



## Coastal Strategy for the Southeastern Coast of Bali



**COASTAL STRATEGY  
FOR THE SOUTHEASTERN COAST OF BALI**

## CONTENTS

List of Figures .....	2
List of Photos .....	3
List of Acronyms and Abbreviations .....	4
Foreword .....	5
Acknowledgments .....	7
The Southeastern Coast of Bali .....	8
Balinese People and Their Culture .....	11
The Value of the Southeastern Coast of Bali .....	16
Threats and Their Impacts .....	26
Response	
Vision and Mission .....	31
Desired Changes and Outcomes .....	34
The Strategies .....	36
Strategy 1: Communicate .....	38
Strategy 2: Develop .....	42
Strategy 3: Protect .....	47
Strategy 4: Preserve .....	52
Roles and Responsibilities .....	57
Policy and Regulations .....	62
Appendices .....	66
References .....	73

## LIST OF FIGURES

- Figure 1. Bali Island as site of national ICM demonstration project in Indonesia.
- Figure 2. Map of rivers in Bali.
- Figure 3. Population density in the southeastern coast of Bali.
- Figure 4. Location of temples in the southeastern coast of Bali.
- Figure 5. Sites for Hindu Melasti (religious) ceremonies.
- Figure 6. Archaeological sites in the southeastern coast of Bali.
- Figure 7. Tourist arrival in Bali during 1968–1999.
- Figure 8. Organizational structure of IIMS.
- Figure 9. A strategic approach to achieving a shared vision for the southeastern coast of Bali.
- Figure 10. The institutional mechanism for coastal strategy implementation.

## LIST OF PHOTOGRAPHS

- Photo 1. Mulang Pekelem (religious ceremony) in Lebih Beach.
- Photo 2. Melasti (religious ceremony) in Padang Galak Beach.
- Photo 3. Coral reef in Nusa Dua Beach.
- Photo 4. Mangrove forest in Lembongan.
- Photo 5. Reef fishery in Nusa Dua.
- Photo 6. Seagrass bed in Nusa Dua.
- Photo 7. Turtle nursery in Lembongan.
- Photo 8. Kuta Beach.
- Photo 9. Nusa Dua.
- Photo 10. Nusa Lembongan.
- Photo 11. Sanur Beach.
- Photo 12. Tulamben Beach.
- Photo 13. Ricefield in Karangasem.
- Photo 14. Shrimps hatchery in Denpasar.
- Photo 15. Seaweed culture in Lembongan.
- Photo 16. Gill netters mending their gear.
- Photo 17. A grouper inhabiting a healthy coral reef.
- Photo 18. Sand mining in Lembongan.
- Photo 19. Pontoon structure damages coral reef in Nusa Penida.
- Photo 20. Mangrove area converted into rubbish dumpsite in Suwung, Denpasar.
- Photo 21. Dumping of solid waste leading to pollution of Tukad Badung.
- Photo 22. Beach erosion in Padang Galak.
- Photo 23. Beach erosion in Padang Galak.
- Photo 24. Stakeholders meeting in Klungkung.
- Photo 25. Communication forum in a village.
- Photo 26. Rubbish dumpsite in Suwung, Denpasar.

## LIST OF ACRONYMS AND ABBREVIATIONS

BAPEDAL	: <i>Badan Pengendalian Dampak Lingkungan</i> – The National Agency for Environmental Impact Management
BAPEDALDA	: <i>Badan Pengendalian Dampak Lingkungan Daerah</i> – The Local Agency for Environmental Impact Management
BAPPEDA	: <i>Badan Perencanaan dan Pembangunan Daerah</i> – The Regional Planning and Development Board
CBD	: Convention on Biological Diversity
CLC	: International Convention on Civil Liability for Oil Pollution Damage
CITES	: Convention on International Trade in Endangered Species of Wild Fauna and Flora
EIA	: Environmental Impact Assessment
GDP	: Gross Domestic Product
ICM	: Integrated Coastal Management
IIMS	: Integrated Information Management System
KEP	: <i>Keputusan</i> – Decree
MARPOL	: International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978
MENKLH	: <i>Menteri Negara Kependudukan dan Lingkungan Hidup</i> – The State Minister of Population and Environment
MENLH	: <i>Menteri Negara Lingkungan Hidup</i> - The State Minister of Environment,
NGO	: Non Governmental Organization
PEMSEA	: GEF/UNDP/IMO Regional Programme on Partnerships in Environmental Management for the Seas of East Asia
UN	: United Nations
UNCLOS	: United Nations Convention on Law of The Sea, 1982
UNFCCC	: United Nations Framework Convention on Climate Change, 1992
WWF	: World Wildlife Fund

## FOREWORD

### Role of Bali Coastal Strategy

The Coastal Strategy for the southeastern coast of Bali is an expression of hope by and for the people of Bali. This area has been a source of food, livelihood and recreation for the Balinese people, and has intermingled with their rich culture and traditions. The strategy provides a common vision where all concerned stakeholders have charted a common course - a prosperous and peaceful place for all Balinese guided by the 'Tri Hita Karana' philosophy, which balances spiritual development, economic growth and environmental protection.

The coastal strategy is a working document that describes the socioeconomic conditions, cultural setting and environmental aspects of Bali. It also illustrates how the people value these assets, and what their perceived threats to these assets are. The threats to these values are multi-faceted, therefore, the combined efforts of all stakeholders would be necessary in addressing them. The knowledge and concerns of the people shall then be translated into concrete actions. This endeavor is particularly challenging as it would entail changing people's behaviors and attitudes.

This document presents a comprehensive environmental management framework. There are targeted outcomes and action programs involving the participation of stakeholders from government, nongovernment organizations, private sector and civil society groups. The implementation of these action programs by the concerned stakeholders will lead to the realization of the common vision. Partnership, therefore, is a key to the attainment of the vision.

In this regard, the Coastal Strategy of the Southeastern Coast of Bali will promote the realization of sustainable development in Bali by:

1. Providing an integrated policy framework for coastal environmental management, which identifies the key roles for all sectors of society, including central and local governments, local communities, private sector, civil society groups, academic and research institutions, as well as UN and donor agencies and other multilateral financing institutions;
2. Linking economic planning and development programs to environmental and resource management goals;
3. Integrating social issues, such as poverty alleviation, food security, youth development, well-being of indigenous communities and marginalized groups of society, with the sustainable development of coastal and marine resources; and
4. Encompassing terrestrial- and sea-based human activities which impact on the coastal and marine environments.



## **Scope of the Bali Coastal Strategy**

The geographical coverage of the coastal strategy includes the surface area of the southeastern coast of Bali, which is about 3,350 km<sup>2</sup>, and the surrounding watershed area of some 1,790.8 km<sup>2</sup>. The 219 km coastline covers one municipality (Denpasar) and four regencies (Badung, Gianyar, Klungkung and Karangasem), excluding four small islands (Nusa Penida, Lembongan, Ceningan and Serangan). There are 13 rivers that drain into the southeastern coast, which contribute substantially to the pollution in the bay. The seaward boundary is coastal waters from shoreline of the above municipality/regencies up to a distance of four miles from the shoreline.

The strategy covers human activities and/or processes, which have impact on the coastal and marine environments. These include activities in the uplands going down to the lowlands and marine areas, such as forestry, agriculture, mining, coastal industry and human settlement.

There is no prescribed timeline identified in the coastal strategy as it serves as a long-term policy and strategic framework of marine and coastal resources management. The stakeholders themselves, who are the owners of the strategy, shall determine the pace of attaining the shared vision based on their planning and implementation of the action programs. The adoption and implementation of specific action programs shall be facilitated through the development of specific action plans. The implementation of the coastal strategy shall require the highest level of commitment and political will of the Bali people, as well as their genuine aspiration for the sustainable development of the Bali coast.



**Hon. Dewa Beratha**  
Governor, Provincial Government of Bali  
Chairman, Project Coordinating Committee



## ACKNOWLEDGMENTS

The Coastal Strategy for the Southeastern Coast of Bali was developed through a series of consultations and approval procedures. District-level consultations were held in Badung, Denpasar, Gianyar, Klungkung and Karangasem from 23 April to 3 May 2001, which ended with an area-wide consultation on 28 May 2001.

Appreciation is extended to those who participated – people who care about Bali's environment and believe in sustainable coastal development coming from various sectors of the society. These concerned stakeholders included fishers, farmers, private entrepreneurs, local legislative assembly members, government officials, religious groups and traditional village groups, members of research and academic institutions, NGOs, and other civil society groups in Badung, Denpasar, Gianyar, Klungkung and Karangasem.

Special thanks are due to officers of BAPEDALDA Bali Province, BAPEDALDA of Badung, Environmental Sector of Denpasar, BAPPEDA of Gianyar, Klungkung and Karangasem for their technical and logistical support in organizing the stakeholders consultation workshops.

We are also grateful to the staff of GEF/UNDP/IMO PEMSEA Regional Programme Office for their invaluable assistance in developing and reviewing the Coastal Strategy for the Southeastern Coast of Bali.

Most of all, we thank the people of Bali to whom this coastal strategy is sincerely dedicated.

Denpasar, February 2002



Project Management Office  
National ICM Demonstration Project in Bali, Indonesia



- Kota Denpasar
- Kabupaten Badung
- Kabupaten Klungkung
- Kabupaten Gianyar
- Kabupaten Karangasem

# The Southeastern Coast of Bali

## **The Southeastern Coast of Bali**

The province of Bali is world-renowned as one of the best tourist destinations. These beautiful island groups, surrounded by seas that offer many fabulous dive sites and a culture rich with rituals, were established as a province pursuant to Act Number 64 in 1958. Geographically, it consists of Bali Island as the mainland, and the small islands of Nusa Penida, Lembongan, Ceningan, Serangan, and Menjangan. Bali Island is bordered by Java Sea to the north, Lombok Straits to the east, Indian Ocean to the south and Bali Straits to the west.

The currents in the southeastern coast of Bali are very much influenced by the movements of water mass during high/low tide in Badung Strait and the Indian Ocean. The tide patterns in southeastern coast of Bali are similar to that of Indian Ocean where there is a mixture of dominant multiple low tides. Beaches in Bali are formed by river sediment, limestone, volcanic ash and other types of sediments. Most of the beaches are characterized by black sand due to terrigenous and volcanic processes. Several beaches that have white sand are formed by calcareous and siliceous processes of rock fraction, alga coralines and organism skeletons.

The physical and geological features of the southeastern coast of Bali, combined with biogeochemical processes, have contributed to the high species diversity and rich marine habitats, such as mangrove swamps, coral reefs and seagrass meadows. The extensive 1,373.5 ha of mangrove areas are found along Benoa Bay (Badung and Denpasar) and 202 ha in Lembongan Island (Klungkung), all of which account to 52.41 % of the total mangroves in Bali. Coral reefs are found in Nusa Penida, Ceningan, Lembongan islands, Nusa Dua, Serangan Island, Sanur, Amuk Bay and Candidasa. The biophysical condition of this reef ecosystem is very much influenced by local factors. Seagrass meadows are found in the eastern part of Nusa Dua, Sanur, Serangan Island, and Lembongan. The distribution of seaweed is similar to that of seagrass meadows and coral reefs.

Three main river watersheds flow to the southeastern coast: Ayung, with a total area of 303 km<sup>2</sup>; Oos, with a total area of 116.52 km<sup>2</sup>; and Unda, with a total area of 220.52 km<sup>2</sup>. Other rivers flowing to southeastern coast are Tukad Mati, Tukad Badung, Tukad Petanu, Tukad Pakerisan, Tukad Melangit, Tukad Bubuh, Tukad Jinah, Tukad Kerkul and Tukad Bedih.

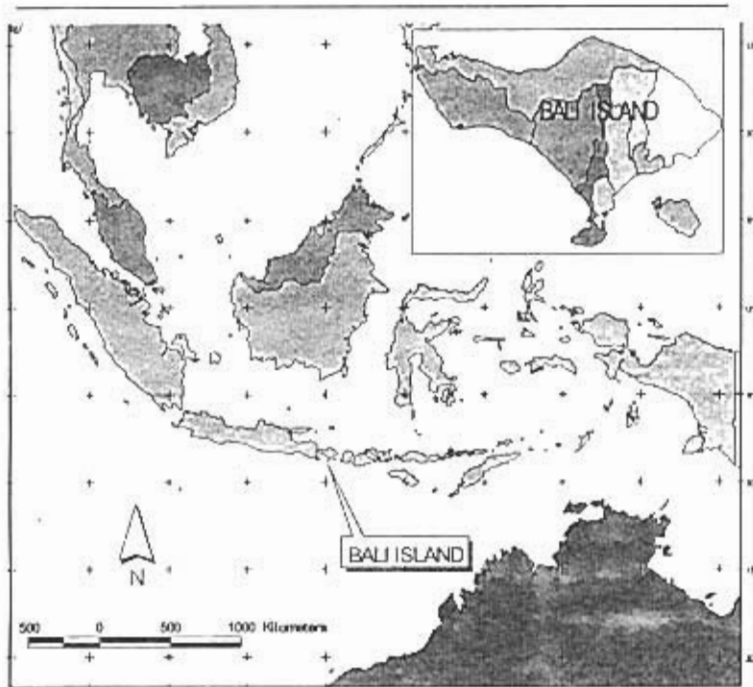


Figure 1. Bali Island is the site of a national ICM demonstration project Indonesia.

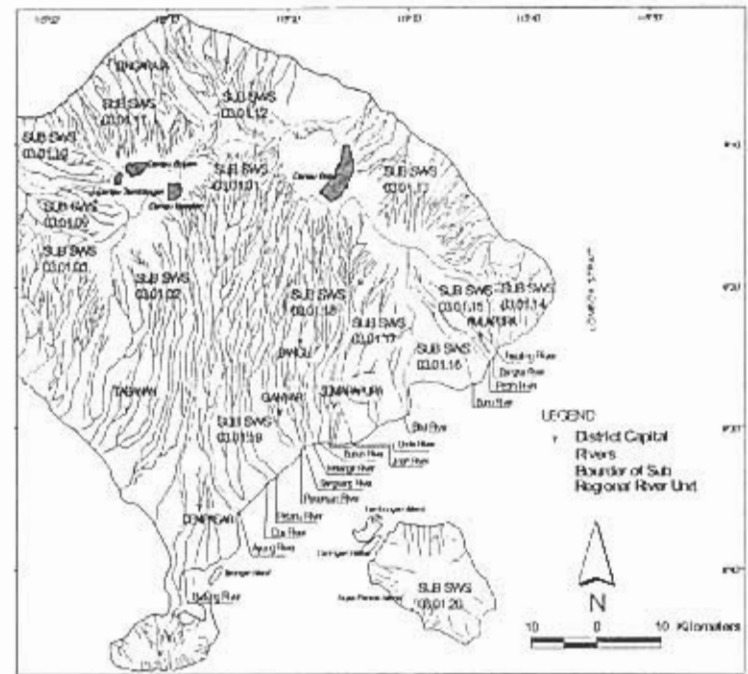


Figure 2. Map of rivers in Bali.



# Balinese People and Their Culture

## Balinese People and Their Culture

The southeastern coast of Bali has a total population of 1,768,921 (2000) with a population density of 857 people/km<sup>2</sup> (figure 3) and a growth rate of 1.84% per year. In the past thirty years, there has been a continuing migration of the population from rural to urban areas. The target areas of urbanization are Denpasar, Badung and Gianyar. The educational level of people up until 1999 was still considered low given the level of education attained by majority of the population: primary school (29.28%), junior high school (13.63%), senior high school graduated (18.84%) and college/university (3.31%) (Badan Pusat Statistik, Propinsi Bali, 2000).

Due to rapid development of the tourism sector, the high rate of employment from 1977–1999 was absorbed by trade, hotel and restaurant sectors. These tourism businesses are mostly located in coastal areas. In the secondary sector such as industry, there has been a slower growth rate. In 1999, this sector employed 256,255 people or 15% of the total employment (BAPPEDA Propinsi Bali, 1999).

The majority of Balinese people are Hindu (92.5%) while minority groups are Muslim (5.6%), Buddhist (0.6%), Protestant (0.7%) and Catholic (0.5%) (BAPPEDA Propinsi Bali, 1999). For Balinese Hindus, religion and culture are two inseparable entities closely linked in harmony. Religious ceremonies associated to beaches and coastal areas are as follows:

- Candi Narmada Ceremony - the ocean is considered to have the elements to purify and dissolve all kinds of impurities.
- Melasti Ceremony - the purpose is to purify the universe by symbolically taking the elixir of life from the ocean.
- Nyegara Gunung Ceremony - the purpose is to notify the god of ocean, *Baruna*, that the whole ceremonial processes have been completed.
- Nganyut Ceremony - part of the cremation ceremony, which is the purification of the soul of a cremated person.
- Mulang Pekelem - the essence of the ceremony is to request for safety and prosperity of the universe and humankind from the god by controlling the oceans so that the land will be fertile, plantations will grow well and people will be prosperous.
- Banyu Pinaruh - the ceremony conducted in beaches mostly by students to celebrate Sang Hyang Aji Saraswati (goddess of knowledge).
- Ngangkid, Melukad and other ceremonies - these are normally conducted in the estuaries, the places believed to be able to purify various forms of spiritual impurities.
- Religious ceremonies conducted by fishers - the offerings are normally put right into the sea, conducted during *tumpek landep* and *tumpek bubuh* of the second (*sasih karo*) and sixth (*sasih kenem*) according to the Balinese calendar. In *sasih enem*, Pekelem ceremony is performed right in the oceans followed by sailing around *Serangan* Island in order to drive away all evil spirits.
- Nyepi for fishers - this is characterized by not performing any work in the ocean including traveling.

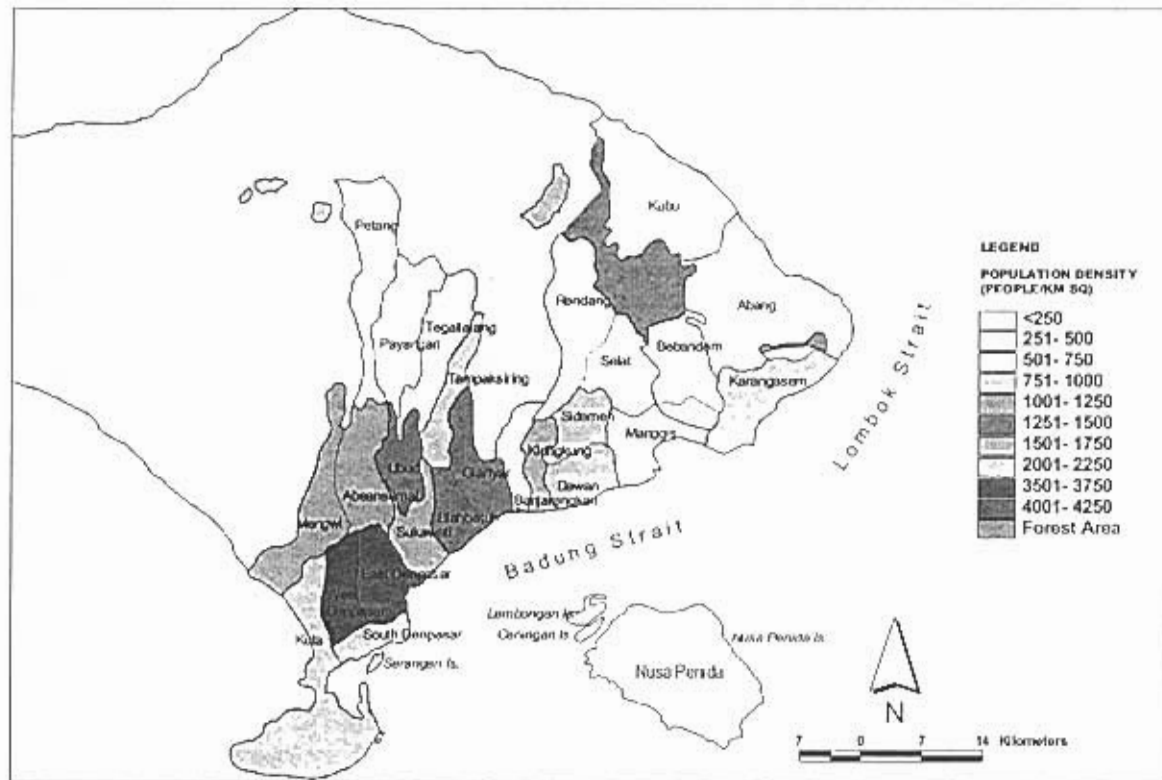


Figure 3. Population density in the southeastern coast of Bali.



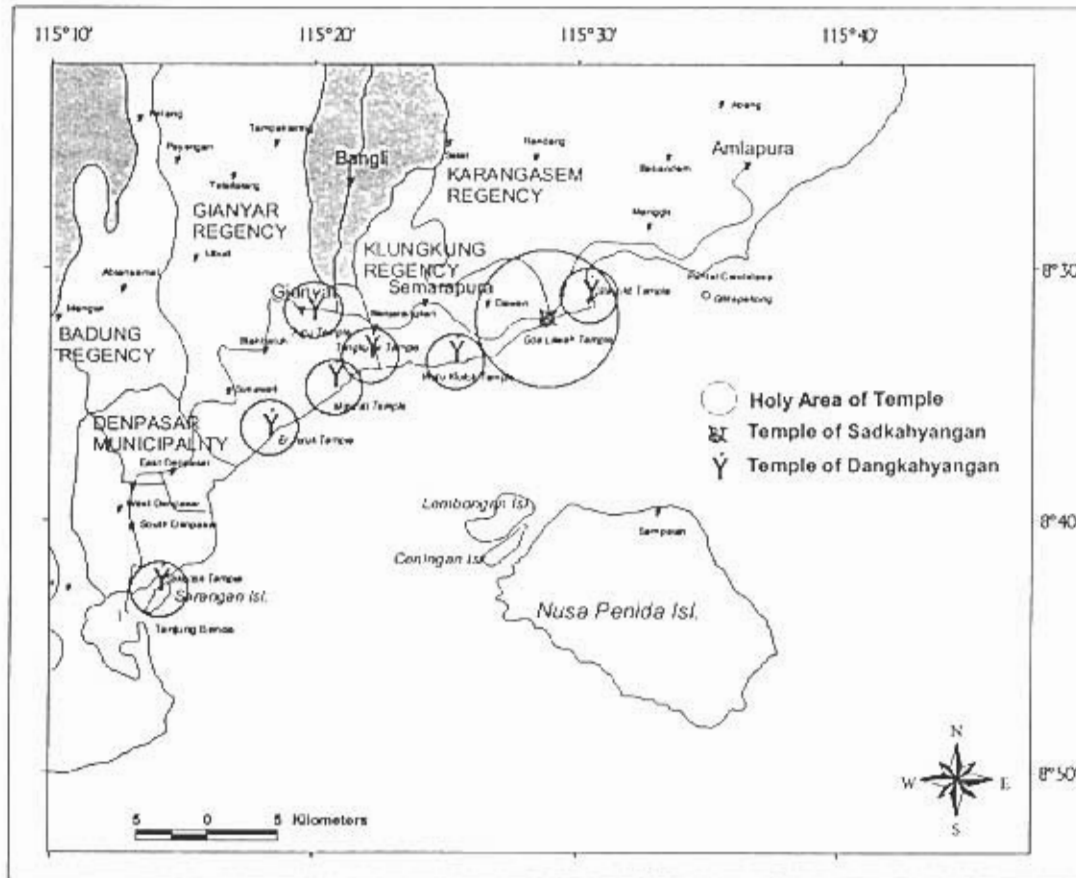


Figure 4. Location of temples in the southeastern coast of Bali.



Photo 1. *Mulang Pekelem* (religious ceremony) in Lebih Beach .

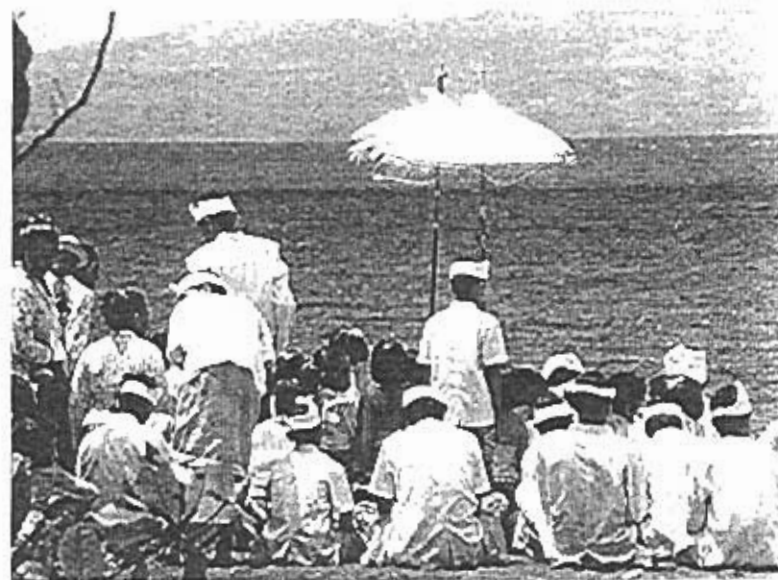
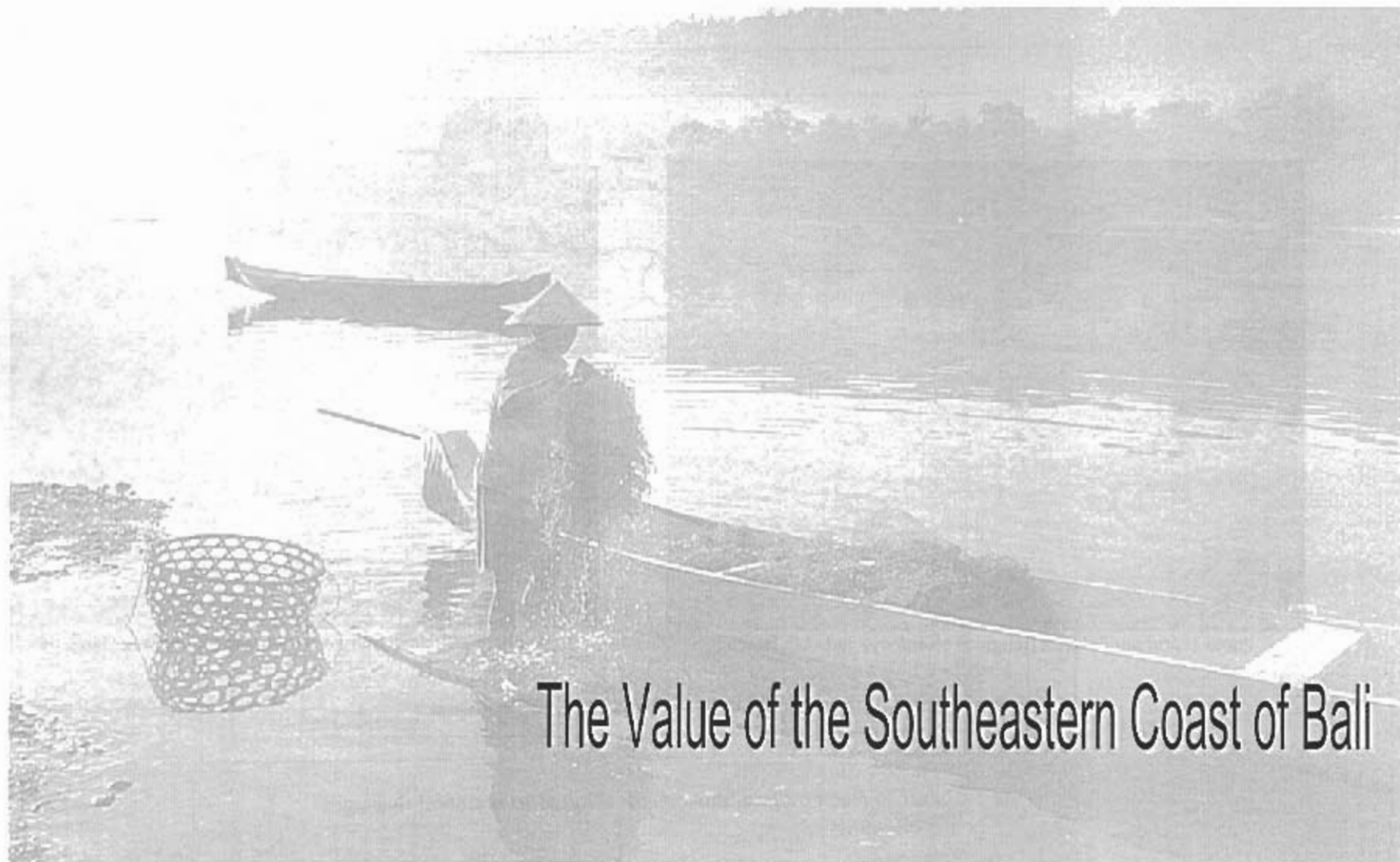


Photo 2. *Melasti* (religious ceremony) in Padang Galak Beach.



## The Value of the Southeastern Coast of Bali

## The Value of the Southeastern Coast of Bali

There are numerous coastal resources that provide highly significant values to the social and economic development of Bali. Developments in Bali are linked with the condition of terrestrial environments and coastal ecosystems. Detailed information on the values of each regency and municipality is listed in Appendix 1.

### Historical and Cultural Values

By tradition, some mountains, lakes, estuaries, beaches and seas are considered sacred places. Hence, many temples and religious activities are found along the southeastern coast (figure 5). Once a year, Balinese Hindus purify the universe by symbolically taking elixir of life from the ocean through ceremonies known as "*melasti*". The ceremonies take place at several locations in each regency and municipality. In addition, many archaeological and cultural sites are found in the southeastern coast of Bali (figure 6).

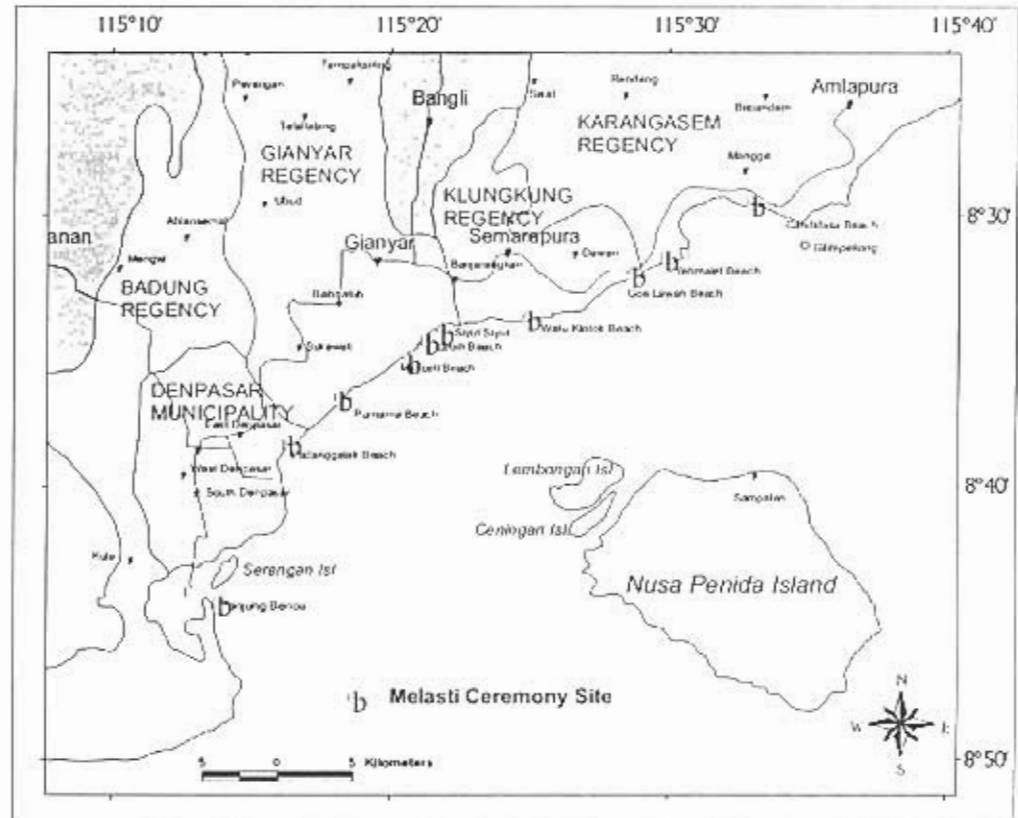


Figure 5. Sites for Hindu *Melasti* (religious) ceremonies.

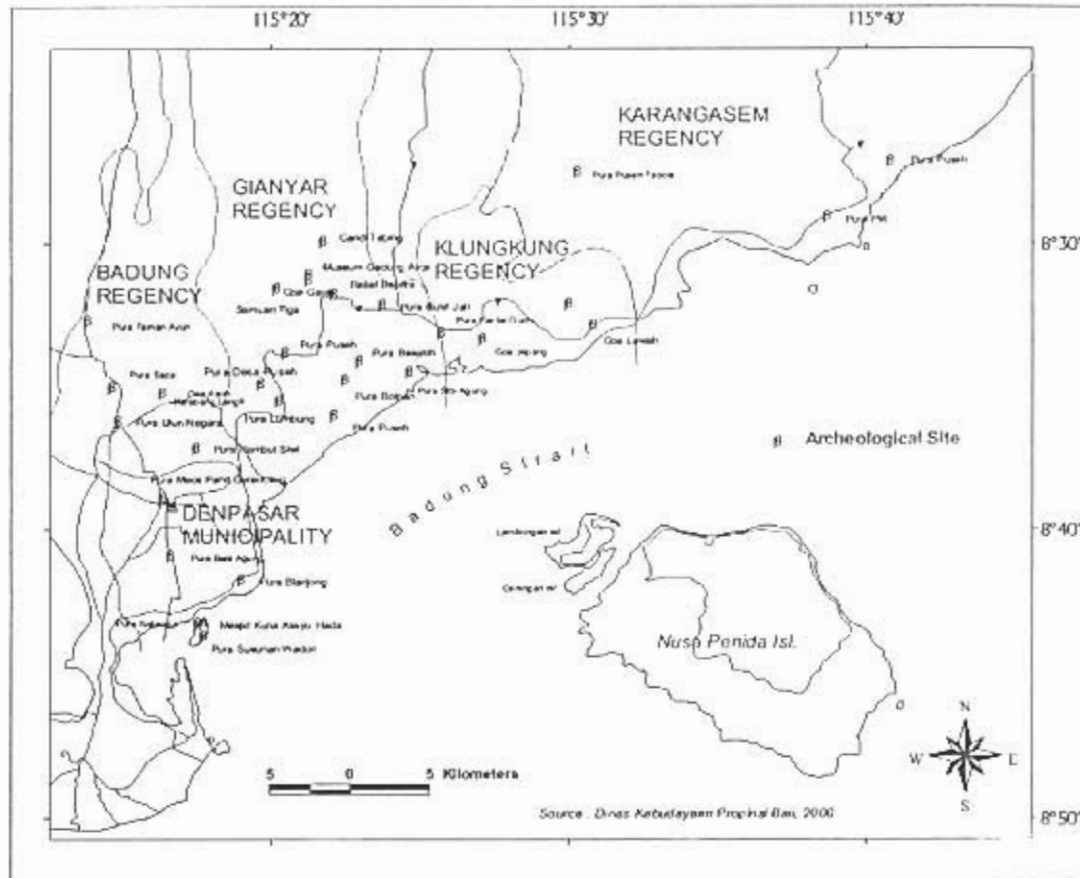


Figure 6. Archaeological sites in the southeastern coast of Bali.

## Natural Values

The total mangrove area in the southeastern coast is 1,575.5 ha (1,373.5 ha in Benoa Bay and 202 ha in Lembongan Island). This represents 52.41% of the total mangroves in Bali. The mangrove in Lembongan Island was declared as a National Forest Park in 1993. Dominant species in Benoa is *Sonneratia alba*, while other genera include *Rhizophora*, *Avicennia* and *Bruguiera*. In Lembongan Island, the mangrove forest has been established as a conservation forest. The dominant genus is *Rhizophora*.

Coral reefs can be found in the islands of Nusa Penida, Ceningan, Serangan and Lembongan. In the mainland, corals are located in Nusa Dua, Sanur, Amuk and Candidasa.



Photo 3. Coral reef in Nusa Dua Beach.



Photo 4. Mangrove forest in Lembongan.

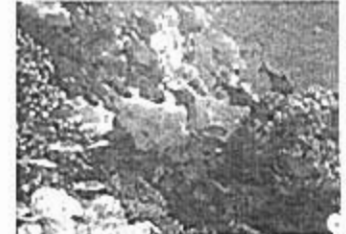


Photo 5. Reef fishery in Nusa Dua.



Photo 6. Seagrass bed in Nusa Dua.



Photo 7. Turtle nursery in Lembongan.

Seagrass meadows are found in the eastern part of Nusa Dua and Sanur, as well as in Serangan and Lembongan Islands. Most seagrass in Lembongan has been depleted due to seaweed cultivation. The five genera of seagrass found in this area are *Zostera* (most dominant), *Cymodocea*, *Syringodium*, *Enhalus* and *Thalassia* (Regional Planning Development Board of Bali Province, 1998/1999). In some areas, such as Lembongan Island, seagrass grows in conjunction with corals and mangroves.

Lagoon ecosystems, characterized by shallow water in the littoral zone separating beach areas and corals, are found in Sanur and eastern part of Nusa Dua. Sanur lagoon stretches from Sanur beach in front of Ananda Hotel to Mertasari beach, with substrates consisting of sand, coral rubble, rocks, seagrass and algae. In Nusa Dua Lagoon, the substrates consist of sand and rubble and small colonies of live corals (Koba, 1993).

### **Tourism and Recreational Values**

A tourism-based economy has contributed to no less than 30% of Bali's GDP (Statistical Bureau Agency of Bali Province, 2000). Such GDP contribution did not fluctuate significantly even during the economic crisis in 1998. Following the tourism sector are agriculture, forestry and fishery, which collectively contributed 19.5% of Bali's GDP in 1999. The southeastern coast of Bali is regarded as the center of marine tourism. Due to various places of interests, the activities developed in this area include diving and snorkeling, and other water sports (e.g. banana boat, jet ski, surfing, parasailing, canoeing, sailing, dolphin watching, surfing, ocean rafting and recreational fishing). Bottom-glass boat and semi submarines are also available to enjoy underwater views.

The phenomenal growth of tourism in Bali has been supported by the construction of the Ngurah Rai Airport, the development of hotels and restaurants, and other tourism promotional activities. In 1968, the number of overseas visitors totaled to 5,765 people. This increased to 1,310,549 visitors by the end of 2000 (figure 7).

According to Local Government Regulation Number 4 (1999) regarding spatial planning, 15 areas have been designated as tourism areas throughout the province. Of this total, only one area (Ubud) is not coastal. Nine tourism areas are located along the southeastern coast, namely Nusa Dua, Kuta, Tuban, Sanur, Lebih, Nusa Penida, Candidasa, Ujung and Tulamben. The tourism areas are much supported by the existence of coastal ecosystems, such as mangroves and coral reefs, and the traditional Balinese culture.





Source: Dinas Pariwisata  
Propinsi Bali (1999)

Figure 7. Tourist arrivals in Bali in 1968-1999.



**KUTA:** Kuta Bay, with its long stretch of white sand and brilliant sunset, has attracted swarms of visitors since its rediscovery by surfers and sun worshippers in the 1970s.

**NUSA DUA:** The beautifully-landscaped beach resort of Nusa Dua is home to no less than 15 five-star resort hotels, the 18-hole Bali Golf & Country Club and an excellent shopping center.

**NUSA LEMBONGAN:** A small island popular for its white sand beaches and slow pace of life. Several cruise operators offer day-trips from Benoa Harbour.

**SANUR:** This resort area has expanded around Bali's largest traditional village and today boasts of excellent facilities for international visitors.

**TULAMBEN:** Some of Bali's most interesting dive sites are found at Tulamben, where the shallow wreck of a World War II US cargo ship is now ornamented with colorful corals and schools of tropical fish.



Photo 9. Nusa Dua.



Photo 10. Nusa Lembongan.



Photo 11. Sanur Beach.



Photo 12. Tulamben Beach.

## Settlement and Development Areas

Agricultural activities in Bali are generally conducted using simple technology either for land preparation, harvest or post-harvest. Most farmers have small-scale land areas that are less than 0.5 ha. This sector is less profitable for economic development. Over the past five years, the contribution from the agricultural sector has declined. It was only 0.85% of the GDP in 1999, compared with more than one percent during the previous years. The total agricultural area of Badung, Denpasar, Gianyar, Klungkung and Karangasem is 139,669 ha consisting of 41,789 ha ricefields, 36,479 ha plantation and 61,401 ha dry/mixed farming.

Most industries are classified as small-scale and handcraft, with a limited number of medium-scale industries. The contributions of these small- and medium-scale industries to the GDP over the last five years is about 10%. Both small-scale industries and handicrafts play a very important role in generating foreign currency. Centers of small-scale and handcraft industries are in the subdistricts of Gianyar, Klungkung and Mengwi as well as Denpasar City. Tulamben Beach in Karangasem Regency is one of the industrial zones.

Shrimp/prawn hatcheries are of high potential aquaculture activities. Presently, aquaculture activities occupy about 23% of the total available area (Dinas Perikanan Daerah Tingkat I, Bali, 1999), of which seaweed cultivation is mostly dominant (*Eucheuma cottonii* and *Eucheuma spinosum*) particularly in areas such as Nusa Penida sub-district, Serangan Island and Nusa Dua. This industry employs 123,225 people in Klungkung and 21,000 people in Badung.



Photo 13. Ricefield in Karangasem.

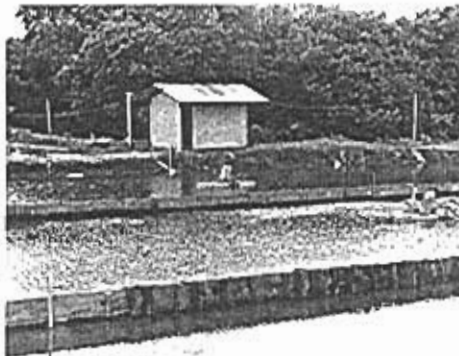


Photo 14. Shrimp hatchery in Denpasar.



Photo 15. Seaweed culture in Lembongan.

Traditionally, the fishery resources serve as food sources especially for people living in the coastal and near shore areas. Private investment in the fishery sector has enjoyed rapid growth in Bali, particularly in Denpasar and Badung. In 1998, fisheries export amounted to US\$ 99,758,075. In 1990, the fishing industry in Bali involved 11,586 households. This number increased to 17,215 households by 1999 (Fishery Sector of Bali Province, 1990 and 1999).



Photo 16. Frozen tuna fish for export.

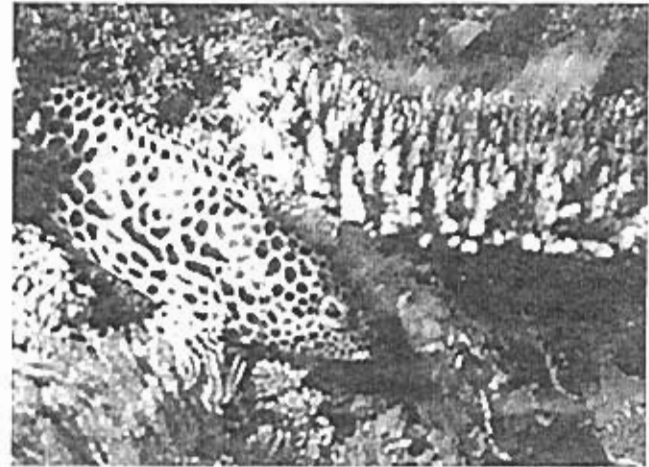


Photo 17. A grouper inhabiting a healthy coral reef.

Coastal resources, particularly coral reefs, may provide significant value for medicine. Several chemical and pharmaceutical studies in the past three decades have revealed that invertebrates, such as sponges, soft corals and tunicates are important sources of biologically active substances. These could be potentially developed into new drugs and other useful products (Higa, 1997). Hence, these marine organisms in Bali, that have no commercial value today, should be properly conserved as possible sources of medicines and biochemical reagents in the future.

Mining activity is concentrated on sand, rocks, limestone, andesite and gravel all classified as type C activities. Most of the mineral reserve materials are found in Karangasem. Klungkung Regency is the largest sand and gravel producing area.



Photo 18. Sand mining in Lembongan.

Classification of mining activities according to Act Number 11 Year 1967:

**Type A** : Strategic mining includes oil, gas, coal, uranium and tin.

**Type B** : Vital mining includes gold, silver and zinc.

**Type C** : Excluding Type A and Type B includes sands, rocks, gravel, limestone, marbles, dolomite and granite.

Bali has four sea harbors: two harbors (Benoa in Denpasar City and Padangbai in Klungkung Regency) are located in the ICM project area. Benoa Harbor is used for international as well as local trading purposes with multiple functions to serve passengers, cargo, goods, tourism and fishing. The harbor has a terminal that can accommodate 800 people and a container terminal of 6,400 m<sup>2</sup> (BAPPEDA Propinsi Bali, 1999). For fishing-related purposes, the harbor is equipped with a 150m concrete wharf and a 225 m wooden one. Padangbai Harbor only caters to ferries serving the Padangbai (Bali) to Lembar (Lombok, West Nusa Tenggara).



# Threats and Their Impacts

## Threats and Their Impacts

Extensive utilization of marine and coastal natural resources has created a number of serious problems for the southeastern coast of Bali. These problems include destruction of coastal ecosystems, declining environmental quality and multiple-use conflicts. Various development activities have resulted in destruction of coral reefs, mangroves and seagrass meadows. These have serious implications concerning the maintenance of Bali's ecological, recreational and production values.

Pressures on coral reefs, on the other hand, are due to destructive fishing, unmitigated recreational activities and infrastructure development. In 1997, nearly 70% of the corals were covered with green and red macro algae (Bali Beach Conservation Project, 1998). Reef Check 2000, conducted by WWF Wallacea Bioregion Program, showed a high death rate (21%) at three-meter depth of the coral reefs located at the south of Grand Bali Beach Hotel. This indicates mechanical pressure and/or physical destruction given that the coverage of coral rubbles at this depth level is relatively high at 31%. Illegal fishing practices, such as use of explosives, have destroyed coral reefs in Nusa Penida and Karangasem Regency. Marine tourism establishments also contribute to reef destruction, as many of these facilities were built without appropriate environmental safeguards.



Photo 19. Pontoon structure damages coral reef in Nusa Penida.



Photo 20. Mangrove area converted into rubbish dumpsite in Suwang, Denpasar.



The pressure on the mangrove forest in Benoa is greatest due to its strategic location - between major resort areas of Sanur and Nusa Dua, as well as between two main entry points of Ngurah Rai Airport and Benoa Harbor. Coupled with population growth, this mangrove forest is threatened by the construction of tourism facilities and other commercial infrastructures. Such constructions have already resulted in a high rate of sedimentation.

The indirect ecological and economic benefits of seagrass beds are not fully appreciated. Hence, much of these resources have been depleted in Lembongan Island. Nearly 80% of seagrass beds around Serangan Island were destroyed due to seaweed cultivation, which started in 1964, and as a consequence of reclamation projects in 1994 (ICM Bali, 2000). Destruction of seagrass beds, which serve as nursery for juvenile fishes, may have contributed to a sharp decline of fish production over the past 15 years. This in turn impacted negatively on the livelihood of local people. Many fishers using traditional boats and gears have lost their jobs due to the decline in their catch of fish, lobsters and crabs.



Photo 21. Dumping of solid waste leading to pollution of Tukad Badung.



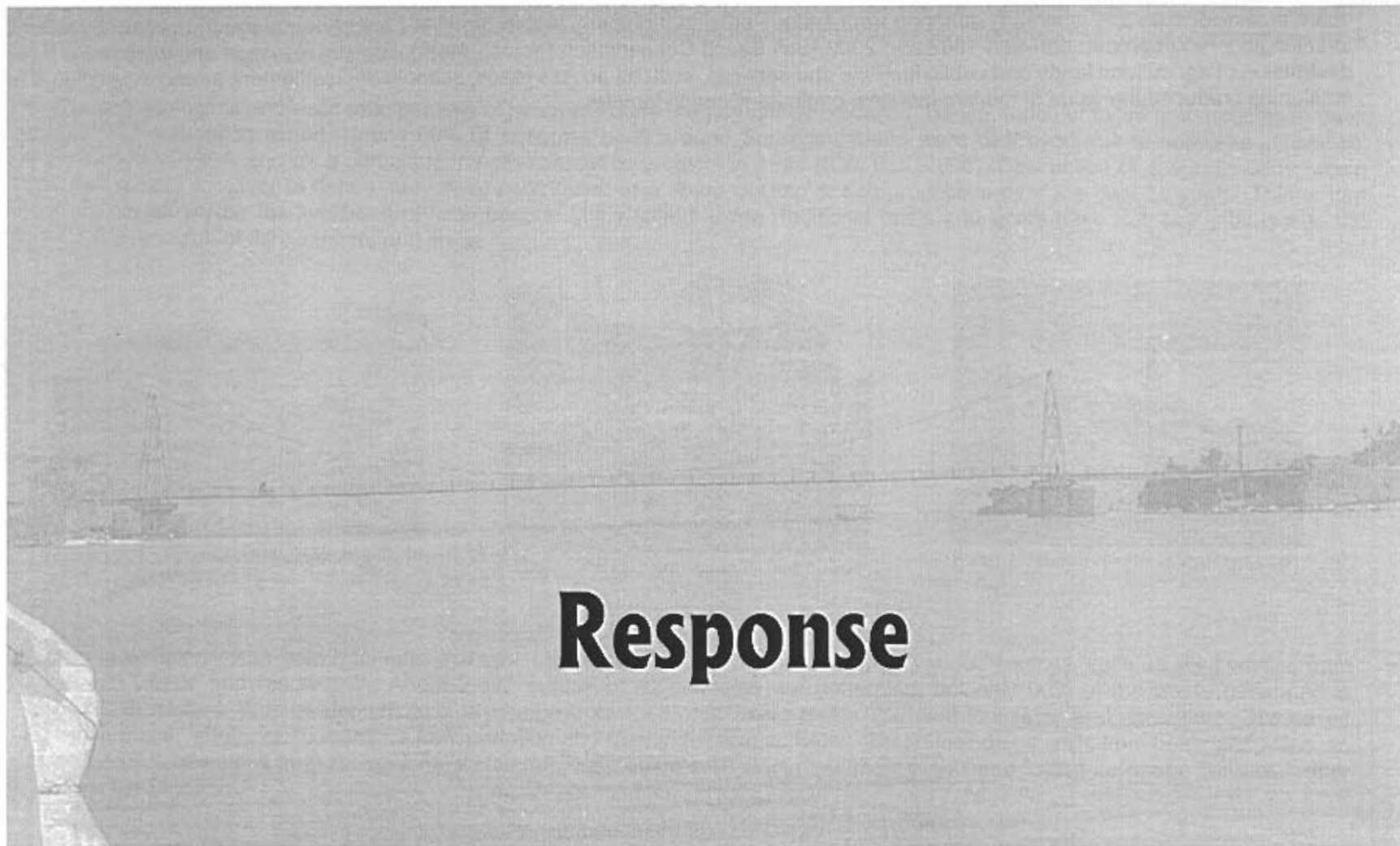
Photo 22. Beach erosion in Padang Galak.



Photo 23. Beach erosion in Padang Galak.

Sources of pollution come from both land and sea. Land-based pollution emanates from various sources, such as solid wastes from households, hotels and restaurants. About 2,097 m<sup>3</sup>/day of solid wastes are generated, but only 60% of the waste generated is collected and treated. Wastewater effluents discharge from food processing plants, garment industries and agriculture. Sea-based pollution is mainly attributed to maritime transportation and marine tourism activities. These include oil spills from boats and ships, as well as dumping of wastes from recreational watercraft. Inadequate solid waste treatment plants and limited sewerage facilities further aggravate the problem.

Another key issue is beach erosion, which may be attributed to both natural and anthropogenic sources. A total of 52 km (12%) of the entire provincial coastline is already suffering from serious erosion problems. Within the ICM Project boundary, 37.1 km of beach out of total length 219 km eroded between 1962 and 2000 (Bali Beach Conservation Project, 1998). Erosion results in economic losses due to destruction of agricultural lands and public facilities and services, such as access roads, schools and settlement areas. In addition, beach erosion has reduced the value of tourism facilities, particularly beach temples.



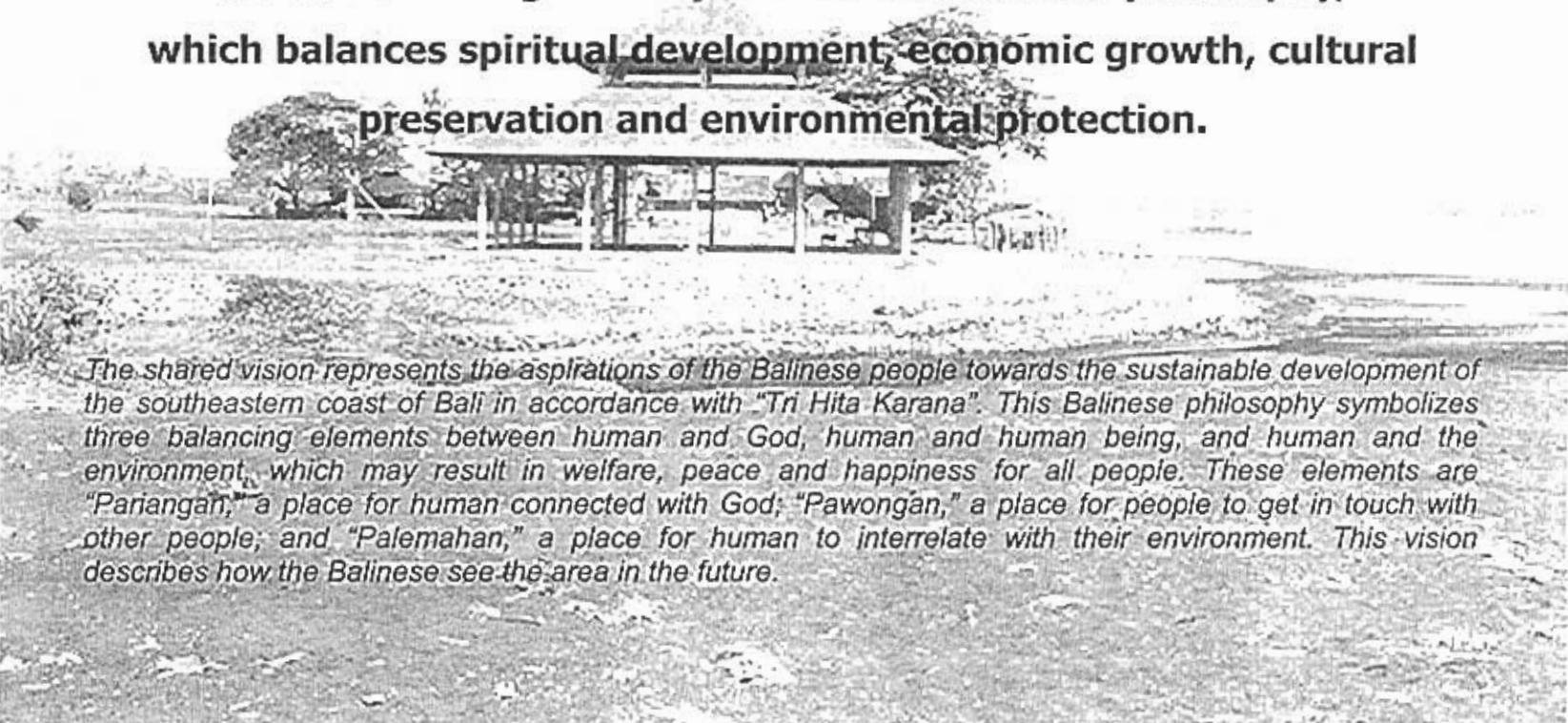
# **Response**



## Vision and Mission

## Vision

**The Southeastern Coast of Bali is a prosperous and peaceful place for all Balinese guided by the 'Tri Hita Karana' philosophy, which balances spiritual development, economic growth, cultural preservation and environmental protection.**



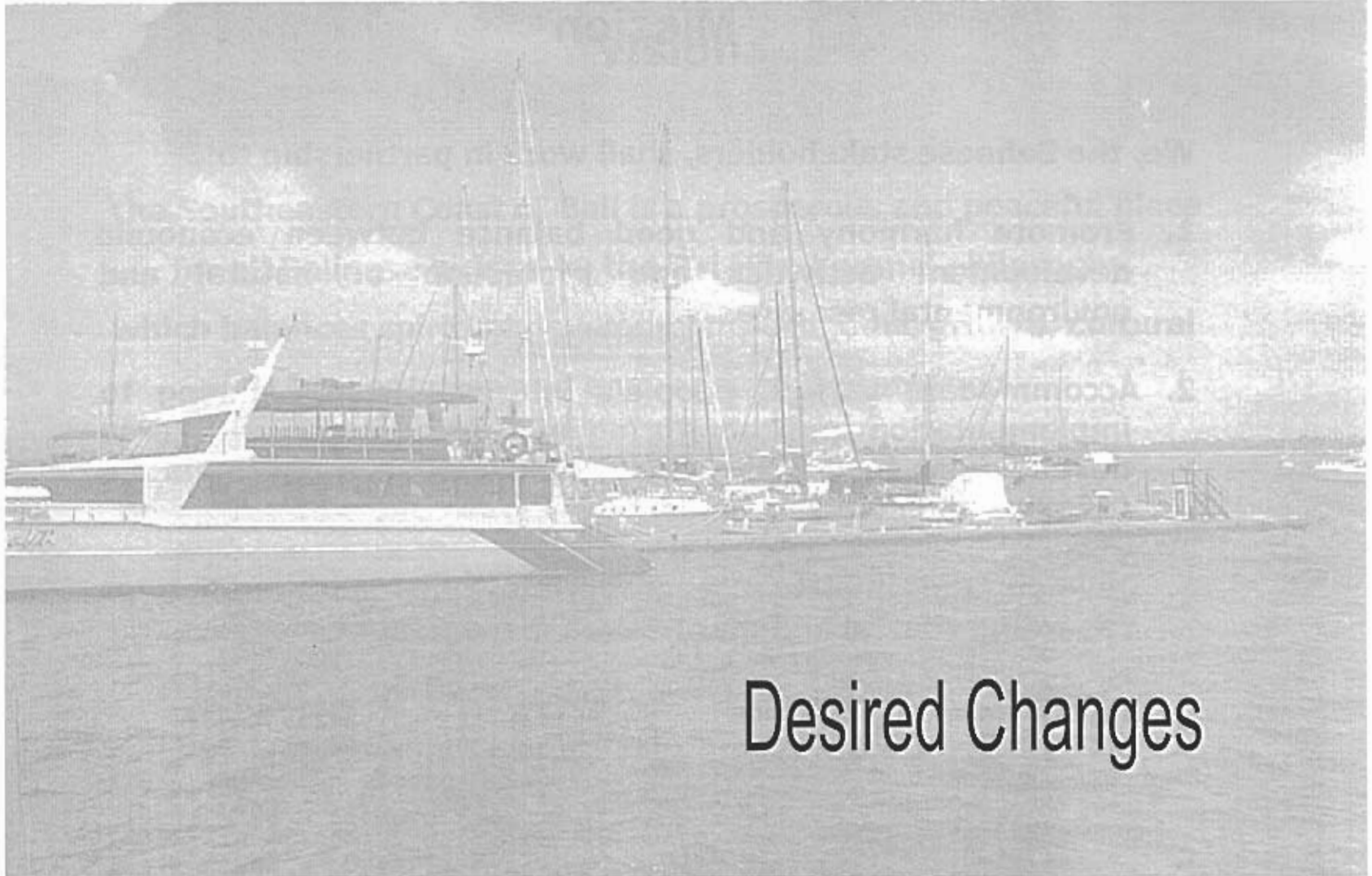
*The shared vision represents the aspirations of the Balinese people towards the sustainable development of the southeastern coast of Bali in accordance with "Tri Hita Karana". This Balinese philosophy symbolizes three balancing elements between human and God, human and human being, and human and the environment, which may result in welfare, peace and happiness for all people. These elements are "Pariangan," a place for human connected with God; "Pawongan," a place for people to get in touch with other people; and "Palemahan," a place for human to interrelate with their environment. This vision describes how the Balinese see the area in the future.*

## Mission

**We, the Balinese stakeholders, shall work in partnership to:**

- 1. Promote harmony and good balance between economic development activities and protection of natural and environmental resources.**
- 2. Accommodate various people's interests from planning to implementation and monitoring of coastal and marine area development to improve the people's welfare and maintain religious and cultural values.**
- 3. Develop and implement appropriate rules and regulations regarding coastal and marine area management.**

*The mission statement is an affirmation of the vision. It is built on the principle of partnership among the sectors involved -- central and local governments, private sector, civil society groups, local communities, and scientific communities/academe.*



## Desired Changes



## Desired Changes and Outcomes

### Institutional

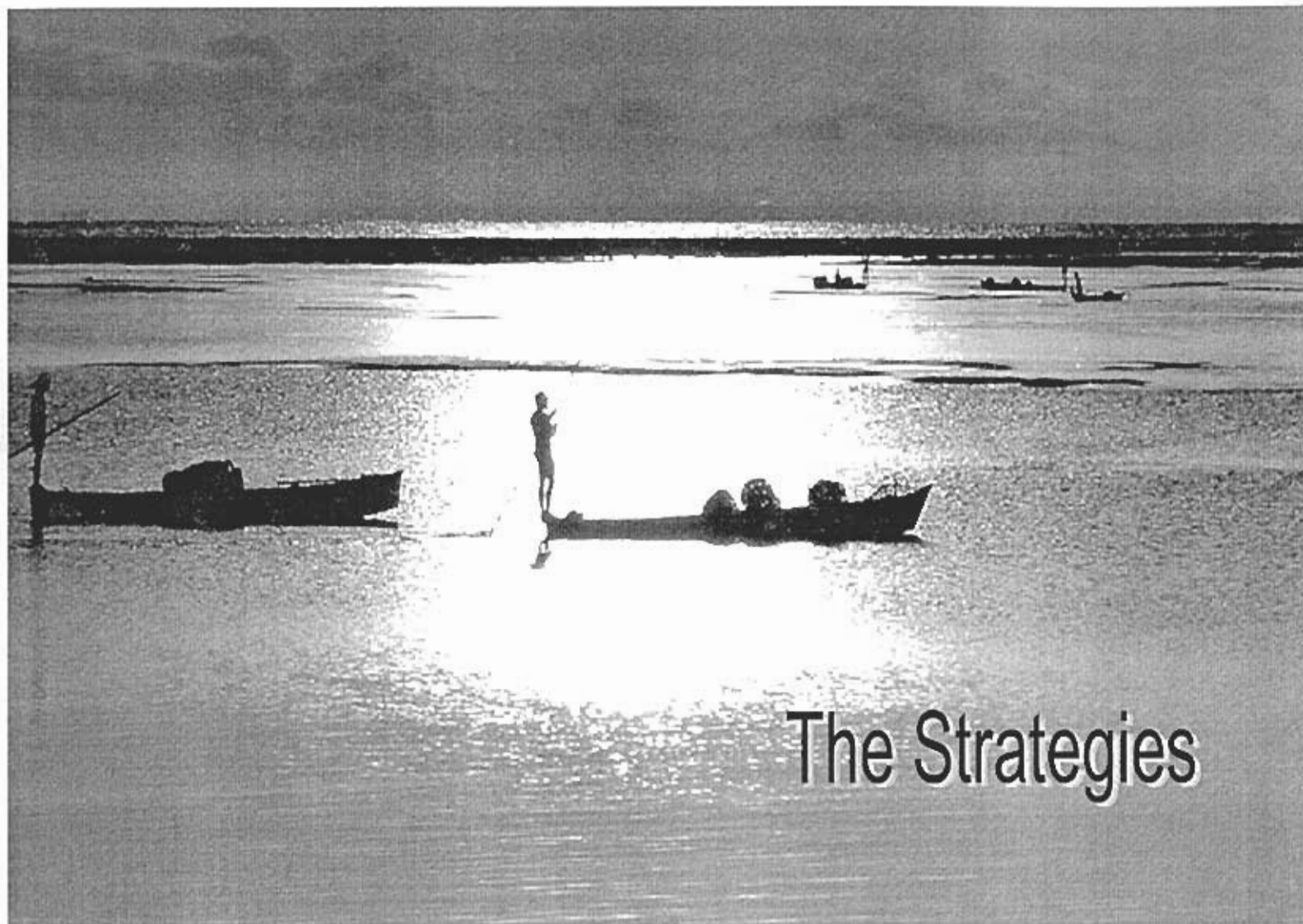
- ✦ Local interagency and multisectoral coordinating mechanism to implement coastal strategy for the southeastern coast of Bali established;
- ✦ Appropriate local and national legislation developed;
- ✦ Integrated coastal zonation plan adopted;
- ✦ Local, national and international policies and regulations on environmental management adopted, implemented and enforced; and
- ✦ Roles of traditional village groups strengthened in terms of local environmental management control.

### Operational

- ✦ Coordination and cooperation in implementing environmental programs among different institutions and sectoral agencies;
- ✦ Collaborative research and information sharing among local research and academic institutions in Bali particularly for the management of coastal and marine resources;
- ✦ Environmental programs implemented by appropriate local government units;
- ✦ Traditional village groups actively involved in marine and coastal environmental programs;
- ✦ Scientific inputs considered in forming management decisions and determining policies;
- ✦ More responsive private sectors or industrial associations contributing to marine protection and environmental conservation;
- ✦ Communication and information system available for everyone concerned with marine and coastal environment; and
- ✦ Action programs for environmental management incorporated into Bali Province development plans.

### Outcomes

- ✦ Positive change in attitude among stakeholders, including local communities, policy makers, private sector and civil society;
- ✦ Effective environmental pollution and degradation control system implemented;
- ✦ Marine ecosystems, coastal habitats and endangered species well-managed and effectively protected;
- ✦ Recreational beaches remain clean and beautiful;
- ✦ Economic status of traditional and local people improved; and
- ✦ Sacred areas and temples properly maintained.



## The Strategies

## THE STRATEGIES

Strategies specify the approaches to be undertaken to realize the vision of the southeastern coast of Bali -- a prosperous place where people live in harmony with God, one another, and their environment. Four strategies are identified as the major courses of actions needed to attain such vision:

The **COMMUNICATE** strategy addresses the issue of awareness and participation -- COMMUNICATE with stakeholders to enhance their level of awareness regarding the importance of the coastal environment and resources, as well as to elicit their active participation in coastal and marine management.

The **DEVELOP** strategy deals with improving both socioeconomic conditions and institutional infrastructures -- DEVELOP appropriate institutional and legal regimes to promote effective and integrated management of coastal and marine resources while directing economic activities and programs in suitable areas to improve the economic prosperity of the people.

The **PROTECT** strategy ensures that coastal resources and environments are not squandered in pursuit of economic development -- PROTECT coastal ecosystems and human population from risks occurring as a consequence of development activities.

The **PRESERVE** strategy is designed to maintain the integrity of key ecological and human values -- PRESERVE natural resource systems, including coastal and marine habitats and groundwater, religious heritage sites and other sociocultural endowments of outstanding significance for the benefit of present and future generations.

## **COMMUNICATE**

The **COMMUNICATE** strategy addresses the issue of awareness and participation -- COMMUNICATE with stakeholders to enhance their level of awareness regarding the importance of the coastal environment and resources, as well as to elicit their active participation in coastal and marine management.

### **Principles**

1. All people have the right to be well-informed on the importance of the coastal and marine area to sustain their livelihoods, as well as to be aware of the impacts of human development activities on the coastal and marine environment.
2. Everyone needs to understand their roles and responsibilities in managing the coastal and marine environment, and thereby contribute to sustainable coastal development.
3. Communication is the key to knowledge enhancement, improved attitudes and behavioral change among the people.

### **Objectives**

1. To improve people's knowledge and awareness of the importance of the coastal and marine environment as well as related management issues and processes;
2. To provide the public with appropriate information regarding the state of the environment; and
3. To facilitate networking among stakeholders to improve their participation in decision-making processes.

## COMMUNICATE

**Objective 1: To improve people's knowledge and awareness of the importance of coastal and marine environment as well as related management issues and processes.**

### Action Programs

1. Improve community knowledge and awareness concerning coastal and marine resources and management by:
  - Undertaking appropriate extension programs with regard to marine and coastal resources for various levels of stakeholders;
  - Conducting training of local communities on sustainable use of marine and coastal resources;
  - Promoting rewards and incentives for "champions and pioneers" in coastal and marine conservation activities; and
  - Developing and disseminating public awareness materials to various stakeholders.
2. Enhance the knowledge base and the use of scientific research in decision-making processes on sustainable development by:
  - Building a multidisciplinary group of local experts from universities, research institutions and competent NGOs to provide scientific inputs into critical decision-making; and
  - Supporting multi-disciplinary scientific research, particularly on significant management issues and problems that threaten the sustainability of the Bali environment, such as Benoa Bay multiple-use conflicts.
3. Improve awareness on relevant rules and regulations on marine pollution prevention and control by:
  - Disseminating the environmental quality criteria, standards and rules/regulations to users and beneficiaries of coastal and marine resources, specifically regarding:
    - (1) water quality;
    - (2) pollution prevention from shipping activities;
    - (3) turtle conservation;
    - (4) coral reef condition, including degradation/damages; and
    - (5) other regulations concerning marine conservation and coastal protection.

# COMMUNICATE

**Objective 2:** To provide the public with appropriate information regarding the state of environment.

## Action Program

1. Establish a suitable information system on coastal and marine environment for use of stakeholders by:
  - Compiling and encoding all relevant data on coastal and marine resources and environment into the integrated information management system (IIMS);
  - Establishing a computer-based linkage with the public to exchange information, encouraging collaboration and developing opportunities for new programs and projects;
  - Building local government capacities in information technology to operate, maintain and upgrade the capacity of IIMS and related computer network facilities; and
- Strengthening and institutionalizing cooperation and collaboration among relevant government agencies, research institutions, universities, NGOs and private sector for effective data/information collection, exchange, sharing, distribution and utilization in decision-making.

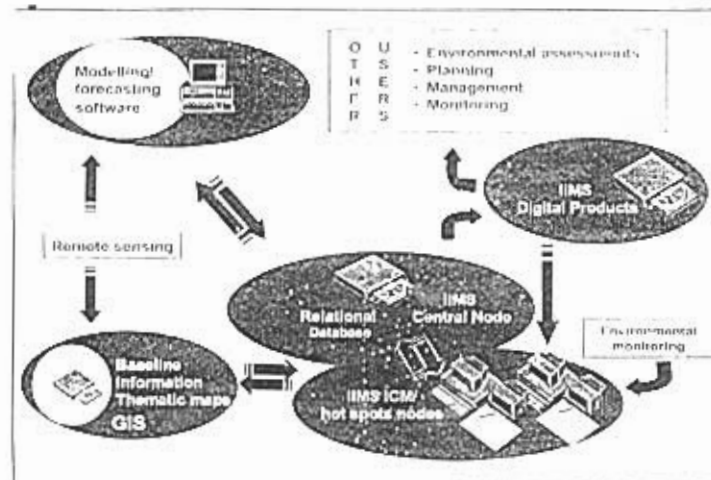


Figure 8. Organizational structure of IIMS.

# COMMUNICATE

**Objective 3: To facilitate networking among stakeholders to improve their participation in decision-making processes.**

## Action Programs

1. Promote and facilitate interaction among stakeholders by:
  - Establishing a communication forum in the village and sub-district levels involving representatives and administrative officers of local communities, NGOs, and the private sector;
  - Establishing communication networks among the communication forums in close linkage with government and multidisciplinary groups; and
  - Involving communication forums and multidisciplinary groups in reviewing and evaluating any plans and proposals for future development.
2. Involve mass media in disseminating information on marine and coastal environment issues to stakeholders by:
  - Building a network between journalists and the local government as a mechanism for information transfer;
  - Conducting regular trainings on environmental management issues for local journalists;
  - Preparing communication materials for mass media based on policy needs and scientific findings on coastal management issues and problems; and
  - Conducting regular press conferences to disseminate information on the status of marine and coastal resources.



Photo 24. Stakeholders meeting in Klungkung.



Photo 25. Communication forum in a village.



## **DEVELOP**

**DEVELOP** strategy deals with improving both socioeconomic conditions and institutional infrastructures -- DEVELOP appropriate institutional and legal regimes to promote effective and integrated management of coastal and marine resources while directing economic activities and programs in suitable areas to improve the economic prosperity of the people.

### **Principles**

1. Integrated coastal and marine area management requires appropriate institutional mechanism.
2. Regulations on the management of coastal and marine resources need to be cognizant of the complex interactions among social, developmental and ecological processes.
3. Coastal and marine resources, as common assets, should be utilized in an environmentally sound manner in order to be sustainable and to meet the needs of future generations.

### **Objectives**

1. To develop appropriate organizational arrangements and strengthen local capacity for effective implementation of integrated coastal management;
2. To enact appropriate laws and regulations to support integrated management of the coastal and marine areas;
3. To promote environment-friendly, responsible and wise utilization of marine and coastal resources; and
4. To promote environmental investments, alternative livelihoods and improved practices/cleaner production technologies.

## DEVELOP

**Objective 1: To develop appropriate organizational arrangements and strengthen local capacity for effective implementation of integrated coastal management.**

### Action Programs

1. Establish appropriate organizational arrangements that facilitate implementation of integrated coastal management by:
  - Undertaking an institutional analysis to clarify the responsibilities and authorities of all institutions and stakeholders involved in coastal management;
  - Developing an interagency, multi-sectoral coordinating mechanism; and
  - Developing a code of conduct among stakeholders for integrated coastal and marine area management.
2. Build the capacity of the local authorities in coastal management with special regard to knowledge on coastal and marine resources and ecosystem processes as well as law enforcement by:
  - Conducting trainings on the management of coastal and marine resources, particularly law enforcement, for relevant staff of local authorities; and
  - Providing local government staff with hands-on experiences and knowledge through the Bali ICM national demonstration project.
3. Empower local communities and traditional organizations involved in coastal and marine management by:
  - Encouraging active participation of local communities in various aspects of coastal and marine area management;
  - Involving the Traditional Village Authority (Banjar) in coastal planning and management; and
  - Organizing local community training programs on environmental monitoring and pollution control.

## DEVELOP

**Objective 2: To enact appropriate laws and regulations to support integrated management of the coastal and marine areas.**

### Action Programs

1. Enact appropriate laws and regulations to support integrated management of coastal and marine areas by:
  - Reviewing and identifying gaps and overlaps of existing rules and regulations related to the management of coastal and marine areas;
  - Enacting and/or amending appropriate laws and regulations to support the implementation of integrated coastal management program; and
  - Integrating formal marine and coastal environmental laws with customary or traditional village laws ("awig-awig").
2. Providing adequate implementation guidelines for the management of coastal and marine areas by:
  - Preparing technical guidelines on integrated coastal management;
  - Preparing standard criteria for environmental quality of coastal and marine ecosystems; and
  - Preparing technical guidelines on waste management for solid waste and waste water/ sewage.

## DEVELOP

**Objective 3: To promote environment-friendly, responsible and sustainable utilization of marine and coastal resources.**

### Action Programs

1. Promote sustainable tourism development in marine and coastal areas by:
  - Developing an action plan on sustainable coastal and marine tourism development in Bali, incorporating issues related to waste management and habitat protection;
  - Mobilizing relevant stakeholders in the tourism sector and associated business sectors to participate in conservation programs for marine and coastal habitats;
  - Enhancing the capabilities of coastal communities and tourism industry operators on sustainable use of marine and coastal resources; and
  - Widely applying a "Tri Hata Karana Award" to the tourism sector as well as related business sectors.
2. Promote responsible fishing practices by:
  - Developing capacities in aquaculture technologies, such as seaweed and fish culturing;
  - Undertaking research/studies on alternative technologies for catching ornamental fish;
  - Improving the installation practices of artificial reefs and other fish aggregating devices to reduce associated adverse impacts on the marine habitat;
  - Educating and training fishers on sustainable fishing practices; and
  - Implementing countermeasures against destructive fishing practices.
3. Promote environment-friendly utilization and development of coastal space by:
  - Developing a long-term, comprehensive land-and sea-use plan for Bali coast;
  - Reviewing the existing land-use plan and integrating it with sea-use plan; and
  - Adopting policies, strategies and technical guidelines for coastal and marine space utilization and development.

**Objective 4: To promote environmental investments, alternative livelihoods and improved practices/cleaner production technologies.**

**Action Programs**

1. Strengthen policy and regulatory environments to promote environmental investment opportunities by:
  - Streamlining the approval process for environmental investment projects;
  - Creating a favorable policy and regulatory environment for developing appropriate environmental infrastructures and services;
  - Developing clear guidelines or criteria for cooperation among private and public sectors, and the donor organizations; and
  - Building the capacity of local governments in packaging, promoting and implementing environmental investment opportunities.
2. Develop alternative livelihood options by:
  - Developing opportunities for alternative jobs and/or supplementary livelihoods;
  - Developing traditional small-scale financing cooperatives for coastal communities; and
  - Protecting the rights and livelihoods of small-scale fishers and fish workers.
3. Create incentive programs for cleaner production technologies and practices by:
  - Developing appropriate technologies to improve practices for agriculture and aquaculture, including sustainable harvesting of swallow nests; and
  - Encouraging ISO certification of local government units, tourism facilities and commercial enterprises.

## **PROTECT**

**PROTECT** strategy ensures that coastal resources and environments are not squandered in pursuit of economic development -- **PROTECT** coastal ecosystems and human population from risks occurring as a consequence of development activities.

### **Principles**

1. Protection of the coastal and marine environment will ensure the sustainable development and economic growth of Bali.
2. Maintenance of coastal ecosystem and marine environment are necessary for sustaining health, culture and welfare of the Balinese people.
3. Every person has the obligation to maintain and protect the environment [Article 6(1), Environmental Management Act No. 23 Year 1997].
4. Countermeasures for environmental protection must be incorporated into the license of development activities (Article 18, Environmental Management Act No. 23 Year 1997).
5. Mitigation measures for coastal and marine environments shall be undertaken with due consideration of the biological diversity of the area.

### **Objectives**

1. To minimize destructive human activities threatening the integrity of the coastal and marine environment;
2. To protect beaches from erosion through combined technological, ecological and regulatory approaches; and
3. To minimize both land- and sea-based pollution loads to the rivers, coastal areas and seas.

# PROTECT

**Objective 1: To minimize destructive human activities threatening the integrity of the coastal and marine environment.**

## Action Programs

1. Empower traditional villages to support activities related to pollution control and environmental protection by:
  - Establishing community-based teams for pollution monitoring and control;
  - Developing a functional mechanism and providing appropriate resources for effective team operation; and
  - Providing the leaders of traditional villages with regular training and appropriate information on environmental protection.
2. Improve the management of protected areas in accordance with the existing land-use spatial planning by:
  - Increasing public awareness on the existing land-use plans;
  - Developing action-oriented conservation programs for protected areas;
  - Improving the management of existing zoning schemes in the mangrove areas of Ngurah Rai National Park, including a review of ownership arrangements in mangrove areas; and
  - Strengthening the enforcement of the existing zoning regulation.
3. Enhance law enforcement to deter destructive activities in coastal and marine areas by:
  - Increasing public awareness on the rules and regulations related to marine pollution and habitat destruction, particularly the punishment measures concerning violations;
  - Undertaking appropriate training to enhance the capability of local law enforcement agencies; and
  - Improving coordination among relevant enforcement agencies and developing an institutional system for integrated law enforcement pertaining to marine pollution prevention and coastal ecosystem protection.



# PROTECT

**Objective 1: To minimize destructive human activities threatening the integrity of the coastal and marine environment.**

## Action Programs (continued)

4. Reduce multiple-use conflicts and uncontrolled development of coastal space by:
  - Reviewing existing coastal development plans with regard to their potential impacts on the health of coastal and marine ecosystems, quality of life of local communities as well as sociocultural integrity;
  - Adopting policies, strategies and guidelines to address multiple use conflicts and uncontrolled development;
  - Developing an integrated land- and sea-use zoning scheme to address multiple-use conflicts with special focus on Benoa Bay; and
  - Creating partnerships among concerned stakeholders and building consensus toward the implementation of an integrated land- and sea-use zoning scheme.
5. Implement planning and management programs to combat adverse impacts of physical alterations and habitat destruction by:
  - Assessing priority risks associated with physical alterations and habitat destruction with special focus on construction projects in Benoa Bay;
  - Identifying socio-economic and cultural impacts associated with physical alterations and habitat destruction of the coastal and marine environment; and
  - Developing an appropriate action program for managing priority risks and reducing associated adverse socio-economic and cultural impacts.

**Objective 2: To protect beaches from erosion through combined technological, ecological and regulatory approaches.**

### Action Programs

1. Improve management capacity for minimizing and preventing beach erosion by:
  - Undertaking multidisciplinary research to understand natural and anthropogenic processes associated with beach erosion;
  - Adopting and implementing appropriate policies and management strategies to minimize and prevent beach erosion; and
  - Applying effective beach protection technology, which is environment-friendly and socio-culturally acceptable to the local community.
2. Increase the beach sediment stability and maintain natural shore processes by:
  - Undertaking beach stabilization programs;
  - Protecting beach vegetation from further destruction and regulating land conversion for commercial purposes; and
  - Applying set-back or shoreland exclusion zones, where appropriate.
3. Protect public facilities and sacred places located in coastal areas by:
  - Applying engineering and regulatory measures for beach protection;
  - Regulating issuance of licenses for building structures along the coastal areas in consultation with traditional organizations;
  - Limiting development of tourism accommodation facilities around the sacred places; and
  - Strengthening the enforcement of local government regulation (*Peraturan daerah*) on protected coastal areas, coastline and sacred beach areas, based on recommendations of *Bhisama*.

## PROTECT

**Objective 3: To minimize both land-and sea-based pollution loads to the rivers, coastal areas and seas.**

### Action Programs

1. Control land-based activities that directly, indirectly, or may potentially pollute the marine environment by:
  - Building integrated wastewater treatment facilities, particularly in dense settlements and industrial areas;
  - Requiring development projects to implement preventive and mitigation measure, including the provision of waste water treatment facilities in compliance with the recommendations of EIA studies;
  - Imposing levies on waste water discharges in order to encourage waste water recycling practices;
  - Controlling the use of fertilizers and pesticides for agriculture;
  - Implementing an integrated solid waste management system; and
  - Building industrial waste water treatment facilities for small-scale industries.
2. Control sea-based activities with potential to pollute and damage the marine environment by:
  - Prohibiting anchoring around the coral reef ecosystems;
  - Installing mooring buoys for anchoring and providing clear diving sign posts;
  - Avoiding discharge of ballast water in Benoa and Padangbai harbors;
  - Implementing waste management procedures for solid waste and oily waste from ships; and
  - Integrating coastal navigational routes into land- and sea-use zoning schemes; and
  - Implementing the requirements of MARPOL 73/78.
3. Monitor and assess pollution loads and the environmental quality of marine and coastal ecosystems by:
  - Undertaking regular monitoring of marine water quality;
  - Undertaking annual monitoring program for assessing the health of coral reef ecosystem and other marine habitats; and
  - Requiring hotels, restaurants and small-scale industries to monitor and report on waste water discharges.



Photo 26. Rubbish dumpsite in Suwung, Denpasar.

## **PRESERVE**

**PRESERVE** strategy is designed to maintain the integrity of key ecological and human values -- PRESERVE natural resource systems, including coastal and marine habitats and groundwater, religious heritage sites and other sociocultural endowments of outstanding significance for the benefit of present and future generations.

### **Principles**

1. Environmental management programs shall emphasize the conservation of the unique and diverse cultural and natural heritage of Bali.
2. Pristine habitats and areas of ecological, social or cultural significance are irreplaceable assets.
3. The rights of indigenous people should be respected and observed at all times.
4. The use of integrated marine and coastal area management is the most suitable framework for addressing human impacts on marine and coastal biological diversity and for promoting conservation and sustainable use of this biodiversity (Jakarta Mandate of The Convention on Biological Diversity, 1995).

### **Objectives**

1. To intervene in processes that threaten coastal and marine biological diversity;
2. To safeguard groundwater resources and prevent saltwater intrusion; and
3. To preserve areas of sociocultural and religious significance.

## PRESERVE

**Objective 1: To intervene in processes that threaten coastal and marine biological diversity.**

### Action Programs

1. Integrate the conservation and sustainable use of biological diversity into relevant sectoral plans, programs and policies by:
  - Identifying components of biological diversity important for conservation and sustainable use;
  - Developing policies, management strategies and technical guidelines with respect to the utilization of essential coastal habitats, such as coral reefs, mangroves and seagrass beds; and
  - Developing appropriate guidelines for recreational activities, such as diving in coral reef areas.
2. Respond to the components of biological diversity at risk and requiring urgent conservation measures by:
  - Conducting monitoring and risk assessment analysis of important coastal habitats, such as mangroves, coral reefs and seagrass beds;
  - Exploring the possibilities of rehabilitating coastal areas to enhance turtle nesting in Nusa Dua and Serangan;
  - Controlling the utilization of land surrounding mangrove ecosystems; and
  - Developing partnerships among local governments, industrial sectors such as fishery, aquaculture, tourism, trade, and transportation, the private sector, environmental NGOs and the scientific community to effectively protect species and habitats at risk.
3. Promote the protection of ecosystems and natural habitats and the maintenance of viable populations of species in the natural setting by:
  - Generating and disseminating relevant information on habitat degradation and restoration;
  - Improving coordination among various stakeholders that utilize land for various purposes around mangrove areas in the National Forest of Ngurah Rai; and
  - Establishing a management system of protected areas and undertaking special measures to conserve biological diversity.

## PRESERVE

**Objective 2 : To safeguard groundwater resources and prevent salt water intrusion.**

### Action Programs

1. Control the exploitation of ground water for industrial and commercial purposes by:
  - Strengthening the control of licenses for ground water utilization; and
  - Limiting the licenses issued for ground water utilization around the coastal areas for industrial or commercial purposes, including hotels and restaurants.
2. Develop and implement water conservation programs by:
  - Promoting the use of low water-use devices and water conservation practices at residential, commercial and industrial areas;
  - Mobilizing relevant stakeholders to participate in water recycling and reuse programs; and
  - Identifying alternative water sources and developing long-term policies and strategies for water conservation and groundwater protection.
3. Enhance recharge areas to improve water table by:
  - Controlling the issuance of building licenses in recharge areas in order to implement basic building coefficient principles consistently.

**Objective 3: To preserve areas of sociocultural and religious significance.**

**Action Programs**

1. Develop conservation programs for heritage sites, structures and traditional activities of sociocultural and religious significance by :
  - Conducting a comprehensive survey and mapping of heritage areas, structures and traditional activities of sociocultural and religious significance;
  - Incorporating survey results into existing and future land- and sea-use zoning schemes and delineating appropriate buffer zones around the significant areas;
  - Adopting and implementing policies and strategies for preserving areas, structures and traditional activities of sociocultural and religious significance; and
  - Preparing appropriate legislation and regulations.
2. Enhance local capacity to manage and conserve heritage areas, structures and traditional activities of sociocultural and religious significance by:
  - Developing implementation guidelines employing the technical recommendations provided by international instruments;
  - Providing training and education to local government officials, leaders of traditional villages, civil society groups, employees in the tourism sector and other concerned stakeholders; and
  - Mobilizing the participation of traditional villages, civil society groups, religious leaders, media, and scientific communities in implementing conservation programs.



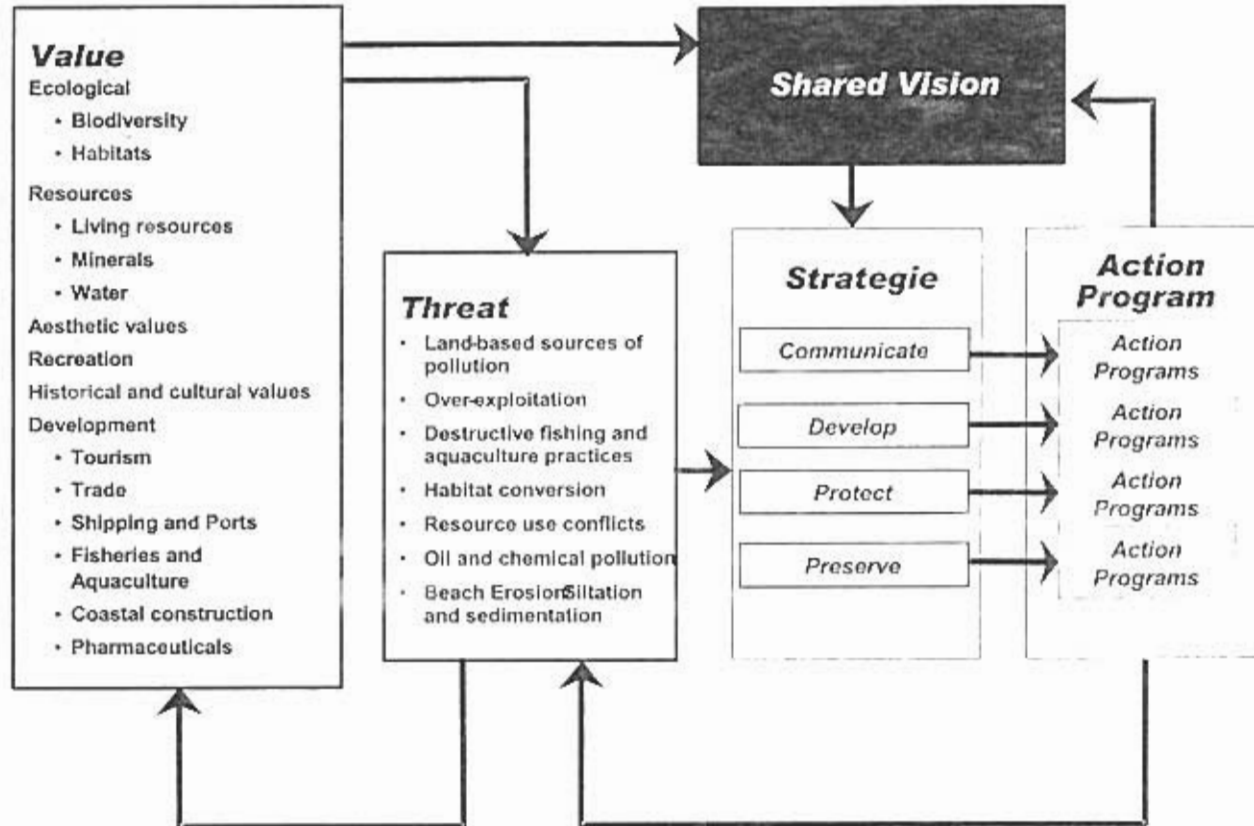
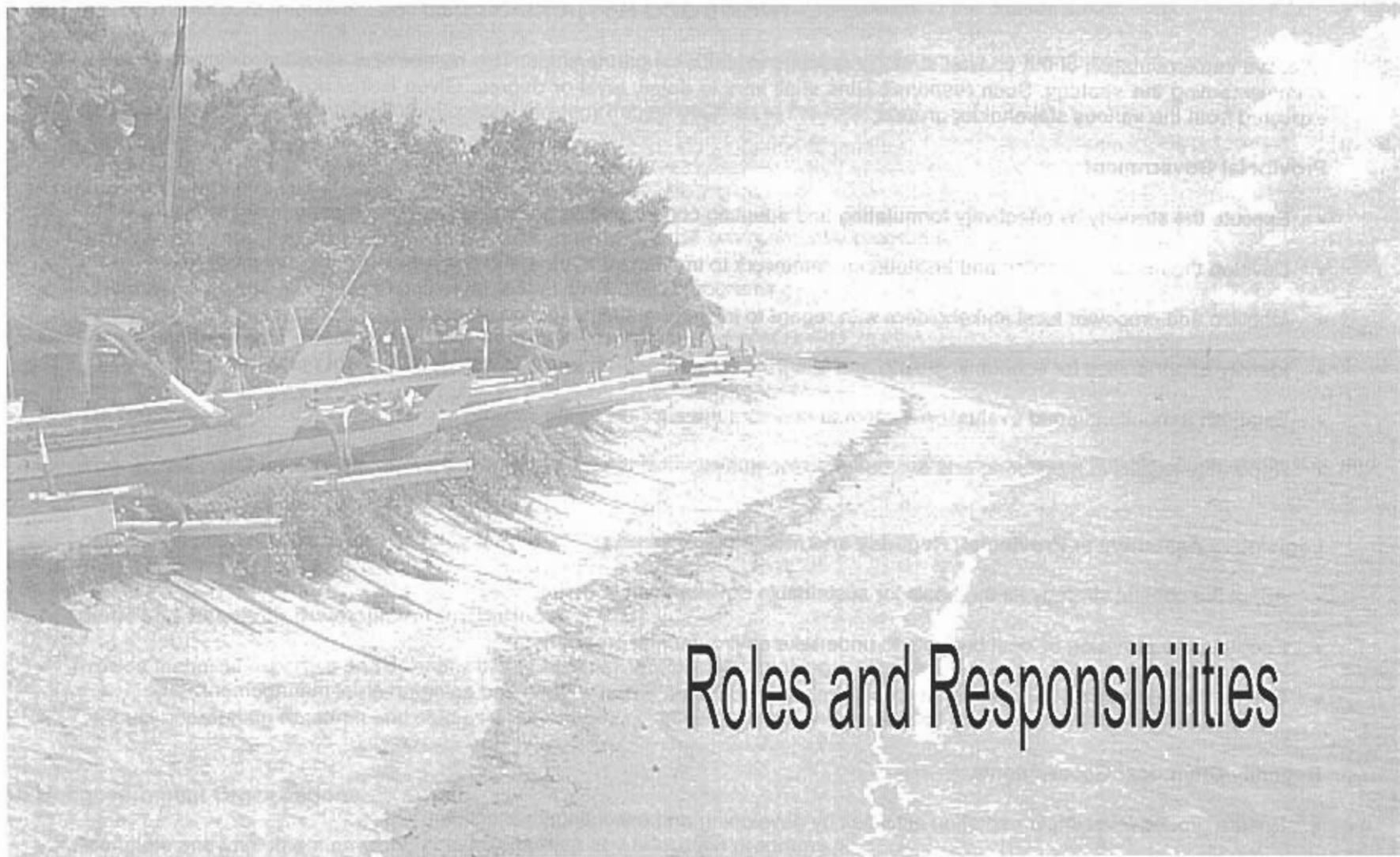


Figure 9. A strategic approach to achieving a shared vision for the southeastern coast of Bali.



## Roles and Responsibilities

## **Roles and Responsibilities**

Effective implementation of the coastal strategy requires institutional partnerships. This means that all stakeholders have roles to fulfill in implementing the strategy. Such responsibilities shall vary in detail, level or degree. Given below are the roles and responsibilities expected from the various stakeholder groups:

### **Provincial Government**

- Execute the strategy by effectively formulating and adopting corresponding coastal and marine management measures.
- Develop the necessary policy and institutional framework to implement marine and coastal environmental programs.
- Mobilize and empower local stakeholders with regard to implementation of action programs.
- Identify opportunities for economic growth and integrate environmental concerns with development programs.
- Establish a monitoring and evaluation system to measure the success of the strategy.
- Report the results of monitoring and evaluation to the public.

### **Legislative Assembly at Provincial, Regency and Municipality Levels**

- Adopt the coastal strategy as the basis for sustainable development in Bali.
- Facilitate the provision of local budgets to undertake environmental programs.
- Ensure the institutional linkages among economic development, social welfare and environmental management.

### **Regency/City/Local Governments**

- Ensure ground-level implementation activities by developing and executing local action plans.
- Mobilize local stakeholders to actively participate in the implementation of environmental management programs.

- Implement the ICM framework and process to effectively manage multiple-use conflicts in the coastal areas.
- Identify opportunities for environmental investments, particularly those requiring public-private partnerships.
- Conduct monitoring and evaluation of coastal strategy implementation at the local level.

#### **Traditional Village Groups**

- Organize and mobilize local communities in undertaking coastal environmental programs.
- Strengthen linkages among environmental, social and cultural programs.
- Ensure that the rights of indigenous communities are protected and preserved.

#### **Private Sector**

- Work in partnership with the provincial and municipal governments, as well as other relevant institutions, such as NGOs and traditional village groups.
- Identify and develop investment opportunities in environmental management programs.

#### **Academe and Research Development Institutions**

- Provide technical expertise and scientific inputs to policy and decision-making processes.
- Conduct appropriate research and studies to enhance local understanding and capacities in environmental management.

#### **Nongovernment Organizations**

- Formulate and implement environmental information and education programs.
- Organize and mobilize local communities in environmental programs.

- Promote the rights of indigenous people and marginalized groups.
- Assist in raising funds in support of environmental action programs.

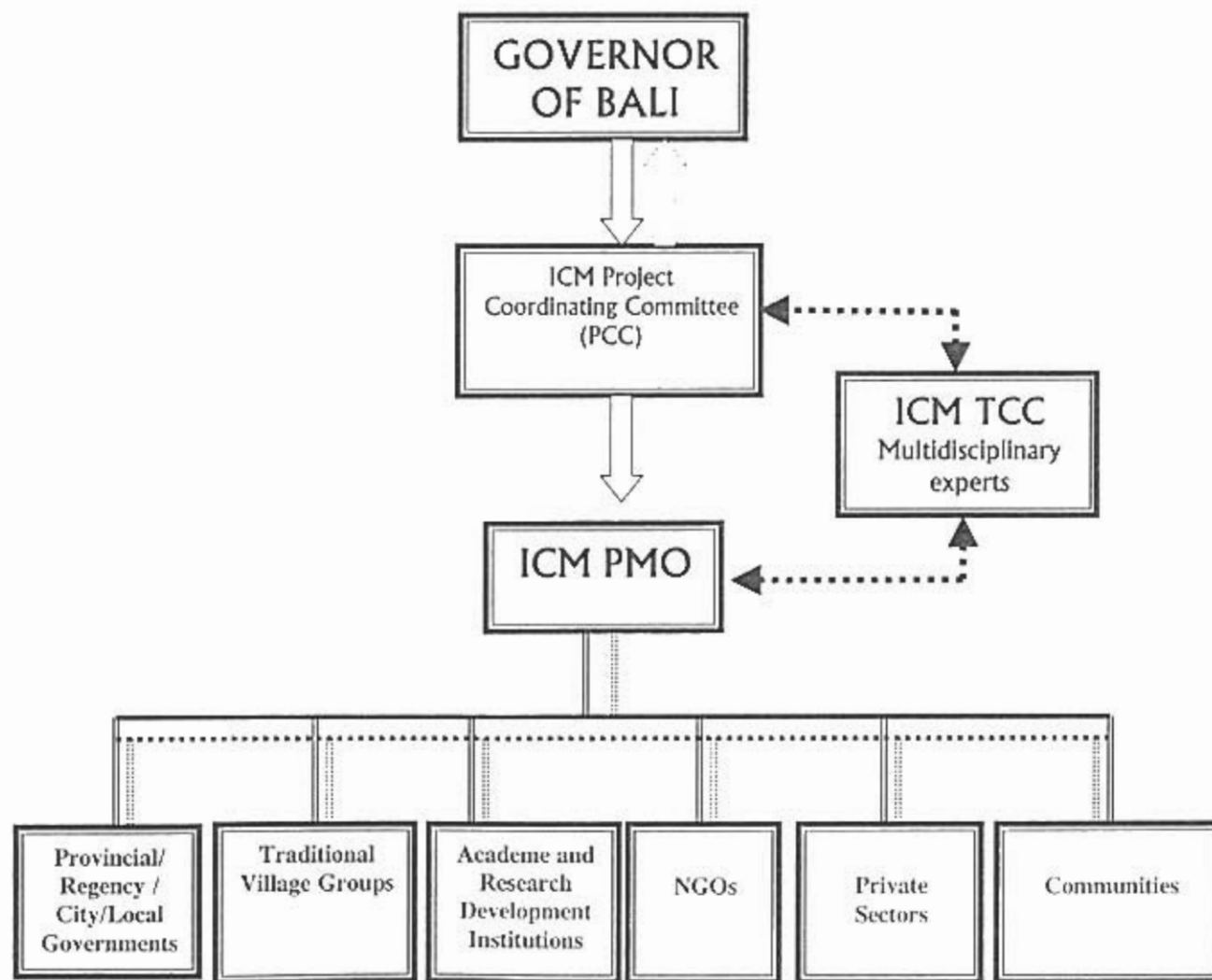
### **Communities**

- Support and actively participate in planning, development and implementation of action programs.
- Serve as volunteer communicators, educators and advocates of the environmental programs to other stakeholders.

***Furthermore, Bali stakeholders need support from the Central Government, related Ministries, and various sectors, international organizations, and donors for the implementation of the Strategy with special regard to:***

- policy guidance and coordination;
- institutional strengthening;
- technical assistance and support;
- investment in infrastructures and environmental facilities;
- financial support;
- capacity building;
- transfer of new technology; and
- international and regional cooperation.

Figure 10. **The institutional mechanism for coastal strategy implementation**



DILARANG MELAKUKAN PENANGKAPAN  
DAN PEMBUDIDAYAAN IKAN DENGAN MENGGUNA  
KAN BAHAN DAN/ATAU ALAT YANG DAPAT  
MEMBAHAYAKAN KELESTARIAN SUMBER  
DAYA IKAN DAN LINGKUNGANNYA

BARANG SIAPA YANG MELANGGAR  
KETENTUAN INI, DIPIDANA PENJARA SELAMA 10 TH.  
ATAU DENDA SEBANYAK-BANYAKNYA Rp. 100.000.000.

UU NO. 9 T

Policy and Regulations

## **Policy and Regulations**

### **International Instruments/Conventions Ratified by the National Government of Indonesia**

1. United Nations Convention on the Law of the Sea, 1982 (UNCLOS, 1982).
2. International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), Annex I/II.
3. International Convention on Civil Liability for Oil Pollution Damage (CLC) Protocol 1992.
4. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 1989 (Basel Convention).
5. United Nations Framework Convention on Climate Change, 1992 (UNFCCC).
6. Convention on Biological Diversity, 1992 (CBD).
7. Ramsar Convention on Wetlands, 1971 (RAMSAR Convention).
8. Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973 (CITES).
9. Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972 (World Heritage Convention).

### **National Level**

1. Law Number 1 Year 1973 concerning Indonesian continental territory.
2. Law Number 5 Year 1983 concerning Indonesian exclusive economic zone.
3. Law Number 5 Year 1984 concerning industry.
4. Law Number 9 Year 1985 concerning fishery.
5. Law Number 5 Year 1990 concerning conservation of natural resources and ecosystem.



6. Law Number 12 Year 1992 concerning agricultural system.
7. Law Number 21 Year 1992 concerning sea transportation.
8. Law Number 21 Year 1992 concerning spatial planning.
9. Law Number 5 Year 1992 concerning cultural preservation.
10. Law Number 6 Year 1996 concerning Indonesian marine territory (replacing Law Number 4 Year 1960).
11. Law Number 23 Year 1997 concerning environmental management.
12. Law Number 22 Year 1999 concerning local government.
13. Government Regulation Number 17 Year 1974 concerning supervision of off-shore exploration and exploitation.
14. Government Regulation Number 15 Year 1984 concerning natural resources management in Indonesian exclusive economic zone.
15. Government Regulation Number 27 Year 1999 concerning environmental impact assessment.
16. Government Regulation Number 19 Year 1999 concerning marine pollution and/or degradation control.
17. Presidential Decree Number 32 Year 1990 concerning protected area management.
18. Presidential Decree Number 20 Year 1990 concerning water pollution control.
19. Government Regulation Number 18 Year 1999 concerning hazardous waste management.
20. Government Regulation Number 25 Year 2000 concerning central and provincial government authority as autonomous regions.
21. Decree of the Minister of Population and Environment Number: KEP-02/MENKLH/1/1988 concerning environmental quality standards.
22. Decree of the Minister of Trade Number 94/Kp/V/95 concerning prohibition for the export of Napoleon Wrasse Fish (*Cheilinus undulatus*).

23. Decree of the Minister of Agriculture Number 327/Kpts/Um/5/78 concerning protection of Leather Back Turtle (*Dermochelys coriacea*); Number 716/Kpts/Um/10/1980 concerning olive ridley loggerhead turtle (*Lepidochelys olivacea*) and Loggerhead Turtle (*Caretta caretta*).
24. Decree of the Minister of Forestry Number 882/Kpts-II/92 concerning protection of Hawksbill Turtle (*Eretmochelys imbricata*) and Flat back Turtle (*Natator depressa*).
25. Decree of the State Minister of Environment Number: KEP-45/MENLH/11/1996 concerning beach conservation program.
26. Decree of the State Minister of Environment Number: KEP-35A/MENLH/7/1995 concerning industrial performance rating/pollution control activity of clean river program.
27. Decree of the State Minister of Environment Number: 04 Year 2001 concerning criteria standard of coral reef damage.
28. Head of BAPEDAL Decree Number: 47 Year 2001 concerning guidelines on coral reef condition measurement.

#### **Local Level**

1. Bali Local Government Regulation Number 2 Year 1973 concerning prohibition of exploiting sand, gravel, rocks, sandstone, limestone, and so forth.
2. Bali Local Government Regulation Number 3 Year 1985 concerning fish protection.
3. Bali Local Government Regulation Number 17 Year 1991 concerning fishing business license, and Governor's Decree Number 649 Year 1995 concerning the implementation of Bali Local Government Regulations Number 17 Year 1991.
4. Bali Local Government Regulation Number 4 Year 1996 concerning spatial planning, and Bali Local Government Regulation Number 4 Year 1999 concerning the First Addendum of Bali Local Government Regulation Number 4 Year 1996.
5. Bali Local Government Regulation Number 16 Year 1988 concerning pollution supervision and prevention.
6. Decree of Bali Governor Number 359 Year 1993 concerning establishment of marine tourism area.
7. Decree of Bali Governor Number 22 Year 1990 concerning control and management of hunting ground, protection of wildlife and turtle.

## Appendix 1 :

## VALUE/POTENTIAL OF SOUTHEASTERN COAST OF BALI

## 1. Natural Potential/Values

Natural Potential/Values	Denpasar Municipality	Badung Regency	Gianyar Regency	Klungkung Regency	Karangasem Regency
1. Beach	Length of coastline is 8 km. White sandy beaches are in Sanur Beach and Serangan Island while the black gray beach is in Padanggalak.	White sandy beaches stretching from Tanjung Bonoa to Geger Beach, Bonoa District administered	Length of coastline is 15 km with black gray sandy beaches.	Total length of coastline is 62 km characterized by black gray sand in the mainland, while the white sand is found in the northern part of Lembongan Island and Ceningan Island as well as in northern and northwestern part of Nusa Penida. The rest of beaches characterized by cliffs.	Length of coastline is 70 km characterized by white sand beaches and cliffs.
2. Mangrove	Area: 734.5 ha	Area: 627 ha	-	Area: 202 ha	-
3. Coral Reefs	Stretching from Sanur beach to Serangan island. Coral reefs in Sanur are regarded as barrier reef and become natural protection of wave.	Located along Tanjung Bonoa, Bonoa and Nusa Dua	-	Found in the area of Nusa Penida, Lembongan and Ceningan, with a total areas of 541.4 ha.	Found in Padangbai, Labuhan Amuk, Candidasa, Gili Tepekong, Bunutan, Amed and Tulamben
4. Lagoon Ecosystem	Lagoon ecosystem in Sanur is characterized by shallow waters between barrier reef and land area.	-	-	-	-
5. Beach landscape	Beautiful Sanur beach is a famous tourist resort in Bali.	Coastal landscape with beautiful views in Tanjung Bonoa and Nusa Dua	-	-	Coastal landscape with beautiful views in areas of Candidasa, Ujung and Tulamben
6. Big waves	In Sanur, Serangan and Padanggalak beaches	Geger Beach	Biaung Beach	Lembongan Beach	-

Natural Potential/Values	Denpasar Municipality	Badung Regency	Gianyar Regency	Klungkung Regency	Kabupaten Karangasem
7. Sea grass	In Sanur, Mertasari and Serangan beaches	In Tanjung Bena and Geger beaches	-	In Lembongan Island and Dusun Semaya Nusa Penida	-
8. Small islands	Serangan island	-	-	Nusa Penida, Lembongan and Ceningan Island	Gilitepekong
9. Sea weed	Important economical species <i>Gelidium</i> , <i>Hypnea</i> , <i>Caulerpa</i> , and <i>Gracilaria</i> .	Important economical species. <i>Gelidium</i> , <i>Hypnea</i> , <i>Caulerpa</i> , dan <i>Gracilaria</i> .	-	Important economical species: <i>Gelidium</i> , <i>Hypnea</i> , <i>Caulerpa</i> , and <i>Gracilaria</i> .	-
10. Endangered Species	Kima ( <i>Tridacna</i> )	Kima ( <i>Tridacna</i> )	-	Hawksbill turtle ( <i>Eretmochelys imbricata</i> ), Green turtle ( <i>Chelonia mydas</i> ), kima ( <i>Tridacna sp.</i> ), Napoleon wrasse ( <i>Cheilinus undulatus</i> ), Sunfish ( <i>Mola mola</i> ), Manta ray, etc.	Napoleon wrasse ( <i>Cheilinus undulatus</i> ), kima ( <i>Tridacna sp.</i> ), Green turtle ( <i>Chelonia mydas</i> )
11. Swallow nest	-	-	-	Ceningan and Nusa Penida island	

## 2. Cultural Value

Cultural Value	Denpasar Municipality	Badung Regency	Gianyar Regency	Klungkung Regency	Karangasem Regency
1. Beaches as sacred places ( <i>melasti</i> ceremonies)	Padanggalak, Matahari Terbit, Mertasari, Segara, Semawang, Bena, Pumama and Suwung	Tanjung Bena and Pngiat	Biaung, Gumicik, Rangkan, Pumama, Masceti, Lebit, and Siyul	Negari, Lelang, Watu Klotok, Sidayu, Jumpai and Kusamba	Candidasa, Buitan, Yeh Malet and Padangbai
2. Archaeological and Cultural Sites	Pura ( <i>temple</i> ) Jumeneng, Pura Segara, Pura Blanjong, Pura Sakenan, Pura Cemara and Pura Susunan Wadon and Kuna Assyu' Hada ancient mosque	Spread over several locations	Spread over several locations	Spread over several locations	Ujung Garden Palace

Cultural Value	Denpasar Municipality	Badung Regency	Gianyar Regency	Klungkung Regency	Karangasem Regency
3. Temple sites	Pura (temple) Sakenan, Pura Blanjong, Pura Susunan Wadon, Pura Segara, etc.	Pura Segara, Pura Geger, etc.	Pura Swara, Pura Taman Sari and Pura Hyang Naga, Pura Segara, Pura Er Jeruk, Pura Masceti, Pura Slukat, Pura Segara Wilis, Pura Swaren Kidul and Pura Anyar, Pura Lembeng, Pura Cemeng, Pura Segara Suwapati, Pura Taman Sari, Pura Berti, Pura Tanah Putih, Pura Dalem, Pura Rajapati, Pura Ratu Seruni, Pura Lembeng, Pura Tira, and Pura Bualan	Pura Goa Lawah, Pura Watu Klotok, Pura Dalem Jumpa, Pura Tirta Lembang, Pura Sela Pogal, Pura Segara Kusamba, Pura Ped, Pura Batu Medau etc.	Pura Dangkahyangan (Pura Silayukti and Pura Manik Kembar/Pura Batu Belah), pura swagina and other temples.

### 3. Recreation and Tourism Values

Recreation and Tourism Values	Denpasar Municipality	Badung Regency	Gianyar Regency	Klungkung Regency	Karangasem Regency
1. Tourism Objects	Le Mayeur Museum, Serangan, Ancient inscription of Blanjong area and Art Centre	-	Lebih Beach	Jungutbatu and Lembongan	Ujung Garden Palace, Tompanan Village and Padangbai Harbor
2. Tourism Accommodation	25 tourism cottages with 112 rooms, 43 non-star hotels with 953 rooms and 22 star hotels with 3,019 rooms in Sanur area	International tourism accommodations with star and non-star hotel facilities located in Nusa Dua and Tanjung Benoa	Saha Beach	Located in Lembongan and Jungutbatu villages	Star Hotel in Buitan Beach, Non-star hotel and cottages Candidasa, Amed, Bunutan and Tulamben
3. Recreation Beach	Sanur, Serangan and Mertasari	Tanjung Benoa, Benoa, Nusa Dua and Geger Beach	Biaung, Purnama, Lebih and Siyut	Ped, Jungutbatu and Lembongan	Candidasa, Jumeluk and Padangbai
4. Water sport	Located in Sanur with various activities such as jet ski, parasailing, banana boating, wind surfing, canoeing, and so forth	Wind surfing, jet ski, banana boating, canoeing, parasailing, etc that are found along Tanjung Benoa to Nusa Dua.	-	Located in beaches of Lembongan, Jungutbatu, Ped, Toyapaketi and its surrounding. Activities include parasailing, banana boating, ocean rafting, submarine explorer	-
5. Surfing	Sanur and Serangan beaches	Geger Beach	Biaung Beach	Jungutbatu and Lembongan	-

Recreation and Tourism Values	Denpasar Municipality	Badung Regency	Gianyar Regency	Klungkung Regency	Karangasem Regency
6. Diving and Snorkeling	Sanur Beach	Tanjung Benoa and Nusa Dua Beach	-	Toyapakeh, SD Point, Pod, Sampalan, Malibu Point, Turtle Point, Batu Aba, Batu Lumbung, Manla Point, Crystal Bay and Garnet Bay, Lembongan Point, Blue Corner, Sakenan Point and Pamaroan Point, Ceningan Point	Pasir Putih, Tanjung Jepun, Gilitopekong, Bunutan, Jumeluk, and Tulambon.
7. Recreational Fishing	Sanur Waters	Nusa Dua Beach	Gumick, Rangkan, Purnama, and Lebih Beach	Nusa Penida and Lembongan	-
8. Marina	In Benoa Port	-	-	-	-

#### 4. Settlement

Settlement	Kota Denpasar	Badung Regency	Gianyar Regency	Klungkung Regency	Karangasem Regency
Settlement Density	Densely populated	Densely populated	Low population density	Low population density	Low population density

## 5. Utilization/Development

Utilization/Development	Denpasar Municipality	Badung Regency	Gianyar Regency	Klungkung Regency	Karangasem Regency
1. Agriculture	Wetland agriculture (rice field) and horticulture agriculture	Dry land agriculture	Wetland agriculture (rice field) and horticulture agriculture	Wetland agriculture (rice field), horticulture and dry land agriculture	Wetland and fertile agricultural area
2. Industries	Small scale industries and handicrafts	Small scale industries and handicrafts	Small scale industries and handicrafts	Small scale industries, Salt panning	Salt panning
3. Marine Fisheries	Sabur and Serangan; In 1999, there are 226 fishing vessels using traditional boats and 599 motor boats. The development of commercial fishing in Denpasar is supported by the existence of Bena harbor as motor boats base.	Tanjung Bena and Bena. In 1999, there were 1229 vessels in Badung using traditional fishing boats, 89 powered boats and 529 ships. There are two anchoring locations or fish markets in Badung Regency, one of them is located in Tanjung Bena.	Artisan fisheries with fishing vessels using traditional boats (without motor) and motor boats. Fishing fleets are located in Lebih, Rangkan and Saba Beach.	Artisan fisheries; The total number of artisan fishery vessels in Klungkung in 1999 was 1,752 units consisting of 1,137 traditional boats and 615 motor boats. The fishing ground is area around Kusamba, Lembongan, Ceningan, Toyapakeh, Mentigi, Sampalan, Batununggul, and Suana. While the main fish markets are Batununggul and Kusamba.	Artisan fisheries. The total number of artisan fishery vessels in 1999 was 3,509 units (617 traditional boats and 2,892 unit motor boats). These consist of 3,530 fishermen household in 1999.
4. Aquaculture	Shrimps farming and milkfish in Suwung as well as seaweeds culture in Serangan Island	Seaweed Cultivation in Geger and Sawangan beaches; The area of this cultivation is 50.7 ha.	Shrimps farming (udang windu and udang galah)	Seaweed cultivation in: Desa (village) Lembongan (40.6 ha), Desa Jungulbatu (42.1 ha), Desa Toyapakeh (2.2 ha), Desa Ped (24.9 ha), Desa Kutampi (1.9 ha), Desa Batununggul (23.7 ha), and Desa Suana (26.7 ha).	-
5. Mining	-	-	-	The total area of sand and rock mining in Klungkung Regency is 12,000 ha with a total deposit of 5,625 thousand m <sup>3</sup> .	The total area of sand mining (Golongan C) was about 60,000 ha with a total deposit of 16,109.91 thousand m <sup>3</sup> .
6. Plantation	-	-	-	Coconut	Cashew fruits

Utilisation/Development	Denpasar Municipality	Badung Regency	Gianyar Regency	Klungkung Regency	Karangasem Regency
7. Ports	Benoa Harbor located in Denpasar is open to international as well as domestic trading which is also currently developed for passengers, cargo handling, tourism and fishing purposes	-	-	Local ports (community based) with the purpose of connecting small islands in Nusa Penida sub-district, and Klungkung mainland and other parts of Bali; The main means of transportation is traditional boats, motor boats found in Kusamba, Buyuk, Toyapakeh, Lembongan, Jungutbatu and Ceningan beach.	Padangbai Harbor for ferry transfers and special harbor of oil terminal in Labuhan Amuk



## Photo Credits

### Original Photographs :

BAPEDALDA Bali Province

PEMSEA Regional Programme Office

PMO National ICM Demonstration Project in Bali, Indonesia.

WWF Wallacea Bioregion

### Publication Photographs:

Impact Postcards Published by Periplus Editions BL-145 Photo @Tony Martobano

Impact Postcards Published by Periplus Editions EC-641 Photo @Rio Helmi

## References

- Badan Pusat Statistik Propinsi Bali, 2000. Evaluasi Hasil Sensus Penduduk 2000.
- Badan Pusat Statistik Propinsi Bali, 2000. Produk Domestik Regional Bruto Propinsi Bali 1994-1999, Jilid I Sektor.
- Bali Beach Conservation Project. 1998. Field Survey Report, Vol. IV. Marine Ecological Survey.
- Bali Beach Conservation Project. 1998. Environmental Assessment Report, Internal Working Draft.
- Badan Perencanaan Pembangunan Daerah Tingkat I Bali, 1999. Data Bali Membangun 1999.
- Badan Perencanaan Pembangunan Daerah Tingkat I Bali, 1998/1999. Studi Analisis Mengenai Dampak Lingkungan Kawasan Pariwisata Nusa Penida, Laporan Utama.
- Dinas Pariwisata Propinsi Bali. 2000. Bali Tourism Statistics (Statistik Pariwisata Bali '2000).
- Dinas Perikanan Propinsi Daerah Tingkat I Bali, 1990. Laporan Tahunan Perikanan Bali Tahun 1990.
- Dinas Perikanan Propinsi Daerah Tingkat I Bali, 1991. Buku Tahunan Statistik Perikanan Propinsi Daerah Tingkat I Bali Tahun 1991.
- Dinas Perikanan Propinsi Daerah Tingkat I Bali, 1995. Laporan Tahunan Perikanan Bali Tahun 1995.
- Dinas Perikanan Propinsi Daerah Tingkat I Bali, 1995. Buku Tahunan Statistik Perikanan Propinsi Daerah Tingkat I Bali Tahun 1995.
- Dinas Perikanan Propinsi Daerah Tingkat I Bali, 1998. Laporan Tahunan Perikanan Bali Tahun 1998.
- Dinas Perikanan Propinsi Daerah Tingkat I Bali, 1998. Buku Tahunan Statistik Perikanan Propinsi Daerah Tingkat I Bali Tahun 1998.
- Dinas Perikanan Propinsi Daerah Tingkat I Bali, 1999. Laporan Tahunan Perikanan Bali Tahun 1999.
- Dinas Perikanan Propinsi Daerah Tingkat I Bali, 1999. Buku Tahunan Statistik Perikanan Propinsi Daerah Tingkat I Bali Tahun 1999.

- Higa, 1997, *Coral Reefs: Mines of Precious Substances*. Trop. Coasts 4 (1) GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in East Asian Seas.
- Koba, M. 1993. The present conditions of coral on the reef flats in Sanur, Nusa Dua and Kuta of Bali Island, Indonesia. In M. Inoue (ed.), *Ecotechnology Reports*, Industrial Institute of Kansai University.
- ICM Bali, 2001. *Environmental Profile of Southeastern Coast of Bali*.
- WWF Wallacea Bio Region, 2000. *Reef Check 2000*.