		
CTR	CSM - 1 (3)	ENV	A	3) Study of marine ecology and flora and fauna of islands	INE		INE		200	1,500	1,500	0	0		
CTR	CSM - 1 (4)	ENV	A	4) Marine patrol center at Mahahual and branch at Cayo	INE		INE		133	1,000	0	1,000	0		
CTR	CSM - 1 (5)	ENV	A	5) Marine science center and maintenance at Mahahual	INE		INE		2,667	20,000	0	20,000	0		
CTR	CSM - 2			Hotel accommodation development in Costa Maya					155,827	1,168,700	342,810	254,790	571,100		
CTR	CSM - 2 (1)	HTL	A	1) Small scale accommodation development: 20 rms.in each Xcalak and Tampalan for initial stage	m		m		264	1,960	1,960	0	0		
CTR	CSM - 2 (2)	HTL	A	2) Hotel accommodation development at Costa Maya, 1,734 rooms	m		m		155,563	1,166,720	340,850	254,790	571,100		
CTR	CSM - 3			Development of Costa Maya					37,000	277,500	114,100	159,400	4,000		
CTR	CSM - 3 (1)	TFC	A	1) Development of tourist piers in Costa Maya (3 Piers) - at Punta Herrero, - at Punta Xocoxh - at Xcalak	State		State		320	2,400	800	1,600	0		
CTR	CSM - 3 (2)	TRP	A	2) Infrastructure development for Costa Maya resort - Improvement of coastal road for Costa Maya development - Mahahual - Xcalak - Santa Cecilia (62 km) - La Aguada - Xcalak (12 km) - Mahahual - Punta Putucub - Tampalam (55 km) - La Aguada - Xcalak (12 km)	State		State		30,813	231,100	113,300	117,800	117,800	0	APCTR-8
				- Water supply development between Xcalak - Punta Herrero				15,490	116,100	55,800	60,300	60,300	0		
				- Water resource (Laguna Huach, etc.) and supply system development					55,800	55,800	55,800	0	0		
				- Electric supply development from Cafetal to Costa Maya through Mahahual					10,800	10,800	10,800	0	0		
CTR	CSM - 3 (3)	TRP	B	3) Development of air strip 1,200m long in Mahahual	State		Mun.		10,667	80,000	40,000	40,000	0		
CTR	CSM - 4	TRP	B	Aguada ferry port terminal improvement (10 m x 80 m)	State		State		4,667	35,000	17,500	17,500	0		
				Sub-total of Category-A					5,333	40,000	0	40,000	0		
				Sub-total of Category-B					191,293	1,434,700	458,410	405,190	571,100		
				Total of Costa Maya					5,867	44,000	0	40,000	4,000		
				Improvement of Chetumal area					197,160	1,478,700	458,410	445,190	575,100		
CTR	CTM - 1	HTL	A	1) Hotel accommodation development: additional 1,808 rms.	m		m		0	1,188,010	78,140	432,540	677,330		
CTR	CTM - 1 (1)	HTL	A	1) Hotel accommodation development in Chetumal, Bacalar and Caliditas	m		m		158,401	1,188,010	78,140	432,540	677,330		
CTR	CTM - 1 (2)	TFC	A	2) Beautification of Chetumal city - Landscape improvement of Heroes avenue - Rehabilitation of water fountains (5 spots) - Rehabilitation of the existing theater - Improvement of the bus terminal	Mun.		Mun.		7,094	53,206	0	39,206	14,000		

Table 5. 19 List of tourism development projects for the Cancun tourism region (4/6)

Reg ion	Project Code	Ty pe	Cate gory	Project Name & Components	Dev. Body		Operation body		US\$ (1,000) Total	Development Cost			Action Plan	
					Public	Private	Public	Private		Mexican Peso (1,000)	1996-2000	2001-2005		2006-2010
CTR	CTM - 2	TFC	A	Tourism complex in Bacalar - Hotels - Marina - golf course		m		m	37,749	283,120	0	141,000	142,120	
CTR	CTM - 3	TFC	A	Tourism development in Bahía de Chetumal and Caldentías - Improvement of the tourism commercial area of Caldentías - Nature oriented tourism at Punta Laxartos and L. Echeverría - Tourist pier, pedestrian networks, eco-lodge type hotel, and commercial zone at Isla Tamaicab - Hot spring resort development in Caldentías area and Punta Catalán	Mun.	m		m	11,533	86,500	0	55,000	31,500	
CTR	CTM - 4	UTL	B	Infrastructure development in Chetumal, Bacalar, and Caldentías (1) Drainage network rehabilitation, urban road improvement, lighting system development along the coastal area in Chetumal (2) Improvement of main street and park in Subteniente Lopez (3) Electric supply and improvement of street and lighting system in Bacalar (4) Water supply and beautification of coastal area in Caldentías	Mun.		Mun.		45,827	343,700	0	206,100	137,600	
CTR	CTM - 4	TRP	B		Mun.		Mun.		67	500	0	500	1,000	
CTR	CTM - 4	UTL	B		Mun.		Mun.		267	2,000	0	1,000	1,000	
CTR	CTM - 4	UTL	B		Mun.		Mun.		160	1,200	0	600	600	
Sub-total of Category-A									214,778	1,610,836	78,140	667,746	864,950	
Sub-total of Category-B									45,827	343,700	0	206,100	137,600	
Total of Costa Maya									260,605	1,954,536	78,140	873,846	1,002,550	
CTR	CCQ - 1	ATR	A	Mayan culture eco-tour development; Mayan ruins, villages, rain forests	State		Villages		14,631	109,730	38,250	69,080	2,400	
CTR	CCQ - 1	ATR	A	(1) Ecotourism development in Kohunlich archeological site - Francisco villa- Kohunlich road, sign information improvement - Information center with a orientation room and guide center - Hotel accommodation development 20 rooms					8,927	66,950	38,250	28,700	0	APCTR-6
CTR	CCQ - 1	ATR	A	(2) Chichan - Ha ecotourism development - Information center with a orientation room and guide center - Mayan Camp (20 tents) area development, solar energy development					2,400	18,000	0	18,000	0	
CTR	CCQ - 1	ATR	A	(3) Campamento Ecoturístico y Cinegético la Pirámide : ecotourism development in the places of Tres Garantías - Office, water supply development, radio communication, access and sign board, solar energy development, road rehabilitation and vehicles, others					467	12,500	0	5,500	0	
CTR	CCQ - 1	ATR	A	(4) Ya ab Dzoonot : ecotourism development - 6 ecological type accommodation, club house, horse, birds, butterfly cabin, reproduction center, camp site, multi purpose ground, access road improvement					2,000	15,000	0	15,000	0	
CTR	CCQ - 1	ATR	A	(5) Balneario Raudales: ecotourism development along the river Raudales - 6 cottage accommodation, parking, toilets, changing rooms, sports facilities, etc.					517	3,880	0	3,880	0	
CTR	CCQ - 1	ATR	A	(6) El Palmar resort development - Ecological accommodation, pool, walking path and bridge, sports field, etc					320	2,400	0	0	2,400	
CTR	CCQ - 2	ENV	A	Restoration of ruin and development of tourism facilities; information center; signs, etc.					500	3,750	2,000	1,750	0	
CTR	CCQ - 2	ENV	A	(1) Chacchoben, rehabilitation and excavation of 2 turns	INAH		INAH		107	800	800	0	0	
CTR	CCQ - 2	ENV	A	(2) Chactemal, improvement of site	INAH		INAH		160	1,200	1,200	0	0	
CTR	CCQ - 2	ENV	A	(3) Dzibanche, development of tourist service and information	INAH		INAH		127	950	0	950	0	
CTR	CCQ - 2	ENV	A	(4) La Laguna, rehabilitation and excavation of ruin.	INAH		INAH		107	800	0	800	0	

Table 5. 20

List of tourism development projects for the Cancun tourism region (5/6)

Reg ion	Project Code	Type / Category	Project Name & Components	Dev. Body		Operation body		Development Cost		Action Plan	
				Public	Private	Public	Private	US\$ (1,000) Total	Mexican Peso (1,000) 1996-2000 2001-2005 2006-2010		
CTR	CCC - 3	TRP A	Improvement of access roads to Mayan ruins from Federal Highway No.136 - To Pasion de Cristo, Rio Bec, X-pujil, Becan, Chicana; pavement of existing road (15 km)	State		State		2,400	18,000	0	0
Sub-total of Category-A											
Total of Chetumal - Campeche corridor in Quintana Roo State											
CTR	Other areas (OTR)	HTL A	Hotel accommodation development in other areas of the state - additional 540 rooms.		m		m	45,775	343,310	108,500	105,610
Sub-total of Category-A											
Total of Other areas (OTR) in Quintana Roo State											
Quintana Roo State											
Total of Category-A											
Total of Category-B											
Grand total of Jalisco State											
CTR	Chetumal - Campeche corridor in Campeche State (CCC)		Community-based ecotourism development in Xpujil archeological area			State		21,866	163,994	163,750	0
CTR	CCC - 1	(1) TRP A	Improvement of Conhuas-Calakmul road and access road to archeological sites of Hormiguero, Vaacbal, Oxpenut, La Mheca (131 km)	State		State		21,767	163,400	0	0
CTR	CCC - 1	(2) ATR A	El Ramonal, Calakmul, Manuchin Ruin trekking improvement with sign information	State		State		47	350	0	350
CTR	CCC - 1	(3) ATR A	Development of the Mayan culture eco-tour base at the villages of Veinte de Noviembre and Eugenio Echeverria No.2	State		State		33	244	244	0
Sub-total of Category-A											
Total of Chetumal - Campeche corridor in Campeche State											
CTR	Campeche tourism center (CPE)		Beautification of Campeche downtown			Mun.		187	1,400	0	1,400
CTR	CPE - 1	ATR A	Information signboard improvement at each historical building /site			Mun.		59,393	520,450	128,950	155,600
CTR	CPE - 2	HTL A	Hotel accommodation development in Campeche tourism center, additional 812 rms		m	Mun.		69,580	521,850	128,950	157,000
Sub-total of Category-A											
Total of Campeche tourism center											
CTR	Merida-Campeche corridor (CMC)		Campeche archeological circuit development			Mun.		93	700	0	350
CTR	CMC - 1	ATR A	Information sign along the circuit			Mun.		140	1,050	350	700
CTR	CMC - 2	ATR A	Celestun biosphere reserve area tourism improvement		m	Mun.		233	1,750	350	1,050
Sub-total of Category-A											
Total of Merida-Campeche corridor											
CTR	Merida tourism center (MID)		Beautification of Merida downtown			Mun.		187	1,400	0	1,400
CTR	MID - 1	ATR A	Information signboard improvement at each historical building /site			Mun.		76,227	571,700	161,700	180,000
CTR	MID - 2	HTL A	Hotel accommodation development in Merida tourism center, additional 697 rms.		m	Mun.		76,413	573,100	161,700	181,400
Sub-total of Category-A											
Total of Merida tourism center											

Table 5.21 List of tourism development projects for the Cancun tourism region (6/6)

Region	Project Code	Type	Category	Project Name & Components	Dev. Body Public	Operation body Public	Private	US\$ (1,000)		Development Cost Mexican Peso (1,000)			Action Plan
								Total	Private	Total	1996-2000	2001-2005	
CTR Merida - Cancun corridor													
CTR	MCC - 1	ATR	A	Valladolid historical town improvement - Historical building beautification with sign information and landscaping - Rio Lagartos Biosphere reserve area improvement	Mun.	Mun.		187	1,400	0	1,400	0	0
CTR	MCC - 2	ATR	A	1) Tourism facility development - Tourist boats - Tourist pier, observation decks development at Los Lagartos - Pay toilet, refreshment stand	m	m		1,013	7,599	0	7,599	0	0
CTR	MCC - 2 (1)	ATR	A	2) Rio Lagartos village improvement with beautification - Village beautification	Mun.	Mun.		453	3,399	0	3,399	0	0
CTR	MCC - 2 (2)	UTL	B	- Infrastructure improvement with sewage and solid waste collection system	Mun.	Mun.		299	1,400	0	1,400	0	0
								900	900	0	900	0	0
								800	800	0	800	0	0
								560	4,200	0	4,200	0	0
								700	700	0	700	0	0
								640	4,799	0	4,799	0	0
								560	4,200	0	4,200	0	0
								1,200	8,999	0	8,999	0	0
Other states													
								168,732	1,263,493	291,244	507,999	466,250	0
								560	4,200	0	4,200	0	0
								169,292	1,269,693	291,244	512,199	466,250	0
Grand total of Cancun Tourism Region													
								3,141,768	23,563,259	5,094,894	8,291,455	10,176,910	0
								834,749	6,260,620	4,405,900	611,600	1,243,120	0
								3,976,517	29,823,879	9,500,794	8,903,055	11,420,030	0

Notes:

1 Cost=\$1,000 estimated by JICA study team (1996 price)

2 Abbreviations of Project Code:

Project code number: indications:

(1) Tourism region: BCS= Baja California Sur.

(2) Tourism Center/Product:

(3) Type of projects:

ATR= Tourism attraction development/improvement. ENS= Environmental conservation and social development. TFC= Tourism facilities development. HTL= Hotel accommodation development.

LDV= Land Development, TRP= Transport development/improvement, UTL= Utility service system development.

(4) Category of projects:

A= Projects directly related to tourism, B= Projects indirectly related to tourism but developed under the strategies of national and/or state development.

4 APCTR = Project selected as Action Plan for Cancun Tourism Region

5.6. Economic and financial analyses

5.6.1. Analysis of past performance of Cancun

The study team calculated the economic internal rate of return (EIRR) in Cancun to be 4.3% during the 1980-1994 period based primarily on FONATUR data under the assumption that the residual value of past investment was counted to be a benefit in 1995. This shows the past tourism investment was not so effective in Cancun, though EIRR is the highest in the three destinations. The cost side analysis shows infrastructure investment cost, private sector investment, and housing investment, and operation costs constitute approximately 2.6%, 15.2%, 12.9%, and 69.3%, respectively. The benefit side analysis shows the regional economic effects constitute 70.1% of the benefit while that of employment creation constitutes 17.4% and multiplier effect constitute remaining 12.5%.

One of major problems in Cancun is the quality of goods supplied in the region, though the economic viability system has established a little bit. It is necessary to create additional values for the destination using the resources maximally.

5.6.2. General assumptions for the economic and financial analyses

a. Area for the analysis:

The analysis is applied for the priority development area; Level-3 as set in the development scenario for the Cancun tourism region.

b. Target year:

The evaluation covers the years from 1996 to 2010, which are divided into the following 3 phases.

- Short term: 1996-2000
- Medium term: 2001-2005
- Long term: 2006-2010

c. Development costs

The development costs applied for the analysis are summarized in Table 5. 22 by type of project and phase.

Table 5. 22 Development costs by type of project and phase

		Short term	Medium term	Long term	Total
Transportation-A	TRP-A	84,975	46,313	0	131,288
Transportation-B	TRP-B	584,088	143,455	499,958	1,227,500
Urban utilities	UTL-B	26,875	90,755	46,900	164,550
Environmental	ENV	140,500	297,300	0	437,800
Land development	LDV	101,750	424,775	418,500	948,025
Sub total		938,188	1,005,618	965,358	2,909,163
Land acquisition cost		93,819	100,562	96,536	290,916
Hotel	HTL	3,852,475	5,717,026	8,648,200	18,217,701
Tourism attraction	ATR	43,050	87,530	2,400	132,980
Other transportation	TFC	247,416	337,790	223,320	808,526
Sub total		4,142,941	6,142,346	8,873,920	19,159,207
Land acquisition cost		144,353	213,581	302,513	660,448
Total		5,319,300	7,462,107	10,238,327	23,019,734

Note: unit of amount: 1,000 pesos

Source: JICA study team

d. Hotel arrivals

The target of hotel arrivals applied for the analysis are summarized in Table 5. 23 .

Table 5. 23 Hotel arrivals for major tourism centers

Tourism centers	Domestic				International			
	1995	2000	2005	2010	1995	2000	2005	2010
Cancun	489	546	621	734	1,666	1,788	1,929	2,148
Cozmel	67	80	97	123	243	297	370	480
Tulum corridor	7	62	143	263	108	358	719	1,259
Costa Maya		16	25	43		49	80	147
Others		39	93	161		78	163	254
Target	589	744	977	1,324	2,113	2,570	3,262	4,286

Note: unit of arrivals: 1,000 pesos

Source: JICA study team

e. Tourist expenditure

Unit expenditure

Unit expenditures are assumed based on hotel guest expenditure in 1994 and 1995. Unit expenditure of both foreign tourists and domestic tourists will increase due to level up of facilities, though inflation is not considered in this analysis. Unit expenditure in the Quintana Roo state would increase by 20% from 1996 to 2010 in both domestic and foreign tourists.

Table 5. 24 Tourist expenditure of the primary tourism center

	1994		1996-2000		2001-2005		2006-2010	
	Local	Intern'l	Local	Intern'l	Local	Intern'l	Local	Intern'l
Cancun	3,090	4,770	3,000	8,700	3,300	9,570	3,600	10,440
Cozmel	1,610	3,200						

Note: unit of expenditure: pesos

Source: JICA study team

Expenditure ratio by category

Self sufficient rates are estimated by expenditure categories, which are used by Mexico bank and FONATUR as follows.

Table 5. 25 Expenditure ratio by category

	1994								1996-2010			
	Local				international				Total			
	L	F	S	O	L	F	S	O	L	F	S	O
Cancun	35	30	6	29	28	32	6	34	31	31	6	32
Cozmel	37	39	9	15	29	42	9	19				

Note: Unit of ratio: %, L: lodging , F: food and drink, S: shopping, O: others

Source: SECTUR data, compiled by JICA study team

f. Others

The followings are also assumptions taken for the analysis.

- Prices and exchange rates are set and used as of 1996(1 US dollar = 7.5 pesos)
- No inflation is considered to evaluate both economic and financial analysis.

5.6.3. Economic analysis

The objective of the analysis is to evaluate economic viability of the tourism development in the development priority area (Level-3) of the Cancun tourism region.

(1) Methodology of economic analysis

a. Economic benefit

Direct benefit

Direct benefit of tourism development is regional economic effects which is calculated as a certain part of increment in number of tourists with projects proposed. The formula is as follows.

$$(\text{direct benefit}) = (\text{number of tourists with projects} - \text{number of tourists without projects}) \times (\text{unit expenditure}) \times (\text{self sufficient rate})$$

The number of tourists with projects is calculated by linear-adjusting way based on the target hotel arrival in 2000, 2005 and 2010. The number of tourists without projects is assumed to increase until 1999 due to the effects of past investment as follows.

- 1996 = 80% of that with projects
- 1997 = 70% of that with projects
- 1998 = 60% of that with projects
- 1999 = 50% Of that with projects
- After 2000 = same figure of 1999

Self sufficiency rates

Self sufficient rates of each tourist expenditure category are estimated based on interview survey. Although the ratio of food and drink, and shopping are assumed to increase due to promotion of local industries, the increase points are half of other regions because of the difficulty of local industry development caused by location and natural conditions.

Table 5. 26 Self sufficient rate

	1994	1996-2000	2001-2005	2006-2010
Lodging	50.0	50.0	50.0	50.0
Food and drink	20.0	25.0	35.0	55.0
Loreto Shopping	20.0	25.0	35.0	50.0
Lapaz Others	80.0	80.0	80.0	80.0

Note: unit: %

Source: JICA study team

Indirect benefit

Indirect benefit generally consists of employment creation, multiplier effects and other indirect benefits. But it is very difficult to estimate other indirect benefits, therefore the benefits of employment creation and multiplier effects are calculated.

Indirect employment of hotel workers

According to the studies done by SECTUR and the Service Census in 1993, the number of workers in tourism related industries are 2.5 times of hotel workers. The benefit of indirect employment is estimated concerning to the cumulative hotel rooms increased.

- Number of hotel workers per room: 1.3

-
- Average income of related industries: \$ 10,000/year

Increase of employment in the construction industry

Increase of construction workers is assumed in proportion to construction investment.

- Number of construction workers: 9.4 per million \$ of investment
- Average income of construction industry: \$ 14,000/year

Multiplier effects of tourist consumption

Multiplier effects According to the input-output table in 1985, the intermediate input of hotel and restaurant is 14 %. To estimate multiplier effects, it is assumed that 50 % of the intermediate income is circulated locally.

Multiplier effects of construction work

According to the input-output table in 1980, the intermediate input of construction industry is 53 %. To estimate multiplier effects, it is assumed that 30 % of intermediate income is circulated locally.

Other indirect benefits

Increase of foreign currency and government revenue, improvement of economic structure, promotion of business activities and social impacts for regional development. However, these are national-level effects and also difficult to estimate. Therefore, these benefits are excluded in this analysis.

b. Costs

Future costs are composed of those of construction, promotion and operation.

Construction costs and cost sharing

Construction costs are estimated for each project as shown in Table 5. 22. Indirect investment such as planning and studies is counted by 5% of infrastructure investments.

Some investments contribute not only to tourism industry but also to other local industries and social welfare. Therefore, contribution factors of investments to the tourism are assumed by considering the nature of relations of each investment with tourism as follows.

- Tourism facilities: 100%
- Transportation for mainly tourism: 75%
- Transportation for regional development: 25%
- Land development: 75%
- Urban utilities: 25%
- Environmental protection and improvement: 50%

Residual value of past investments is not counted in this analysis, though that of future investment is counted in 2011 because almost all projects will be used after this evaluation period. The residual periods are set as follows.

- Infrastructure 30 years
- Indirect investment 15 years
- Tourism facilities 15 years

No land acquisition cost is considered to evaluate economic analysis.

Promotion costs

Promotion costs are also estimated for each promotion activity.

Operation costs

Operation costs are assumed as 30% of cumulative costs of developing infrastructure, such as road, airport, sewerage, water and electric supply, and 58% of tourists consumption at related facilities, such as hotel, museum, marina and golf course.

Conversion factors to economic prices

The following conversion factors to economic prices are adopted based on the report of "Socio-Economic Evaluation of Ex-post Cancun" by FONATUR.

- Construction of infrastructure: 0.726
- Construction of facility: 0.699
- Operation and maintenance: 0.692

The conversion factor to economic prices of promotion is assumed to be as the same as that of operation and maintenance.

(2) **Economic analysis of Cancun tourism region**

The economic internal rate of return (EIRR) is 24.7 %. Table 5. 27 shows results of the sensitivity analysis based on the EIRR of 24.7%.

Table 5. 27 Economic internal rate of return (EIRR)

Cases of sensitivity analysis	EIRR (%)
Base Case	24.7
Increase of Total Benefit (+20%)	47.2
Decrease of Total Benefit (-20%)	2.5
Increase of Total Cost (+20%)	6.3
Decrease of Total Cost (-20%)	53.3

Source: JICA study team

In case of benefit increase or cost reduction, economic viability is improved significantly. The main cause of benefit increase is increase of tourists inflow and their expenditure. However, there is a certain relationship between tourists increase and cost by item. In general, investment for infrastructure and facilities are required to receive tourists increase, and effective sales promotion attracts more tourists. But there is not any substantial data for quantitative analysis for the effects of the sales promotion.

Therefore, sensitivity analysis by combination of cost increase and benefit increase is conducted to clarify cost capacity for benefit increasing. If 5% increase of cost generate 10% increase of benefit, the future EIRR will be 29.9 % and economic viability will be improved. In order to ensure economic viability with 20% of benefit increase, total cost is allowed 10% increase. As such further efforts to attract more tourists is required for sound growth of the tourism industry

Table 5. 28 Sensitivity analysis of EIRR by cost and benefit increase

Cases	Cost: +5%	Cost: +10%	Cost: +20%
Benefit: +20%	40.5 %	34.6 %	24.7 %
Benefit: +10%	29.9 %	24.7 %	
Benefit: +5%	24.7 %		

Source: JICA study team

(3) Financial analysis

a. Objectives of the analysis

A primary analysis from the financial view points is executed in order to promote private investments for tourist facilities and public investments for construction of infrastructure. The financial analysis is conducted for the following objectives:

Propriety of public investment for infrastructure

The propriety of public investment is to be evaluated by the revenue and expenditure ratio (R/E). The R/E ratio is estimated with the assumption that discount ratio is 8.5%, which is supposed to be an opportunity cost of investment.

Profitability of private investment

For the private sector, the financial rate of return (FIRR) is estimated in a simple model with only two sub-sectors, namely the hotel industry and the other tourism industry.

b. Major assumptions of financial analysis

Major assumptions used for financial analysis are as follows.

Hotel arrivals and unit expenditure of tourists

The number of hotel arrivals and unit expenditure of tourists are assumed as the same as those in economic analysis, though the conversion rate to economic costs and the self sufficient rate are not used.

Infrastructure costs

The cost of the public sector are composed of operation and maintenance, and depreciation costs.

All infrastructure are assumed to be constructed and operated by public sector, though there are many types of management execution.

Tax

The revenue for public sector is taxes. In this analysis, two kinds of taxes, value added tax(IVA) and business income tax(ISR), are taken into account. Concerning hotel tax, it is said that the tax would be used for promotion activities, therefore the tax is not counted as the revenue.

Revenue for private sector

The revenue for private sector is calculated as follows.

Revenue = (increment of number of hotel arrival) x (unit consumption) x (1-consumer tax rate)

Cost of private sector

The costs of private sector are composed of operation and maintenance, depreciation, promotion costs and interest and business income tax.

The operation and maintenance cost is estimated as 58 % of tourists expenditure due to the high level of self sufficiency rate in the Quintana Roo state.

The depreciation cost is assumed to be one fifteen of investment of tourism facilities including hotels, though the depreciation cost of infrastructure is assumed to be one thirtieth of these investments.

Concerning promotion costs one third of promotion cost proposed is counted to be the costs of private sector. But if the hotel tax exceeds the whole promotion cost, the burden by private sector is assumed to be zero.

Business income tax is calculated by multiplied the profit after reducing interest payment. The rate of business income tax is assumed to be 34%. If there is cumulative loss no business income tax is charged.

Land acquisition cost

The land acquisition costs are added to the investment costs proposed in the lists of implementation Land acquisition costs against each investment cost are assumed as follows.

- High rank hotel	4.2 %
- Middle rank hotel	2.9 %
- Low rank hotel	1.1 %
- Other facilities	5.0 %
- Infrastructure	10.0 %

Concerning land acquisition costs the residual value in 2011 is all of the invested amount from 1996 to 2010 because the depreciation cost of land is not considered generally.

Half of investment costs by private sector including land acquisition costs is assumed to be loaned by banks in the first year of each phase. The loan conditions are as follows.

- Repayment year: 10 years with 3 years grace period
- Interest 16 % per year
- Land acquisition is also assumed to be done in the first year of each phase.

In order to calculate financial rate of return (FIRR), the investment costs including land acquisition cost, maintenance and operation cost and promotion costs burdened by private sector are considered for expenditure.

c. Results of financial analysis

Revenue and expenditure ratio (R/E)

The revenue and expenditure ratio (R/E) of public sector for the Los Cabos tourism region is 1.84 in case of discount rate is 8.5%, which is sufficient.

Financial internal rate of return

The financial internal rate of return (FIRR) of private sector is 27.5 %. A sensitivity analysis was made as shown in Table 5. 29 based on the base case of 27.5 %.

Table 5. 29 Financial internal rate of return (FIRR)

Cases of sensitivity analysis	FIRR (%)
Base Case	27.5
Increase of Revenue (+20%)	43.2
Decrease of Revenue (-20%)	7.4
Increase of Expenditure (+20%)	11.2
Decrease of Expenditure (-20%)	46.8

Source: JICA study team

If the business income tax is counted for expenditure, FIRR becomes 23.3%.

In order to check whether the proposed investment plan is optimum or not, the sensitivity analysis of investment for hotels and/or other facilities are done as follows.

Table 5. 30 Sensitivity analysis of FIRR by private investment of hotels or other facilities

Private	-10 %	0 %	+10 %	Hotel
+10 %	30.4 %	28.2 %	26.3%	
0 %	29.6 %	27.5 %	25.6 %	
-10 %	28.8 %	26.7 %	24.9 %	
Other facilities				

Source: JICA study team

In the Cancun tourism region, investment plan with less hotels and more other facilities is more suitable from the financial view point under the assumption that the demand elasticity is 0.5.