

DESCRIPTION OF PROJECT AREA

1. This document is a summary of the seven districts and three national marine protected areas (MPAs) to be the focus of Asian Development Bank's (ADB) Coral Reef Rehabilitation and Management Program—Coral Triangle Initiative Project (COREMAP—CTI). The project sites are described in Table 1. The detailed indicators and status of project area, including social, economic, policy, and ecological profile, are in the Project Administration Manual.¹

2. Indonesia's coral reefs, mangrove swamps, sea grass beds, lagoons, and estuaries in the coastal zone are highly productive ecosystems that serve as an important base for the country's economic growth and on which the majority of the coastal inhabitants of the country rely for food, income generation, construction materials, and coastal protection. Indonesia's coastal areas are also of critical significance for science, education, pharmaceuticals, and global conservation and heritage. As Indonesia lies within the Coral Triangle, it is one of the six countries that host the greatest marine biodiversity in the world. Indonesia is home to the world's most extensive and biologically diverse mangrove forests (43 species); sea grass beds (13 species); and coral reefs with more than 70 genera and 500 species (60% of the world's coral species) that cover 42,000 km² accounting for 18% of the world's coral reef area. In addition, there is an equally significant diversity of other key animals such as molluscs (2,500 species), crustaceans (2,000 species), marine mammals (30 species); and turtles (6 of the world's seven species).²

I. Selection of Provinces and Districts and National Marine Protected Area Sites

3. Riau Islands, North Sumatra and West Sumatra provinces were selected for COREMAP II based on previous feasibility studies under Phase I of COREMAP and were reconfirmed during the project preparatory technical assistance (PPTA) for COREMAP II and COREMAP CTI. The selection of these provinces was based on (i) their importance for reef protection and management, and (ii) the economic importance of these reefs to the fishing communities in a total of 26 maritime districts. The three provinces have a total of approximately (320,000 ha) of inshore reefs: (i) 217,000 ha (68%) in Kepulauan Riau , (ii) 36,000 ha (11%) in West Sumatra, and (iii) 65,000 ha (20%) in North Sumatra.

Table 1: Sites of ADB COREMAP—CTI Feasibility Study and Proposed Sites

Province	District/Municipality	Status of Site
North Sumatra	North Nias District	COREMAP II District MPA site
	Central Tapanuli District	COREMAP II site District MPA site
West Sumatra	Mentawai Islands District	COREMAP II District MPA site
	Pariaman District	Pulau Pieh-national MPA site
Riau Islands	Bintan District	COREMAP II District MPA site
	Lingga District	COREMAP II District MPA site
	Natuna District	COREMAP II District MPA site
	Batam Municipality	COREMAP II District MPA site
	Anambas District	Anambas-National MPA site
West Lesser Islands (NTB)	North Lombok District	Gili Matra-National MPA site

COREMAP—CTI = Coral Reef Rehabilitation and Management Program–Coral Triangle Initiative, MPA = marine protected area.

Sources: COREMAP–CTI Ministry of Marine Affairs and Fisheries Design Document. 2012.)

¹ Project Administration Manual (accessible from the list of linked documents in Appendix 2 of the RRP).

² Indonesia State of the Coral Triangle Report (July 2012, CTI NCC) and http://pdf.wri.org/reefs_at_risk_revisited_coral_triangle.pdf

4. Table 1 lists the final districts and MPAs to be covered under COREMAP—CTI by the ADB. Seven of the districts are COREMAP II return sites, chosen originally for COREMAP II for their extent of coral reef ecosystems and the higher quality of the reefs in these districts overall. South Nias was dropped from the COREMAP—CTI program as it had recently had an institutional change, splitting from one district to three that will create too many delays in the policy process to allow it to continue as a demonstration site/district. Its ecosystem is still of relatively high quality, and hopefully can soon replicate the other advances in the COREMAP—CTI districts. Each of the seven districts also has a district-level MPA that has been initiated and is already in process to continue its development. Lingga is in the process of finalizing the MPA initiation decree, but the local government has already begun the management planning process and steps to create a management unit pending the resolution of a minor boundary clarification for the final decree to initiate its development.

5. There are two national level MPAs in early development in Sumatra, one in West Sumatra (Pulau Pieh, Pariaman district) and one in Kepulauan Riau (Anambas Island District). The management unit to support them has already been established in Pekanbaru, and staff is in residence. A third national MPA requested by the Government of Indonesia for COREMAP—CTI's support is Gili Islands (three undeveloped islands already receiving conservation programming and eco-tourists) in North Lombok District. This MPA will be supported by the national field management unit of the Ministry of Marine Affairs and Fisheries (MMAF) in Pekanbaru as part of ADB's COREMAP—CTI project.

II. North Sumatra Province

6. The COREMAP II project began operating in three districts in North Sumatra: Nias (12 villages), South Nias (6 villages) and Tapanuli Tengah (5 villages). During the life of the project, Nias district split into North Nias, West Nias districts and Gunung Sitoli municipality, complicating the implementation of the project that remained in North Nias ADB villages. The Provincial Fisheries Office is the primary government partner in the Sea Partnership Program Consortium (SPP or *Program Mitra Bahari*, see section below on organizations) hosted by the University of North Sumatra (USU). All three districts supported by COREMAP II are located on the western or Indian Ocean side of Sumatra, and therefore are very close to the Sumatra Fault and submarine subduction zone that has been predicted to generate a major earthquake (Magnitude 8.0-9.0) and tsunami within the next decades. Only North Nias will continue under COREMAP—CTI.

7. Nias is a maritime district comprised of 37 inhabited and 95 uninhabited islands, with a total area of 5,625 km². The district's marine waters are relatively quiet of marine traffic due to their isolation. The industrial sector provides the largest contribution to North Sumatra's economy (23.3 %), followed by agriculture (23%) and trade, hotels and restaurants (19%). The MMAF's University Sea Partnership Program (SPP) is implemented at the provincial level by a consortium consisting of the Marine and Fisheries Agency, local universities and other stakeholders. The regional center in North Sumatra is North Sumatra University.

A. North Nias District

8. The island of Nias is located 125 kilometers off the west coast of North Sumatra. It is isolated, remote and just 100 kilometers north of the equator. It is part of a long chain of islands which together form the western boundary of Indonesia. Nias is 130 kilometers long and 45 kilometers wide, with an area of 4,772 square kilometers. The west coast (facing the Indian Ocean) has calm bays with coral reefs, and there are a few natural harbors from which trade is

carried on, mainly within Sumatra. The mountainous interior is covered with impenetrable, tropical rain forest, crisscrossed by deep ravines and fast flowing rivers. North Nias district includes 19 islands, 113 villages with a total population of 132,605 (2011). About 30% of its population is considered poor, and the economy is based on agriculture and fisheries. Recent government efforts have improved travel to Nias. Daily flights now operate between Medan and Gunung Sitoli, (the Nias capital) two times a week, and smaller aircraft fly to Sinabang and Meulaboh. A daily ferryboat links Sibolga to Gunung Sitoli and Teluk Dalam.

1. Coastal Ecosystem and Fisheries

9. Nias fisheries supported 2,017 fishermen who landed 8,960 tons of marine fish, collected 5.04 tons of mariculture products, and 6,924 tons of aquaculture products (2011). Tourism is becoming a viable economic sector due to Nias's rank with the top ten best surfing sites in the world, and the regular visits of cruise ships whose passengers are interested in Nias megalithic "Stone Age" culture.

10. There is a marine protected area in Nias (established in 2007) of 29,000 hectares of which 4,000 hectares have coral cover. Live coral cover ranges from 5.7-26.3% (2010), overall the district's reefs are classified as poor to moderate condition. The main threats to coral reefs include over-fishing and destructive-fishing practices. Fishers from the neighboring district of Sibolga possess more advanced fishing equipment and are able to exploit resources over a larger area than local fishers. COREMAP II supported a total of twelve villages from three sub-districts in Nias Island. The area is utilized for sustainable fisheries activities, marine tourism, research and socioeconomic development of communities, and sustainable use of other marine resources.

11. The approach in determining conservation areas is based on quantitative analysis of geographical conditions, ecological conditions of its waters especially the coral reefs, pattern of marine utilization, and the impact on coral reefs and the response of the local community. The determination of conservation area zoning is still based on the purpose of protecting the coral reef areas that have high biodiversity values.

2. Economy and Livelihoods

12. The people around the Regional Marine Conservation Area in Nias Regency make their livelihoods in the field of fisheries. However, they still carry out their fishing activities in the traditional way-most still use boats without motors and outboard motor boats. The fishing gears they use are mostly fishing rods bottom long lines and drift nets. Marine aquaculture activities are still limited to breeding fish in floating fishnets. The fish seeds captured from the wild are kept in nets prior to sale. This aquaculture activity is still traditional. In addition, the floating fish nets are used as temporary shelters for catching fish, and then sold to consumers after their numbers are considered sufficient. Although the community's fishing fleet is predominantly boats without motors and outboard motor, the fish production of fishermen in Nias Regency reached 5,707 tons in 2005, with a production value of Rp17.6 billion.

13. Nias Regency has many potential locations to be developed into tourist destinations, one of which is Asu Islands, a remote island in the Hinako Islands and one of the outer island of Indonesia. The island is approximately 18 kilometers, with around 20 families living permanently there. The island's seas can reach 3-4 meters, appropriate for surfing.

3. Legal and Policy Status

14. The legal basis for the establishment of Regional MPA in Nias Regency is Nias Regent Decree No. 050/139/K/2007 issued on 29 June 2007.

B. Tapanuli Tengah District

1. Overview

15. Tapanuli Tengah District is one of area in the Western Coastal of Sumatera. It is located at 1°11'00"–2°22'00" North Latitude and 98°07'–98°12' East Longitude. The coastline of Tapanuli Tengah extends for 200 km. The total area of coral reefs is 1,223.64 ha. Coral reefs are found in 11 of Tapanuli Tengah's 20 sub-districts in Central Tapanuli. Tapanuli Tengah contains about 30 coastal villages, of which five were included in COREMAP I. Of these, only three participated in COREMAP II: Magnate, Sitardas, and Buts Nauli I.

2. Coastal Ecosystem and Fisheries

16. Tapanuli's terrain is mountainous, with peaks rising to 1,266m above sea level. Most of Tapanuli Tengah is bordering on the ocean so that the air temperature is classified as a tropical area. The average air temperature in Tapanuli Tengah District during 2011 was 26.2°C. As with other regions in Indonesia, Tapanuli Tengah District has a summer and rainy season. Summer occurs from June up to September and rainy season on November up to March.

17. The coastline of Tapanuli Tengah extends for 200 km. The total area of coral reefs is 1,223.64 ha. Coral reefs are found in 11 of the 20 sub-districts in Tapanuli Tengah. The district MMAF has allocated budget for aquaculture development, gillnet procurement, fish processing improvements, small boat procurement, genset procurement for lighting bagan units (lift nets), and rumpon (fish aggregating devices) development for capture fisheries.

18. Pulau Mursula has been identified as a potential coral reef conservation area, with 50 ha of coral reefs dominated by Acroporid corals. An assessment by LIPI in 2010 indicated that 40% of the reefs are in poor condition. LIPI were invited to conduct monitoring in 2011 but were unable to participate due to other commitments..

3. Economy and Livelihoods

19. The agriculture and fisheries sector is a major contributor to the district's economy (44.51%) followed by the services sector (18.23%), processing industries (14.88%) and trade, hotels and restaurants (10.70%). Tapian Nauli I village has a population of 5,010 people (51.1% male, 48.9% female), with 1,200 households. Fishing is the principle livelihood. Average incomes are Rp600,000-900,000 per month. Sustainable livelihood activities such as catfish culture have resulted in increased incomes for community groups. Tapian Nauli I has successfully expanded from operations one pond to ten indoor units via revenues generated by the venture. Several non-COREMAP villages have adopted the catfish production technologies and systems established within COREMAP II communities, leading to fishers transitioning to catfish production as their main livelihood.

20. Catfish farming is done by community groups, especially in the very center of Tapanuli. There has been a significant impact on earnings for the target groups. Production of catfish is still not enough to meet the needs of the market, so the potential for development is

encouraging. Hatchery certification and rearing catfish training have been obtained from the Directorate General of Aquaculture. Cage culture of Grouper has been successful in Tapanuli Tengah. Grouper fingerling are shipped from Lampung. While in both Nias and South Nias regencies, aquaculture was not progressing. The main barriers are custom and culture, which is a large challenge for the Fisheries Office (DKP) in Province. Nias people seem to prefer to use of their fields for rubber farming rather than developing aquaculture.

21. High investment costs have limited expansion of grouper culture. In addition, there is currently only one buyer, and consequently market values are heavily controlled. Development of private sector shrimp and grouper farms has been proposed, with potential employment opportunities for community members. Two factors were identified as having a strong influence on the success of culture programs: (i) ability to access loans and capital; and (ii) availability of low value feed fish.

22. An Electrical plant (PLTU- Pusat Listrik Tenaga Uap) and PT Timber have been established near Tapanuli Nauli 1 village, with these businesses occupying mangrove habitats.

4. Legal and Policy Status

23. Tapanuli Tengah has established an AgroMinapolitan program in collaboration with the provincial government of North Sumatra and the Minapolitan program of the Ministry of Marine Affairs and Fisheries. Decree No. 1421/DKP/2007 provides the legal basis for establishment of regional marine and conservation areas (KKLD). MPAs are a priority strategy to support sustainable fisheries and tourism development. Local regulation No. 24/2007 provides technical guidance on the management of coral reefs. Village regulations supporting coral reef conservation have been established in Tapanuli Nauli I and Sitardus.

III. WEST SUMATRA PROVINCE

A. Overview

24. West Sumatra consists of 19 districts and cities, seven of which are located in coastal areas (Kota Padang, Pesisir Selatan, Padang Pariaman, Kota Pariaman, Agam, West Pasaman and Mentawai). Coastal sub-districts number 42, with 89 coastal villages (nagari). The coastal population is about 1,363,322 people. Padang is the provincial capital. COREMAP II and COREMAP—CTI will operate in Mentawai Islands. In addition, the MMAF Field Technical Unit (UPT) that will manage a national marine protected area in the area (Pulau Pieh) which is close to the City of Padang and the district of Pariaman.

25. The coastline of West Sumatra extends for 315,718 km, with coastal waters covering 186,580 km². West Sumatra also has four large lakes: Singkarak Lake, Maninjau Lake, Diatas Lake, and Dibawah Lake. Coastal ecosystems consist of mangrove forests (43,186 ha), seagrass beds (no available data on extent), and coral reefs (36,693 ha). Mangrove forests are distributed throughout the province, with the largest forest located in Mentawai. Research and monitoring of mangrove habitats in West Sumatra indicates that 77.33% are in good condition, 15% are damaged, and the remaining 7.67% are in fair condition. The main threats to mangroves are harvesting for firewood and construction materials, and conversion of habitats to residential development, agriculture or aquaculture. Mentawai contains about 96% of the province's coral reef habitats (35,218 ha), followed by Pesisir Selatan with 3% (1,065 ha). Issues facing marine and coastal management include degradation of coastal ecosystems and declining fishery resources.

26. The guiding principle of coastal resources management in West Sumatra is the support of economic growth and sustained prosperity with conservation in mind. This principle influences several strategies, including strengthening of MCS, coastal, marine and small island resource management; improvements of fishing infrastructure optimization of aquaculture potential and development of fish processing industries. To support implementation of policies the provincial government established local regulations (perda) on corals and small island management in 2012.

B. Economy and Livelihoods

27. The agricultural sector, including fisheries, contributes 25% of West Sumatera's total GDP. The fisheries sector is 13% of agriculture sector, the third most important component after crops and plantations. The agriculture and fisheries sector provides employment for 44% of the coastal population. There are approximately 34,584 fishers in West Sumatra, or about 0.7% of the total population.

28. West Sumatra has considerable fisheries potential (pelagic, demersal and molluscs), with annual capture fisheries production of 312,550 tons. However, this great potential has not yet been able to provide for the welfare of coastal communities. West Sumatra has 8,729 fishing units (2011 statistics), consisting of 3,858 units with outboard engines and 2,573 unpowered units. Only 58 units above 30GT are recorded. The coastline is exposed with large waves, limiting the range of the fleet. MMAF reports indicate that the fishery management area adjacent to West Sumatra (WPP 572) is fully exploited for demersal fish, shrimp and large pelagic fish. The stock status of small pelagic fish is moderate.

C. Sea Partnership Program

29. The Sea Partnership Program (SPP) has been established in West Sumatra since 2003, with four universities (Andalas University, University of Bung Hatta, University of Eka Sakti, and the State University of Padang) and one local NGO (Minang Bahari) as members. The SPP was not actively involved in COREMAP I and II in West Sumatra, and has no special program related to the Coral Reef Management because it lacks the funds to administer the program independently. Cooperation with provincial and district DKP could be improved, with coordination currently relying on personal relationships.

D. Other Institutions

30. SUPM Pariaman, a fisheries high school, was established in 1986 under BPSDM. It contains three departments: Technical Marine Fisheries, Fisheries Aquaculture and Nautical Marine Fisheries. In 2013, a new Fish Processing Technology program will be offered. SUPM Pariaman is currently building a hatchery that will be used to develop grouper seed stock. The school also has floating cages in Pesisir Selatan that are operated through community programs.

31. SUPM Pariaman offers several vocational training programs, including Fishing Vessel Engineers (Atkapin); Vessel Nautical Officer (Ankapin); and Basic Safety Training (BST). The facility is often used by the provincial MMAF to provide training to fishers.

E. Mentawai Islands District

32. The **Mentawai Islands** are a chain of about seventy islands and islets off the western coast of Sumatra in Indonesia. Siberut (4,030 km²) is the largest of the islands. The other major islands are Sipura, North Pagai (*Pagai Utara*) and South Pagai (*Pagai Selatan*). The islands lie approximately 150 km off the Sumatran coast, across the Mentawai Strait. The indigenous inhabitants of the islands are known as the Mentawai people. The Mentawai Islands have become a noted destination for surfing. The Administration area of Mentawai consists of 10 sub-districts and 43 villages. Around 33 of these villages are located in the coastal area. Based on data from BPS (SP 2010), the population of the Mentawai Islands regency in 2010 was 76,174. Mentawai has high potential for geological and meteorological disasters such as earthquakes, tsunamis, floods, coastal erosion, landslides and tidal waves. A change in the ecosystem due to global warming also causes the higher potential risk.

33. The islands have been separated from Sumatra since the mid-Pleistocene period, which has allowed at least twenty endemic species to develop amongst its flora and fauna. This includes five endemic primates: the Mentawai or Kloss Gibbon (*Hylobates klossii*), Mentawai Macaque (*Macaca pagensis*), Siberut Macaque ("Macaca siberu"), Mentawai leaf-monkey (*Presbytis potenziani*), and snub-nosed monkey (*Simias concolor*). Some areas of the Mentawai Islands rain forest ecoregion are protected, such as the Siberut National Park. Red Junglefowl and the Crab-eating macaque are also native.

34. Earthquake and tsunami activity has been high since the 2004 Indian Ocean earthquake. In 1833, the region was hit with an earthquake, possibly similar in size to the 2004 Indian Ocean earthquake; another large earthquake struck in 1797. On 25 October 2010, an earthquake in southern Sumatra led to a deadly tsunami that devastated villages in South and North Pagai.

1. Coastal Ecosystem and Fisheries

35. Mangrove forests in Mentawai represent around 60% of the total mangrove area for the province. Mentawai also contains about 96% of the province's coral reef habitats (35,218 ha), followed by Pesisir Selatan with 3% (1,065 ha). Live coral cover in the district had increased until 2010, but then decreased from the condition of 25% in 2010 to 18% in 2011. The decline was caused by the tsunami that hit parts of Mentawai in 2011. In addition, the decrease was also due to the increasing number of boats that drop anchors on the coral reef. The ships are mostly bringing surfing tourists to Mentawai.

36. Fish catch per unit effort using net gear increased significantly from 6.7 in 2008 to 54.2 in 2011 while using fishing gear also experienced a very significant increase. The Mentawai district marine conservation area has an area of 50,523 ha; shared between the two islands of Pulau Saibi Samukop Saliguma (1,962 ha); and Katuri (3,258 ha).

2. Economy and Livelihoods

37. Between 2005–2011 COREMAP and Mentawai have established 181 community groups that operate within the MPA, such as cultivation seaweed, seaweed processing, fish processing, coastal stalls, mud crab farming, patchouli oil processing, oil refining and souvenirs.

3. Laws and Regulations

38. Resource management plan of coastal areas has been established through Decree No. 19 of 2008 and has been implemented. A Coral reef management plan has been established through the Regent Decree No.188.45-179 in 2010 but has not yet been implemented. The district MPA was established through Decree No. 178/Th 2006 and already had a unit manager and office established.

39. Mentawai is operating through the development strategy of a Minapolitan, preparing the zoning plan for the Coastal Areas and Small Islands, and the District Siakakap Minapolitan Zoning Plan. This approach requires developing the management of coastal areas and small islands that involve two or more ecosystems or resources, the utilization and disaster mitigation in an integrated manner in order to achieve sustainable development.

F. Pulau Pieh (National Conservation Area/ Padang-Pariaman) District

40. Pieh Island of about 39,900 ha was originally an island run by the "Basyiruddin" family for generations who reside in the village of Ulakan Tengah Village, Sub-District Tapakis Ulakan, Padang Pariaman District. Through a long process an SK (Executive Order) head of the Regional Office of the Ministry of Forestry of West Sumatra Province (Number 3354/Kwl-5/1994 dated November 24, 1994) and the SK (Executive Order) of the Governor of West Sumatra Tk.I No.522.51/1903/ILH -1995 dated 10 August 1995 on the Proposed Establishment of Marine Protected Areas of Pieh Island, this process to establish the MPA took more than 6 years. Pieh Island area was finally designated as a Marine Nature Tourism Park by Ministerial Decree No. 070/kpts-II/2000.

1. Overview

41. Pieh island and surrounding waters have potential for marine resources and marine life that needs to be protected and can be developed for the use of marine tourism. The potential Pieh Island includes coral reefs, unique underwater topography, reef fish, turtles, mangroves, other biota, white sand beaches and clear seas. A unique character of the island Pieh is the land area in the center of the island is swampland that is directly connected to the sea, where the height of the water in the swamp was heavily influenced by the tides. This area can be developed as a natural aquarium that could be very attractive for tourists.

42. A spatial plan already exists, and related regulations have been established. The spatial plan defines the boundaries of Pulau Pieh (national) marine conservation area. The island of Pieh falls under the administration of the district of Padang Pariaman. The conservation area incorporates waters under the jurisdiction of three districts—Kota Padang, Kota Pariaman and Padang Pariaman—and effective coordination between these governments is essential. The zoning system for Pulau Pieh has not yet been established. The area contains no inhabitants, and the nearest communities are 20 minutes away by speedboat.

43. The Minister of Forestry and Plantations designated Pieh Island and its surrounding waters as a Marine Nature Park area (TWAL) based on Decree No. 070/Kpts-II/2000 with a total area of 39,900 hectares. TWAL status is established if the marine protected area has high marine biodiversity and the environment that allows it to be developed as a tourist attraction.

44. The protected area has the objective of Marine Nature Tourism Park Pieh Island; it includes the surrounding sea, consists of several islands, namely the island Bando, Pieh Island, Island Air, Toran Island and Pandan Island. The region has an area of 39,900 hectares and has

been established by the Decree of the Minister of Marine Affairs and Fisheries No. PEM. 70/MEN/2009 of the National Water Conservation Area Establishment of Pieh island and the surrounding sea in the province of West Sumatra. Pieh islands and the surrounding marine waters are designated as a Tourism Park (TWP).³ The new TWP Pulau Pieh will be supported by the MMAF Field Management Unit in Pekanbaru.

IV. KEPULAUAN RIAU PROVINCE

45. In Riau, almost 100% of the coral reef area lies in four of the Province's 10 maritime districts. Three of these districts (Kota Batam, Bintan⁴ and Natuna) are priority areas for ADB's COREMAP program. In addition, Anambas Island is the site of the largest of the new MMAF Marine Conservation Areas that will be supported by the Ministry's Field Technical Unit and this Project. All of the districts in Province of Kepulauan Riau are on the Paparan Sunda Continental Shelf and therefore are shallow seas, compared to the western side of Sumatra which borders the Sunda/Sumatra oceanic trench, fault and subduction zone, so waters there are quite deep close to shore.

46. **Coastal Strategies:** Riau Province can be broadly categorized into four strategic areas: (i) Tanjung Pinang as the site of central government; (ii) Natuna as a shipping route; (iii) Lingga as an agricultural area; and (iv) Anambas as an important fisheries, maritime and marine tourism location. The province is committed to develop Regional Marine Conservation Areas (KKLD) at several locations, including important turtle habitats of Mangkeng Island. During COREMAP I Riau was a district, and became a province by the inception of COREMAP II. A structural change in COREMAP activities also occurred, with COREMAP I implemented by Bappeda whereas COREMAP II was implemented by the MMAF.

47. There are two recent provincial legal documents produced: Governor Regulation No. 7/2011 on the use of coral reef ecosystems for economic activity and Governor Decree Number 3/2010 on the management of coral reefs. A strategic plan on the management of coastal areas and small islands is expected in 2013.

48. The Sea Partnership Program was established in 2002, and become operational in 2004. The regional center was established in Raja Ali Haji Maritime University (UMRAH) in 2007. SPP has not been effective because there is no SPP strategic plan for Riau and no infrastructure to support SPP activities. An MOU was established with the MMAF and Ministry of Education, but activities never developed.

A. Bintan District

49. **Location Overview:** Bintan District stretches from the Malaysia Peninsula and Singapore in the North to Bangka-Belitung Islands to the south, between 0°6'17" North–1° 34'52" North, and 104° 12'47" East–108° 2'27" East. The Bintan borders include Natuna district to the immediate North, Lingga district to the South, Batam city and Tanjung Pinang to the West and West Kalimantan/Borneo to the East. It is a district but is near is size and activity to a municipality, and already has a large active coastal tourism area developed.

³ (MMAF Website: <http://kkji.kp3k.kkp.go.id/index.php/en/marine-protected-area-data/details/7/70>)

⁴ Kepulauan Riau or Riau Islands District was renamed in 2006 to **Bintan district** to avoid confusion between the district and the province).

50. Bintan District consists of 240 large and small islands, with less than 40 populated islands; many of the rest are used as cultivation or farming areas. The Bintan coastal area is part of the Paparan Sunda Continental Shelf, with the islands resulting from ancient erosional landslides. The district is 88,038 sq. km in area with only 2.2% (1,946 sq. km) as land. Gunung Kijang on the eastern part of the main island is the largest sub-district (344 sq. km), with Tambelan as the smallest area (about 91 sq. km).

51. **Coastal Ecosystem.** Bintan District has around 8,900 ha (2010) of mangrove forest area with 58% in good condition. The mangroves have a very high biodiversity, with 50 species and 27 families of mangroves (primarily *Rhizophora* and *Avicenia* genus) that spread along Siolong Island, Kelong Island and Bakau Bay. Communities still utilize mangrove wood for firewood and construction material, which has degraded the mangrove ecosystem in the last 10 years.

52. There are almost 9,100 hectares of coral reef ecosystems in Bintan District and about 50 per cent are in good condition. They are found throughout Gunung Kijang, Bintan Timur, Benua Island, Ibul Island, Birah bay and Sengkabuk sub-districts. Generally, live coral-cover in Bintan District recorded 58.9% or good condition (refer to Reef health monitoring research by CRITC Coremap-LIPI, 2007). In COREMAP location, live coral cover range between 10-50%. During COREMAP II, live coral cover increased average 5% from 54% in 2007 to 61% in 2011. The catch per unit effort (CPUE) using nets declined from 69.2% in 2008 to 52.4% in 2011. Meanwhile using hook and line increased during COREMAP II.

53. **Endangered Species:** In the past, Bintan Island supported very large populations of turtles. Nests of both hawksbill turtle (*Eretmochelys imbricata*) and green turtles (*Chelonia mydas*) were observed daily on the coastline of Bintan Resorts during nesting season. Currently, turtle nests are rarely seen although turtle tracks, nests and eggs have been recorded during surveys conducted during specified periods. The Research and Development Department and Environmental & Health Division of Bintan Resort are encouraged by their patrolling efforts and they are confident that sea turtle nests can be protected on Bintan and in local villages. Bintan has also adopted the dugong as a branding icon.

1. Economy and Livelihoods

54. The industrial sector employs the greatest proportion of Bintan's workforce (20.9%), followed by the agriculture sector. 8,000 district households were employed in the marine fishery sector, with 6% involved in processing and marketing of marine products. The area has strong potential for palm oil development, and this sector is expected to support economic development. Areas for tourism development have been identified, e.g., Trokora Beach, and some areas that have been purchased by foreign investors.

55. Women's community groups are involved in the production of mackerel fish crackers that are sold in Bintan and exported to Malaysia, Singapore and Turkey. The group has also established contact with SMESCO in Jakarta, an NGO that helped them develop their business model and access markets. One obstacle to the development of this activity is the lack of buildings for production, with private houses currently used. Women's groups were also trained how to produce handicrafts, but these were of poor quality.

2. Legal and Policy Status

56. Bintan is actively promoting their district for marine conservation sites and activities, including having the first Seagrass Sanctuaries in the country (see box below) to provide habitat to the dugong, and undertaking artificial reef activities with MMAF towards rehabilitation that were apparently successful. Below are some of the policy advances already in place for Bintan; Bintan Strategic Plan 2009-2014; Decree No. 12/ 2008 on Bintan Spatial Plan; Decree No. 13/II/2009 on Coral Reef Management; Decree No. 261/VIII/2007 on the establishment of marine protected areas; Decree No. 25/ 2010 on the zoning and management plan for Bintan regional marine conservation area; Decree No. 7/2009 and Decree No 20/2010 established a Regional Technical Implementation Unit (UPTD) for the management of marine conservation areas and Turtle conservation implemented, enacted through law UU No. 5/1999 under the Ministry of Forestry. Hence there is overlapping jurisdiction among agencies. Bintan District has a District Decree on coastal management (CRMP) that is being implemented. However, as of 2012, there is no legislation for coastal management (PERDA) in the district. Bintan District also has a District Spatial Plan for 2011–2031. The District Spatial Plan includes four marine conservation areas in Tambelan, Gunung Kijang, Teluk Sebong, and Bintan Pesisir.

PUBLIC AWARENESS IN SEAGRASS AND DUGONG CONSERVATION AT BINTAN, RIAU ARCHIPELAGO⁵

The first seagrass sanctuary in Indonesia was established in the District of Bintan, Riau Archipelago in 2010. Along with this, the dugong (*Dugong dugon*) was also adopted by the local Government as 'flagship species' symbolizing the spirit of the region in the protection and conservation of dugong, the herbivorous marine mammal that has been designated as vulnerable to extinction by IUCN (International Union for the Conservation of Nature).

The story began when a UNEP-GEF-SCS-sponsored project was executed in the east coast of Bintan Island, with the main objectives to better manage the seagrass ecosystem in the area. The Executing Agency was LIPI (Indonesian Institute of Sciences) while the local Implementing Agency was BAPPEDA (Regional Development Planning Board) of Bintan. The project started in 2007 and terminated in 2010.

Basic study of the coastal zone of the east coast of Bintan was done thoroughly by LIPI. Beside that, an intensive public awareness campaign was performed by producing and distributing awareness materials such as booklets, leaflets, brochures, posters, billboards, newsletters, T-shirts etc. Interactive radio-talks with the topic on marine conservation were broadcasted regularly through the local radio-station (Radio Republik Indonesia, station Tanjung Pinang). Focal Group Discussions (FGD) were organized frequently with the local community on the topic of seagrass conservation. A writing competition on the same topic was conducted among high-school students, while Seagrass Information Centers were established in three villages.



*Poster on Dugong conservation in
Bintan*

Under the guidance of LIPI's scientists, the local community held activities and then decided to establish seagrass sanctuaries in their coastal waters. A seagrass sanctuary is a designated sea area set aside as a no-take zone where no extraction of marine biota was allowed. Only the biota that "spills out" of the sanctuary boundaries can be harvested or collected using non-destructive methods. The management of the sanctuaries was done by the community themselves where village regulations were issued with sanctions. Later on the District Government issued umbrella regulations in supporting the village regulations.

Complementary to this, the Bupati (Governor of the District) issued a declaration to adopt the dugong (*Dugong dugon*) as a 'flagship species' of Bintan (Decree No. 27/2010) symbolizing the spirits to protect and conserve the dugongs in the region. Ever since, the icon was used for many programs in the region, such as for the tourism campaign. During the last four years, three dugongs entangled in fishermen's nets were successfully rescued and released back to the sea by the local community with enthusiasm to save the dugongs.

Another positive outcome of the Project was that the scientific information collected was used in supporting the development of spatial zoning plan for the region.

(www.seagrass_indonesia.oseanografi.lipi.go.id)

⁵ Source: State of the Coral Triangle Report, Indonesia, 2012.

B. Batam Municipality/City

57. **Biophysical Overview** Batam city is located between: 0° 25' 29" - 1° 15' 00" of North Latitude - 103° 34' 35" - 104° 26' 04" East Longitude, and is directly south of Singapore. Batam City borders with Senayang sub-district toward the South, Karimun District, the West-North and Bintan toward the East. The average number of rainy days is 222 (2007), and rainfall averages 2,929 mm/year. The land surface of Batam City is mostly flat land, while hilly areas reach 160 m. There are meandering small rivers surrounded by jungle away from the urban zones.

1. Coastal Ecosystem and Fisheries

58. Batam Municipality is mostly flat land, while the hilly areas are reach maximum of 160 meters. There are small rivers slowly flow and surrounded by jungle. Batam is highly urbanized, and densely populated, but has a small land area of 1,011 km². Capture fisheries employment is low, most people working in the fishery industries are involved with processing of marine products.

59. Coastal ecosystems are similar to the neighboring island of Bintan with mangrove forests, seagrass meadows and coral reef areas. Mangrove ecosystems have been degraded due to land conversation to residential areas, industrial development and illegal logging for firewood and constructions, and currently cover about 13,000 ha. This reduction is mainly due to residential land conversion, industry development and illegal logging. Total coverage area of coral reef in Batam City is about 66.867 ha (LIPI 2010), live coral cover in Batam average is fair to good condition. Live coral cover in Galang Island (37.37%), Dahan Island (83.6%), Karas Island (35.3%), Karas Besar Island (80.07%) and Karas Kecil Island (53.,97%). The live coral cover in Batam City increased about 5% during COREMAP II program from (57.8% in 2007 to 60,2% in 2010).

60. **Protected Area.** The Batam City already identified and declared Local Marine Management Area (MMA) through Mayor Decree No. KPTS.114/HK/VI/2007. The MMA in Batam covered about 66.807 ha. Dinas KP Batam city also already formed technical unit to manage the MMA. But, until now, there is not management plan yet. Government of Batam city already established several areas to protect coral reef and mangrove ecosystem and has established a marine park and small island protected area. All villages in Batam City that participated in COREMAP Program also already declared village Marine Protected Areas which is also known as Daerah Perlindungan Laut (DPL). Total area coverage for these DPL in Batam is 188,967 ha. Abang Island (56.618 ha); Air Saga (24.395 ha); Petong Island (22.132 ha); Nguan Island (16.835 ha); Sembur Island (30.655 ha); Karas Island (20.079 ha) and Mubut Island (6.440).

61. Marine capture fisheries, with some development of aquaculture in recent years, dominate the fisheries sector in Batam City. Fish-capture production in Batam recorded 22,672 tons in 2011 (decreased from 24.241 tons in 2010). The number of fishermen in Batam City is 9,492 persons in 2011. Total fishing vessels in Batam (by tonnage in 2011) are: 3,035 non-motorized boat; 3,116 outboard-motorized boats; 3,895 boats with 0-5 GT; 342 boat with 6-10 GT; 131 boats with 11-30 GT and 55 boats over 30 GT.

2. Economy and Livelihoods

62. Batam is densely populated, with a total population of 944,285 (2010 census). In 2011 the manufacturing industry was the dominant income source at 57,85 % of GDRB, followed by

Trade, Hotel and Restaurant sector that contributed about 25,72%. The Agriculture/fisheries sector contributed only 1,18% of GDRB for the District. Batam is a busy transportation hub, with six sea ports (and an international ferry port) and a busy International airport that recoded 1.63 million passengers in 2011.

3. Legal and Policy Status

63. The Government of Batam's stated mission for 5 year development is *"to support a successful mission of the Kota Batam to become a Modern Airport internationally as the investment area which is equipped with trade center, industrial area, tourism industry, marine resource management through cooperation with area management and stakeholders"* (RENCANA STRATEGIS 2011-16). Clearly there is a thrust toward urbanization and rapid infrastructure development, with some budget for both fisheries livelihood development (aquaculture, mariculture, marketing) and CRM efforts.

64. Key policy documents in place include: Mayor Decree No. KPTS.114/HK/VI/2007 on initiating/establishing a Local Marine Management Area (also known as DPL); Mayor decree no. 27/2011 for a Regulation on Coral Reef Management; and the formation of a district MPA management unit.

C. Lingga District

1. Overview

65. Lingga District is located between 0° 20' North Latitude, and 0° 40' South Latitude, and 104° east longitude and 105° east. The area of land and ocean area is 454,567,162 km². The land area is 2,117.72 km², and the sea area is 433,389,962 km². Lingga District consists of 531 large and small islands, of which 95 islands are populated. Sea and western: Indrigiri Hilir. COREMAP II was implemented in 6 villages in Lingga District, namely: Penaah, Batu Belonang, Temiang, Benan, Limbung and Mamut.

66. Most of Lingga District is mountainous. Lingga has tropical wet and dry seasons, with rainfall average of 1,972 mm/ year (2010). The rainfall occurs in every month during the year, but peaks in June and November.

67. About 90% of total area in Lingga district is covered with water, and only 10% of the remaining area is terrestrial. More than 95% of terrestrial area is covered with forest. Cultivated land comprises only 3% followed by residential area (1%) and mining (0.5%). Total forested area in Lingga District is 82,845 ha, with three categories: low-land primary forest (7,361 ha), low-land forest (73,250 ha) and mangrove forest (2,334 ha). The two most productive crops in Lingga District are sago palm (1,081,298 tons) and rubber (407,140 tons). Food crops subsector consists of cassava and sweet potatoes and totaled 6,393 tons (2011).

2. Coastal Ecosystem and Fisheries

68. Live coral cover in Lingga District declined dramatically from 56percent in 2010 to about 37% in 2011. The decrease in live coral cover in Lingga could be attributed to bauxite mining as well as illegal fishing activities. The catch per unit effort (CPUE) using hooks and line declined by approximately 1% per year from 2008 to 2011. Likewise net use, in the same period exhibited a decreased of CPUE from 18.06% in 2008 to 13.7% in 2011.

69. The marine fishery subsector in Lingga produced about 18,310.988 tons in 2009 and increased to 21,560.931 tons in 2010 (17% change). Lingga vessels included 2,715 motor ships, 124 motorboat, 2,391 non-motorized boats and 1,025 units of fish nets.

3. Economy and Livelihoods

70. The government of Lingga has a special focus on mariculture and marine tourism in its development objectives. Agriculture contributes the greatest portion of Lingga's economy (35.82%), followed by trade, hotels and restaurants (22.82%) and transport and communications (10.18%). Aquaculture (particularly grouper culture) is still developing in Lingga, but has good prospects due to proximity to the markets of Singapore and favorable transportation links.

71. Lingga has two annual marine tourism events (Tour the Benan and Fishing Festival), with considerable potential for further development. Benan village community has already seen significant benefit from the event by providing accommodation for tourists, mangrove tour packages, coral transplantation tours, etc. The Department of Tourism, Lingga has facilitated the development of a tour management group, with LPSTK members actively involved.

72. Marine capture fisheries, with some development of aquaculture in recent years, dominate the fisheries sector. Lingga's fishing fleet consists of 2,716 motorized units, 2,391 non-motorized units, and 124 units with outboard motors. In 2011 10,836 households stated fishing as the primary livelihood.

73. A grouper hatchery has been established, but needs additional equipment (e.g., generators and aerators), technical expertise (estimated five personnel) and seed stock. Grouper fingerlings are imported from Bali, Lampung, and Batam, but the quality is low and mortality rates are high. Feed fish are difficult to obtain from December to March, resulting in high costs to farmers.

74. Under COREMAP II community groups (10 people) in Limbung village were supplied with 1,000 fingerlings that they maintained over a 7-month grow out cycle. With each member of the group only receiving 100 fish, the revenue model was unsustainable. Limbung LPSTK estimates that 2,000 fish are needed per person, with shorter grow out phases, to ensure revenues are sufficient to improve the welfare of the community.

75. Incomes are low during the north monsoon season December to March, when poor weather influences fishery and agricultural production in Lingga. The district government does not yet have a strategy to reduce sensitivity, while Limbung LPSTK suggests that sustainable livelihood programs must consider local conditions, with cattle production proposed as a possible option.

76. One big issue in Lingga is mining activities. Lingga District has big potential in marine and fisheries resources. But, mining activities are also highly developed in this district for at least ten years. Mining activities threaten the marine environment because of sedimentation and tailings/waste disposal.

4. Marine Protected Area

77. The Lingga District already identified and delineated a 39,000 ha district Marine Management Area (KKLD) based on an earlier decree under the Ministry of Forestry. However,

the Lingga mayor has not yet approved the KKLD (he asked to review the KKLD boundaries).

78. There is no supporting legislation or zoning plan for this area yet but all documents have been initiated. Each village has established a village Marine Protected Area (Daerah Perlindungan Laut/DPL). DPL at Limbung Village covered 18.75 ha, Sekanah (314.11 ha), Benan village (13.38 ha), Temiang village (9.31 ha), Batu Belonang village (31.80 ha), Mamut village (13.48 ha) and Penaah village (61.13 ha).

5. Legal and Policy Status

79. Lingga does not yet have an official document, strategic plan or spatial plan for the marine and coastal environment. A spatial plan incorporating coastal zoning is planned to be established by early 2013. A Draft District Regulation on Coral Reef Management (RANPERDA) has been submitted and is listed as item No. 4 in the Parliament's legislative agenda. A Draft Strategic Plan on Coral reef Management also has been prepared and submitted to BAPPEDA for review by the district Legal Bureau prior to approval by the Mayor.

80. Lingga District has not finalized the official coastal management plan. Other District planning regulations are also unfinished, including: the Strategic Plan of Coastal and Small Islands Zone (RSWP3K), Management Plan of Coastal and Small Islands Zone (RPWP3K), Coastal Spatial Plan for Coastal and Small Islands Zone (RZWP3K) or Action Plan for Coastal and Small Islands Zone (RAWP3K). The District Spatial Plan (RTRW Kabupaten) including coastal zone is scheduled to be approved by early 2013 and the other plans have all been initiated.

81. Draft District Regulation on Coral Reef Management (RANPERDA) has been submitted to the DPRD. A committee has been created to review the draft and has listed the item as No. 4 in the Parliament's legislative agenda. While the Draft of Strategic Plan on Coral reef Management also has been prepared and submitted to BAPPEDA for review by district Legal Bureau prior to approval by Mayor.

D. Natuna District

1. Overview

82. Natuna district encompasses 20,013 km² of land and 2,621,983 km² of ocean. The district contains 27 inhabited and 127 uninhabited islands, of which the largest are Bunguran and Serasan. The islands are distributed between two main chains, the Natuna islands (Bunguran, Sedanau, Midai, Laut and Tiga islands) and the Serasan islands (Serasan, Subi Besar and Subi Kecil). Natuna is located between: 02° 25' 29 – 04° 30' 00 North Latitude and 107° 43' 00 – 109° 10 '04 East Longitude.

83. Natuna District already approved the Natuna district spatial planning for 2012-2032. In the spatial planning document, Natuna district divided their administrative area into 4 zones: Agropolitan (agriculture) zone, Minapolitan (fishery) zone, tourism zone and industrial zone. Batubi, and Bunguran Barat are defined as agriculture zones; Laut Island is a fishery zone; Bunguran Timur is an industrial zone and also Ranai City as tourism center.

2. Coastal Ecosystem and Fisheries

84. The Natuna Islands are known for diverse marine and terrestrial wildlife. Ecologists have recorded 71 species, including the near-threatened Lesser Fish-eagle and the Natuna Serpent-eagle. The district is also known habitat for Hawksbill turtle.

85. Natuna District has mangrove forest that includes Tiga Sedanau Island (57,477 ha), Baguran Utara Island (11,271 ha) and Baguran Timur Island (1,458 ha). The coral reefs spread across islands in Tiga Sedanau Island (1,060 ha), Baguran Utara Island (7,458 ha) and Baguran Timur Island (6,182 ha). Coral reef in Natuna has average live coral cover from fair to good condition.

86. The live coral cover in Natuna District increased during COREMAP program, from 45% in 2007 to 51% in 2011. The CPUE using nets declined from 44.7% in 2008 to 15% in 2010. Meanwhile CPUE using hook and line increased during COREMAP program. Coral reef status in Natuna remained relatively stable from 2007 to 2010.

87. All of Natuna is within fisheries area WPP 711, the waters of the Sunda Shelf, and produce mainly small pelagics and demersal fish. Cage mariculture is well developed in Natuna, with 2,139 units throughout the islands, producing 196,000 in 2009.

88. Behavioral changes were documented during COREMAP II, with a significant reduction in illegal fishing (bomb and cyanide). During a 2009 survey, most respondents claimed that the area was free of bomb fishing.

89. **Protected Area.** Natuna District already identified and delineated the District MPA (KKLD) during COREMAP II program. The KKLD Natuna covers 142,997 ha, consists of marine areas and several small islands and contains mangrove and coral reef ecosystems. The KKLD Natuna was established by Bupati's Decree No. 299/2007, but it has no management plan and management boards yet.

90. **Endangered Species.** Natuna District was one of the locations where Turtles were found in large numbers. There is defined location to protect turtles in Mangkay Island.

3. Economy and Livelihoods

91. Natuna has large reserves of natural gas (estimated to be 1.3 billion m³) that is exported to neighboring countries such as Singapore. Matak Island now serves as an offshore exploitation base.

92. **Laws and Regulations.** Coral reef management plan for Natuna has been established through Decree No. Regents. 346/2007. KKLD was established through decree No.299/Tahun 2007 but has not yet formed a field management unit. A coastal area resource management plan has been approved and established by Parliament through legislation, and has been implemented.

93. **Anambas District.** The Bupati of Anambas has coordinated the development of a regional company whose role is to encourage economic development, and is open to collaborating on COREMAP—CTI activities, Anambas has not yet established a PERDA regulating a strategic plan, zoning plan or management and action plan for the coasts, Some supporting studies have been completed, and the government aims to establish conservation

and use areas for marine resources. The district's conservation strategy aims to create zoning and management plans that support the National Fisheries Conservation Zone, including establishing core zones for the protection of coral reefs, turtles, Napoleon wrasse and other species.

1. Coastal Ecosystem and Fisheries

94. Coral reefs in Anambas cover 24,730,77 ha, with 50% in good condition. Turtles and Napoleon wrasse are common. Several core zones have been identified as important turtle habitats.

95. District statistics from 2011 indicate that Anambas has 2,356 fishermen, with 2,366 unmotorized fishing units and 1,431 motorized units. The dominant fishing gears are trolling lines, longlines, gillnets and purse seines. The largest population of fishers is found in Palmatak (629 fishers).

96. Aquaculture development has focused on grouper and Napoleon wrasse culture in coastal cages and several community members in Air Sena have established grouper and Napoleon wrasse grow out facilities. Fingerlings are reared for 7-8 months and then sold to collectors. One of the major collectors in the district is PT. Jaya Siantan Sea. The company began operating in 1992 and currently employs more than 20 staff and operates 200 units. Ships from Hong Kong, Singapore and Taiwan collect product from PT. Jaya Sea Siantan every two weeks. Trash fish are used as feed and supplied 2-3 times per day. These fish are obtained from local fishermen or imported from Bintan.

97. Anambas has requested exclusion from a national moratorium on Napoleon wrasse fishing issued by LIPI. The district government and communities feel that fishing is inline with carrying capacities of the stock. Anambas produces large quantities of juveniles Napoleon wrasse, but the location of spawning aggregations has not yet been determined.

98. Capture fisheries production has remained relatively stable for the past 10 years. Local fishers do not use bombs or cyanide. In Batu Belah village, fishing is the dominant livelihood. The fishing fleet consists of larger (3-5 GT) vessels crewed by 12 people and smaller (<2 GT) vessels crewed by eight people. Larger vessels typically operate in the 4nm zone and remaining at sea for up to seven days. Penjalin and Midai islands are key fishing grounds and around 12 hours sailing. Target species include mackerel and snappers are caught via longlines.

99. Smaller vessels typically make one-day trips and use gillnets or lines to target trevally and other pelagic species. Fishing grounds are located near Mentalak island approximately two hours from Batu Belah.

100. Foreign flagged vessels are a concern to local fishers with vessels from Taiwan, Thailand and Vietnam reported. In 2012, patrolling was transferred to the navy. Local communities are concerned as they believe that the navy will focus on boarder areas, whereas foreign vessels often operate deeper within the archipelago.

2. Economy and Livelihoods

101. The population of Anambas totals 46,000 people and about 13,000 households, of which 2,000 households are considered "poor". The government's social development strategies focus on these low income households, and efforts are being made to improve the lives of fishing

communities via the Regional Planning Agency and the Regional Border Management Agency. Mining, oil and gas contributed the greatest proportion of Anambas economy (76.34%) followed by fisheries, forestry and agriculture (14.62%). Fisheries, agriculture and forestry sectors provide the greatest employment in the district (72%), followed by the trade and services sector.

102. Anambas offers considerable marine tourism potential, with several areas targeted for tourism development, including Durai Island, Bawah Island, Padang Melang Beach, Penjalın Island and the Straits of Rangsang.

3. Laws and Regulations

103. There are few regulations related to coastal, marine or small island resource management although the full suite of policy documents is underway. The Ministerial Decree No. 35/2011 initiated and established Anambas to become a national marine conservation area for tourism (TWP).

E. Gili Matra/ West Lombok District National Marine Conservation Area

104. Arching away from the northwest corner of Lombok, the Gili Islands are three atolls where the sand is still powdery white, the water is as clear as sparkling turquoise, and the sunsets over Bali's Mount Agung in the west is spectacular.

105. Gili Matra Island Nature Tourism Marine Park Nature consists of three small islands: Gili Ayer, Gili Meno and Gili Trawangan with total area of 2,954 hectares; marine management areas are about 175 ha in Gili Air with approximately 5 km around the island, about 150 ha in Gili Meno with approximately 4 km around the island and about 340 ha in Gili Trawangan with approximately 7.5 km around the island and the rest is sea water. They have been a protected area under the Ministry of Forestry since 1993. In 2009, Gili Matra joins seven other national marine protected areas now going through the process to complete requirements to become an MMAF MPA.

106. Gili Matra TWP or Toursim Nature Park will be managed by the MMAF field unit in Kupang, but supported by ADB in order to evenly distribute the supporting cost and efforts between the World Bank and ADB COREMAP CTI programs.

107. The MPA of Gili is defined as a Tourism Park and includes Gili Ayer, Gili Meno, Gili Trawangan. Its natural resources potential is high due to its biodiversity such as marine and mainland flora and fauna. The variety of marine life found includes as Soft Coral (*Heliophora* sp); (*Labophyelia* sp) and hard corals - (*Millephora* sp); (*Anthipathes* sp); (*Monthipora* sp) and others, as well as a variety of ornamental fish species (*Balistapus undulates*); (*Lethrinus nuburotus*); (*Platakpinatus*), and others. Terrestrial vegetation is found growing naturally include Acid Sea (*Temarindus indica*); Sea Waru (*Hibiscus tiliaceus*); Ketapang (*Terminalia cattapa*) and others, as well as vegetation that has been cultivated by the local community such as coconut (*Cocos nucifera*); Bamboo (*Bambusa* sp); bananas and other agricultural crops. Fauna or wildlife can be easily found among other types of land birds and wild ducks.



108. From the baseline survey just completed there are 54 genera and 148 species of coral are scattered in the three Gili's, dominated by corals growing *Acropora* species. While in Gili Indah there are 26 families and 167 species of fish, most of these fish are fish that have beautiful colors and interesting.

109. Fortunately all three Gili Islands will not permit any type of motorised transport on them and therefore rely on bicycles or horse and carts.

110. The USAID/IMACS project is working in Gili Matra, as is MPAG; on baseline surveys, policy development, livelihoods and good practices. This work will evolve into the COREMAP—CTI activities as the other projects wind down in 2014, or will go along side in a complementary way to help provide the infrastructure and other support to increase their management effectiveness.