

TINJAUAN LINGKUNGAN**CONSEQUENCES OF ANTHROPOGENIC PRESSURES IN COASTAL AREAS: CONFLICT OF INTERESTS**Markus T. Lasut<sup>1\*</sup> & Veronica A. Kumurur<sup>2\*</sup><sup>1</sup> Faculty of Fisheries and Marine Sciences, Sam Ratulangi University, Manado, Indonesia<sup>2</sup> Architecture Dept., Faculty of Engineering, Sam Ratulangi University, Manado, Indonesia

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**Abstrak.** Konflik kepentingan di daerah pesisir merupakan suatu konsekuensi dari tekanan manusia sebagai dampak dari kegiatan pembangunan di daerah tersebut. Konflik kepentingan ini diperankan oleh para pengguna daerah pesisir, misalnya antara nelayan dan para pengembang. Dua jenis utama konflik kepentingan yang dapat terjadi, yaitu konflik di antara pengguna dan di antara sektor, departemen yang ada di pemerintah. Konflik kepentingan yang terjadi di daerah pesisir dibahas secara singkat dalam tulisan ini.

*Kata-kata kunci:* Pengelolaan wilayah pesisir, daerah pesisir, konflik kepentingan.

**INTRODUCTION**

Anthropogenic pressures due to development activities have consequences in the coastal area; the consequences might be as impacts to the environment or conflicts among interested users or in combination. The consequences of anthropogenic pressures in coastal areas and conflict interest are discussed in this paper.

Since each part of the users (activity, group, etc.) of coastal resources plays alone, conflicts of interests might arise as a consequence of anthropogenic pressures. There are two major of conflict interests, which can be identified regarding anthropogenic pressures in coastal area, such as conflicts among users and conflicts among government agencies that administer marine or coastal programs (Cicin-Sain and Knecht 1998; Scialabba 1998). Those conflicts are often interrelated and are driven by strong interests between the users and between agencies to exploit the coastal resources. And, due to the nature of coastal resources they are finite and limited; it is not

always easy to avoid conflict (Scialabba 1998). The conflict of interests is discussed in this following sub-chapter and ways to resolve the conflicts are discussed in next chapter.

**CONFLICTS AMONG USERS**

The term 'users' is defined to encompass those who actually participate in coastal activities (fisherman, subsistence users, offshore oil operators, and recreationists) or in support operations (fish processors), and indirect users, such as environmental groups concerned with coastal protection and members of the public who live in non-coastal areas (Cicin-Sain and Knecht 1998); thus 'users' is beyond stakeholder of coastal issues.

Conflicts among users in coastal areas may occur for several reasons. Cicin-Sain and Knecht (1998) described a variety reasons of conflict occurred among users in coastal and marine areas, they are:

1. Competition for space (aquaculture and fishing);

**Box 1.****Conflict between a gold mining activity and the local coastal community and non-government organizations (NGO) in Buyat Bay, North Sulawesi, Indonesia**

A gold mining industry operates in the upper land of Buyat District. Because this company discharges tailings [consisting of various detoxified heavy metals: mercury, arsenic, etc. (Lasut and Kumurur 2001) by using the Submarine Tailings Disposal (STD) system to Buyat Bay, the local coastal community of Buyat Bay is against the industry. Kumurur and Lasut (2001) reported that due to the industry's tailings the marine ecosystem and life quality of the community (daily activity as traditional fishermen) decreased. The impacts included decreasing the number of fish species that used to be caught, and change on fishing ground. Another negative impact is on economy including decreasing the family income from fishing activity, increasing the risk to fish (because of the fishing grounds are moved further offshore), and extra cost for health insurance due to effect of tailings on health.

The local coastal community supported by the local non-governmental organizations under the Environmental Forum of Indonesia (Walhi) were sending protests to the local government of North Sulawesi province and Ministry of Environment (MOE) against the STD system applied in Buyat Bay. The conflict is still ongoing and no conflict resolutions have been found.

2. Competition for the same resources, as when commercial and recreational fishermen pursue the same species;
3. The negative effects of one use on ecosystem harbouring another use, as in the effects of offshore oil development on fish concentration and reproduction; or
4. Competition among users for similar onshore space or facilities in ports and harbours or elsewhere on the coast, as when fishermen and offshore oil developers compete for harbour space or recreational activities competes with aquaculture.

The competition for space in coastal and marine area often occurs between industry activity against local coastal community within the area who use the area for subsistence fishery and indirect users, environmental groups. An example is coming from Buyat Bay, North Sulawesi, Indonesia, between a gold mining industry against local community and non-government organisations (NGOs) (Box 1).

The important part of those conflicts among users in coastal area is the impacts

that will always follow after the conflict. Significance of the impacts is depending on how heavy and how many users are involved in the conflicts. However, sometimes it is difficult to measure the significance of the conflicts. One option to do so is measuring the impacts to the degree of degradation of coastal resources (including the habitats and ecosystems). The major habitats and ecosystems of the coastal areas, including mangroves, coral reefs, seagrasses, lagoons and estuaries, will degrade due to the conflicts. Another impact, the most important one, is that people whose lives depend on the resources will suffer and in the end may decrease their life quality. Following are degradations that may occur in the coastal area due to the conflicts:

**Mangroves**

In recent years the pressures from settlement expansion (as a result of increasing population), industrial and urban development, and wood chipping have caused a reduction in the world's mangrove resources (Field 1999). Spalding *et al.* (1997 cited in Field 1999) estimates the current global extent of mangrove areas to be

**Box 2.****Shrimp farm threaten mangrove areas in Java and South Sulawesi, Indonesia**

(Summarized from INCUNE 2000)

Mangrove area in Java and South Sulawesi will disappear in coming several years due to conversion to shrimp farm and development activities. This happens due to high demand for new shrimp farm areas in which wastewaters from the farms are not managed. Most of the shrimp farm activities in northern part of Java discharge their wastewaters directly to the coastal areas. The impact is pollution by way decreasing water quality and then will affect mangrove ecosystem. The problems are generated by legal permission from authority that does not consider the capacity of the areas to build shrimp farms. For instance, along the coast of Jepara-Semarang-Kendal, the areas are only suitable for 3,000 ha of shrimp farms but it has been push out to more than 10,000 ha.

There is of 21,195 ha of mangrove areas along the coast of northern part of Java (the prediction is based on satellite data of Landsat TM); it consists 10,103 ha in west of Java and Jakarta, 980 ha in middle of Java, and 10,112 ha in east of Java. While the shrimp farm areas area 118,383 ha; it consists 54.281 ha in west of Java and Jakarta, 36,214 ha in middle of Java, and 27.888 ha in east of Java. So, the rest of mangrove areas in northern part of Java are less than 5%.

between 181,077 and 198,818 km<sup>2</sup>. As an example of the rate of disappearance of mangrove areas, it has been estimated (Plathong 1998 cited in Field 1999) that the mangrove area in Southern Thailand has declined by 48% between 1961 and 1996; that is from 3679 to 1905 km<sup>2</sup>.

The primary contributing factors to decrease in mangrove area are clear cutting for wood to make charcoal or for construction; and land reclamation for urban development, aquaculture of shrimp farming (Box 2), mining and industry (Paw 1987). An example from the Upper South of Thailand, land use data showed that as of 1986, 38.3 % of the total mangrove in the country had been converted for aquaculture. On the other hand, land reclamation for agriculture and urban and industrial sites was 45.6 %, whereas conversion for mining was 3.5 %. Along the Andaman Sea, tin mining has been a major source of mangrove degradation. Approximately 1.8 % of the mangrove forest has been affected. Degradation is largely a result of sedimentation from mine tailings (Paw 1987). Another example, the mangrove area in Minh Hai has substantially decreased over the last decade. This clearance of mangroves in the Mekong Delta certainly has an impact

on the marine fish production and catch (de Graaf and Xuan 1998).

A major problem that affects mangrove habitats results from human desire to convert mangrove areas to residential, commercial, industrial, and agricultural real estate by land filling. In addition, there is an increasing demand for forest wood products that results in the exploitative clear-felling of the forests (Clark 1992).

**Coral reefs**

In many countries, reefs are heavily exploited for corals, which are harvested for sale as souvenirs or decorations, building materials, and lime production. The market for coral is often quite lucrative and usually export-oriented (Clark 1992; Brown 1997). Other damaging activities include the following: 1) siltation and sedimentation created by dredging, filling, and related construction activities and increase oil erosion; 2) pollutants, including spilled oil, industrial wastewater, and domestic sewage; 3) discharge of large volumes of fresh water as may result from diversions and storm-water outfall; 4) destructive fishing practices, including dynamite; 5) collection of young fishes for sale in the aquarium trade; and 6) tourist visits to reefs, which

**Box 3.****Conflicts among governmental agencies***1. Vietnam (Sinh 1998)*▪ Between agencies: central versus local

The conflicts between central and local government are reflected through disputes between Ministry of Energy (MOE) and the Quang Ninh People's Committee. These conflicts occur because of the different economic activities being pursued in the same place. On the one hand, at the national level, MOE is interested in developing the coal mining industry for domestic consumption and especially for export. On the other hand, the tourism industry is preferred over coal mining by Quang Ninh province.

▪ Within agencies: both central and local level

In Quang Ninh, before Decisions Nos. 381 and 382 made by the Prime Minister in July 1994 to stop all small-scale coal mines licensed by relevant ministries and the Quang Ninh People's Committee, as well as all illegal private coal operations, there had been no control over license-granting procedures. It was not only the Ministry of Heavy Industry (MOHI) which issued licenses. The MOE, MOD and the Quang Ninh People's Committee were also involved. As a result, there were seven companies operating in Quang Ninh. Of the seven companies, five, along with 30 enterprises, belonged to the MOE, one company to the MOD, and the Quang Ninh coal Company to the Provincial People's Committee with four enterprises. Five enterprises belonged to the District People's Committee and one to the Provincial Party. In addition, there were several thousand illegally operated individual mines.

*2. Indonesia*▪ Between agencies: local level

Bunaken National park (BNP), North Sulawesi province, is authorized by (since 1997) a semi-Autonomous Management Unit (*Balai*) under Directorate General of Forest Protection and Nature Conservation (PHPA), Ministry of Forestry (MOF) who is responsible for the management including conservation issues of the area. Conflict is recently starting to occur within the BNP since there is a plan to develop a five stars like-servicing hotel (instead of a five stars hotel) at one of the five islands. The private investor is owner of the land. The plan has been approved by local government of Manado (*Pemda*). The jurisdiction of the BNP area is part of the *Pemda* responsibility, because this agency believe that land and people who live within the park are outside the authority of the *Balai*, and the *Balai* has authority extending only to underwater and tidal areas. These jurisdictional arrangements confuse the agencies concerned as well as local communities.

result in breakage from boat anchors and from hand and foot damage (Clark 1992).

In addition, there are also damages from natural causes such as: 1) outbreaks of reef destroying animals such as crown-of-thorns starfish; 2) diseases like whiteband (which kills elkhorn coral) and blackband (which kills large structural corals); 3) hurricanes that smash the coral and "sandblast" away the living tissue; 4) coral disablement and death from "bleaching" episodes; and 5) die-off or depletion of

essential symbionts, such as parrot fish and sea urchins that clean the reef of algae (Clark 1992).

Coral reef degradation has serious consequences for tourism, fishing, beach stability and, particularly, for coastal/marine parks. For example, most of the 21 countries and 49 parks (or reserves) in the Caribbean with coral resources have problems (ICLARM 1986 cited in Clark 1992). When serious, coral reef degradation can ruin a park and cut severely into tourism. Some



**Figure 1.** Conflicts among governmental departments (Dept.), agencies, and sectors that might happen.

reefs are virtually beyond repair (those closest to settlement) but many that are degraded could still be returned to good or fair condition (Clark 1992).

**Seagrasses**

Rapid coastal development, in recent years, has caused a decline in seagrass population in China including Hong Kong (Fong 1999). Large seagrass bed in Shatin, Tai Po and Plover Cove have been destroyed due to reclamation and reservoir construction (Fong 1999).

Seagrasses are a relatively hardy group of plants, but they are damaged by unfavourable conditions such as excessive siltation, turbidity, water pollution, bottom trawls, which scrape and plough the meadows, and marine excavation and filling. Some pollutants in seawater are toxic to seagrasses. Other major threats are dredging and filling operations in seagrass meadows.

The disappearance of seagrass communities may go unnoticed because, unlike mangroves and coral reefs, seagrass communities are not visually obvious to most observers (Clark 1992).

**Lagoons and Estuaries**

Lagoons and estuaries have sustained human settlements dating back to prehistoric periods. In addition to shipping, these coastal water bodies at the present time serve a multitude of purpose including waste disposal, mariculture, recreation, and residential development. Some large lagoons have been drained and/or filled to create real estate or agricultural land, most notably in land-scarce regions (such as in Japan and in the Netherlands) (Clark 1992).

The intensive use of embayments that serve as ports and harbours creates a variety of environmental impacts and severe losses of estuarine and lagoonal natural resources.

Improperly planned development on the shores of estuaries and lagoons creates a variety of short and long term economic losses and opportunity costs resulting from resource collapse. It should be noted that the same management approach might be effective for solving multiple use problems in larger, more open systems like the Bay of Bengal or Gulf of Thailand (Clark 1992).

A major source of degradation of shallow embayments is their continued use as pollutant discharge areas. Aside from outright fish kills and other dramatic effects, pollution causes pervasive and continuous degradation, evidenced by the gradual disappearance of fish or shellfish, or a general decline in the natural carrying capacity of the system. The most likely sources of pollution are agricultural and industrial chemicals and organic wastes. Such contaminants in high concentrations create a hostile environment that drives away fish, prevent shellfish from reproducing, or undermine the food chain (Clark 1992).

#### **CONFLICT AMONG GOVERNMENTAL AGENCIES AND SECTORS**

Ministries and government agencies are the group most concerned with co-ordination and collaboration. Potential conflict can arise in cases where jurisdictions overlap or are not clearly defined. In the fishery sector, for instance, these not only include the ministry (or department) of fisheries, but also those of agriculture, forestry, tourism, merchant marine and many others. Such conflicts can also arise between sectoral ministries as well as between central and local governmental agencies, within sector (Fig. 3.3 and Box 3.2), for example between artisanal and commercial fisheries, between commercial fishers when different groups use incompatible gear, or when commercial and recreational fishers interests diverge. Capture fishermen and fish farmers may also come into conflict over site location or for other reasons.

Government agencies may conflict with one another (Fig. 1) for a variety of reasons. They may have different legal mandates and agency missions; they may have different agency styles and personnel with different training and outlooks; they may respond to different external constituencies who may demand opposing actions; or there may be a lack of information and communication among them (Cicin-Sain and Knecht 1998). Another type of conflict, (Wehr 1979 cited in Cicin-Sain and Knecht 1998) in the coastal setting may often go through a series of stages. First, a precipitating event signals the emergence of a dispute. Specific issues may then be transformed into multiple issues or a generalised feud and the parties may become polarised. Finally, 'spiraling' may occur as the conflict escalates and stereotyping and 'mirror-imaging' takes place ('opponents come to perceive one another as the mirror opposite of their own exemplary characteristics').

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