"Management" of Marine Ecosystems in West Sumatra: Theory and Everyday Practice

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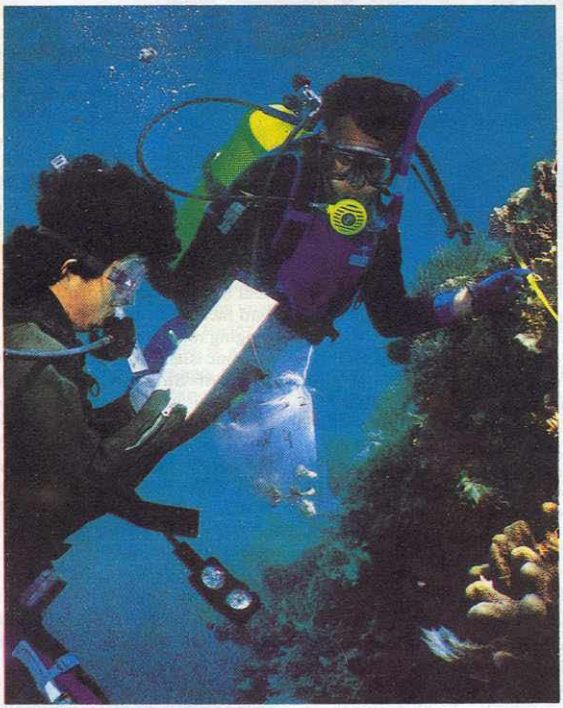
1. Introduction

Indonesia is an archipelago nation, referred to by Indonesians as "Tanah Air Kita"; two-thirds of the country is sea. It consists of more than 17,000 islands, 81,000 sq. km. of coastline, 3.1 million sq. km. territorial waters and with its Exclusive Economic Zone (EEZ) spans more than 7.1 million sq. km. sea. Some 7,000 villages are situated on the coast accommodating more than 1.5 million fishermen. It is estimated that some 185 million people in Southeast Asia depend directly or indirectly on fish as a source of income.

But the "fishy" side is not Indonesia's only surprise. It also has the largest coral reef area in the world (25% of all reefs) and is situated in the center of biodiversity, for both marine and terrestrial species. However, recent research, by LIPI for example, reveals that some 85% of Indonesia's reefs are negatively influenced by humans and some 70% are already in poor condition.

Fortunately, the Indonesian government is aware of this situation and several years ago began to implement conservation-oriented projects, emphasizing different, important goals for the marine environment. Therefore, we find the area of Marine Protected Areas (MPA) and Marine Parks (MP) currently at 28,000 sq. km. and projected to the very ambitious target of 300,000 sq. km. for the year 2000. Indonesia had the so-called "Tahun Bahari", Year of Marine Tourism in 1996, reminding the public of the importance of its seas and is actively participating in the International Year of the Reef (IYOR) and International Year of the Oceans (IYO) in 1997 and 1998. Finally, in 2000 Indonesia will host the 9th International Coral Reef Symposium of the International Society for Reef Studies (ISRS).



Indonesia is a paradise for scuba-diving

International projects like the Marine Science Education Project (MSEP), the Marine Resources

Some 70% of Indonesia's coral reef are in poor condition

Evaluation Project (MREP) and recently the Coral Reef Rehabilitation and Management Project (COREMAP), have had and will have a tremendous effect on a national scale. The most important step was the establishment of a National Council for the Sea (DKN) in December 1996 with all involved government and research institutions as members.

These examples underline the enormous progress that has been achieved over the last ten years. They prove the seriousness and dedication to achieving something on the national level. How does this translate into facts and action on the provincial level? Let me introduce the example of one province, located right on the sea, namely West Sumatra.

2. Case Study

West Sumatra represents approximately 0.6% of Indonesia, consisting of 100 islands, 450 km. coastline and 20,000 sq. km. of territorial waters. The EEZ amounts to some 140,000 sq. km. and we find 6,000 fishermen operating in the waters. From a theoretical point of view (legislation), everything is fine, regulated and under control. A compilation of laws and regulations, mainly national, but also some regional regulations, yields 27 with direct concern for marine matters.

From a more practical point of view, things look different. Five years of research on the West Sumatran "Barrier Reef System" have produced some hard facts. We find patch reefs and fringing reefs around coral islands, volcanic islands and along the main coast of Sumatra and around Mentawai island, some with mangroves and seagrass beds. The percentage covered with live coral (PC) for various locations shows some reefs with almost no coral left,as well as some spots with a very high PC. For more scientific details about the coral reefs, I refer to Hoeksema & Kunzmann (in press), Kunzmann (1997) and Kunzmann & Efendi (1996). In this paper I wish to focus on the different uses of reefs and other coastal environments.

Along the coast of Padang are found many users of the coastal area with differing significance and impacts, including villages of one million inhabitants, agriculture, forestry and mining with a heavy particle load washed down in rivers. The local industry comprises rubber and cement, a commercial harbor in Teluk Bayur with coal and cement terminals and a fishing harbor, a plywood factory and an oil-landing pier, all in Bungus. Projected on a map, we can see that the industrial and fishing activities interfere with tourism projects, like those in Pasir Kandang and Bugus, for example. In the case of the wood factory we have results indicating direct negative influence over the last years (Nusyirwan 1994). The map also reveals the areas where artisanal fishing, Bagan-fishing and most illegal fishing is practiced. Apart from a general over-exploitation, especially due to 300 Bagan units operating in the Padang area, we have the still low, but increasing pollution problem and the generally unwise use of resources, including shell-and coral-mining and turtle-egg and adult-turtle harvesting.

West Sumatra has a serious problem with fishing using explosives and cyanides on both small and large scales (for details see Kuzmann 1997a, b). Dugout canoes use selfmade mini-bombs inshore, while larger vessels from Jakarta and Sibolga use big bombs around the outer islands. Fishing with various cyanides for fish and lobsters is carried out from canoes and small boats with hookah-diving in the inshore area. A large-scale enterprise is operating on the Mentawai islands, with its base ironically in the Sarabua Bay which is supposed to be a Marine Park. There are still some unexplained facts about the licensing of P.T. Hiureksa Perkasa which involves high-ranking officials and member of the DGF and the army. This story has been intensively covered by newspapers, with little effect. PT HP is contributing to the live reef-fish trade with Hongkong, earning a fortune and giving fishermen only peanuts (see details in TNC and WWF news). As a consequence, the reefs of the Mentawai islands are in terrible condition.

What has been done so far to

change things for the better?

Formal cooperation has been established with the Navy that includes bringing out moorings and radio-communicating via a hotline. With the help of an island guard, who was equipped with binoculars and an FM-radio, we managed to get four ships caught by the Navy within six months. The crews were put in jail and the ships temporarily confiscated. The legal authorities had immense problems, because they claimed to need direct proof. One eyewitness and our own report detailing indirect proof were not enough. We were finally asked to provide an expert witness for the court session. The result was a verdict of 18 months in jail for the captain and engineer and 13 months for the crew. From that point on, the Navy and the Chief Justice managed the remaining trials on their own.

An application to protect at least one, possibly three or more, of the Padang islands brought forward already in 1994 via all official lines and some unofficial lines finally resulted in action in late 1996. We are still awaiting the papers for a marine-protected area of some 30,000 ha. in the Padang islands (Pulau Pieh MPA) and for a Marine Park at Sarabua Bay in the Mentawai Islands from the Department of Nature Conservation (PHPA)

Because this procedure was lengthy and because, unfortunately, the local press revealed the name of the core island that was to be protected (which caused fishermen to "check" for fish there), the university agreed to buy Pieh Island. Due to the extremely difficult land-ownership relationship with the Minangkabau people, where even the local government body in charge of agrarian affairs respects the "adat" rights more than the central law, we only managed to contract it for 20 years. Even this compromise was incredibly difficult to achieve.

Sea-bass farm in Aberade, Denmark

Our firsthand information regarding the illegal live reef-fish trade, including photographic evidence of netcages with adult Napoleon Wrasses, combined with the brave work of a local reporter stirred up matters for about six months. However, we still have many unanswered questions and the trade continues. On the good side, in a similar attack some years ago, two enterprises engaged in exporting corals and ornamental fish were successfully stopped.

Due to low public awareness, we deliberately placed articles in the local newspapers, gave some radio interviews and published two manuals in Indonesian, discussing the importance of marine ecosystems, and particularly coral reefs, for coastal people (Soul 1994, Tata 1993). The provincial planning board BAPPEDA has planned a public campaign, including a public awareness conference in conjunction with us.

Starting from zero in 1992, the Bung Hatta University built up a team of young people engaged in Scuba Diving and basic coral reef research activities. The so-called Pusat Studi (PSPP) formally signed cooperation agreements with LIPI's Oceanography division and the Center for Tropical Marine Ecology (ZMT) in Germany and established a solid reputation. Amongst other activities, impressive and unique reference collections of hard corals and fishes of the eastern Indian Ocean were commenced with the help of international experts. These activities were rewarded with the chair of one of seven "SIMPULs" of the Indonesian Association of Coral Reef Studies (IACRS) and with participation in the World Bank/ADB COREMAP (Coral Reef Monitoring and Management Project) project.

The Simpuls tasks and the project goals involve several very common aspects of coastal zone management. Major emphasis is on the training (development of human resources) of all involved parties and on the participation of coastal inhabitants. A detailed socio-economic study is now in progress. An extremely positive indicator demonstrating that the provincial government has acknowledged the nature and importance of the problem is the formation of a provincial Steering Committee on Marine Affairsvery much like the national DKN mentioned above.

3. What to do? What do we learn?

NATO is a common idiom to the Minangkabaues. It means "No Action Talk Only". We have experienced this in our daily life, where in the planning procedure things work out close to perfection but in sharp contrast implementation lags behind. Therefore, even one small task followed through to the very end (example: court trial of illegal blast-fishing) is worth more than ten well thought-out of proposals on what to do.

The infrastructure for enforcement, or even for knowing the problems are, is poor. The maintenance of existing infrastructure is non-existent. This is mainly a human resources problem. Effective training with **attached conditions** is needed. This training will only succeed when the necessary motivation is present and when people are convinced of what they are doing.

An integrated approach must be more strongly enforced. In West Sumatra the concept of Integrated Coastal Zone Management (ICZM) is still not yet comprehended as an advantage over other approaches. More economic arguments must be included. The planning does not acknowledge the difficulties of the Minang culture. This negligence has caused the failure of many a project.

Finally, it is not enough to blame fishermen who in the end are the ones throwing the bombs or squirting the poison from a bottle. Even stopping the entrepreneur, who by offering a market outlet is tempting the fishermen, is not the final solution. As Minangkabau culture is totally land-based, the people can never be turned into sea-lovers. Since a fishermen can never be convinced to become a farmer, incentives and alternative sources of income are needed. The provincial government of West Sumatra should take the gift of nature and introduce a soft and wisely managed marine tourism on a small scale with the involvement of many coastal people and find sufficient and sustainable ways of supporting their families.

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References

Hoeksema, B.W. and A. Kunzmann (Submitted):
The scleractinian reef coral diversity of West Sumatra related to other Indian Ocean coral faunas.

Kunzmann, A. (1997):
"The coral reefs of West Sumatra", In: Tomascik, T., A.M. Mah, A. Nontji, and M. Kasim Moosa, (eds.): The Ecology of the Indonesian Seas, Part Two. Singapore: Periplus Editions (HK) Ltd. pp 1249-1262.

Kunzmann, A. (1997):
"Status, langkah-langkah pencegahan dan penanggulangan kerusakan terumbu karang di Sumatra Barat (part one)" in Warta Penelitian Perikanan Indonesia (WPPI) 3 (2) : 2-9, part two WPPI 3 (3); in press.

Kunzmann, A. and Y. Efendi. (1996):
"Are the coral reefs of West Sumatra seriously damaged?" IOC-WESTPAC, Proceedings III International Science Symposium, Bali, November 22-26. 1994 Unesco Workshop Rep.116

Nusyirwan (1995):
"Pengaruh pembangunan limbah pabrik kayu Bungus terhadap kehidupan terumbu karang di perairan Bungus Teluk Kabung Padang, Propinsi Sumatra Barat, Universitas Bung Hatta, Padang", Skripsi -SI.

Soule, S.M. (1994):
Our coral reefs. ICLARM Educ. Ser. 15, Bahasa Indonesia in A. Von Kunzmann, (1995) Terumbu Karang Kita. Padang: Bung Hatta University.

Tata, S. (1993):
What's under the sea ? Usborne, London, 24 p. Translated into Bahasa Indonesia by A. Von Kunzmann, 1997: Ada apa di dalam laut ? Padang: Bung Hatta University. ❐

Tanks in the production plant of a fish farm