1995

Impacts of mangrove conversion

Aquaculture Department, Southeast Asian Fisheries Development Center

Southeast Asian Fisheries Development Center, Aquaculture Department (1995). Impacts of mangrove conversion. Aqua Farm News, 13(4), 14-15.

http://hdl.handle.net/10862/2474

Impact of mangrove conversion

The mangrove forest contributes to both terrestrial and aquatic productivity, especially on the detritic energy pathway through leaf litter. Many productive fishing grounds are found adjacent to mangrove areas which has numerous ecological functions and are seriously affected when denudation takes place.

Impact on fisheries. The mangrove areas which serve as nursery grounds for important species of fish and crustaceans are also rich feeding ground for many species from various trophic levels. An analysis of the 1981 landings in Malaysia shows that 32% may be associated with mangroves while in the Philippines, 71.9% of the total catch from 1982 to 1986 has some close association with mangroves.

Mangal (mangrove forest) mollusks and some species of oysters and cockles are associated with mangroves. Several species of shrimp, notably penaeids, also depend on mangroves from their larval to juvenile stages. Like crustaceans and mollusks, many species of fish are closely associated with mangroves but very few species are truly mangal residents. Numerous studies have been conducted on the fish composition of mangrove areas worldwide. In Florida, USA, about 80% of the marine commercial and recreational catch are dependent on mangroves for at least some critical stages of the species life cycles. In Fiji, 60% of commercial landings are from mangrove areas.

In the ASEAN region, the impact of mangrove conversion on fisheries has not been assessed qualitatively and quantitatively. However, many aquaculture operations rely on the collection of naturally occurring seed stock of penaeid shrimp and fish like milkfish, groupers, snappers and sea bass. Although the commercial hatchery production of penaeid shrimp and sea bass has been attained, many hatcheries still depend on their wild broodstock. Thus, the destruction of mangroves could affect the availability of fry and broodstock and, consequently, aquaculture production and capture fisheries. Low recruitment will consequently affect production. With many overexploited fishing grounds in the region, the loss of habitat through mangrove destruction will further compound stock recruitment and production.

Economic impact will most likely be localized. The decrease or subsequent depletion of seed stock of penaeid shrimp and milkfish can displace fishermen and fry gatherers who depend on the fisheries for sustenance. Mollusk culture beds will also be directly and indirectly affected. The decrease in aquatic productivity as a result of mangrove destruction directly affects the settling and growth of mollusks like oysters and cockles. Indirectly, it affects the

A former mangrove area converted into fishpond in Barotac Nuevo, Iloilo Phil.

The destruction of mangroves accelerates the erosion of riverbanks especially where water traffic is heavy.

culture beds through high sedimentation resulting from shoreline erosion and terrestrial runoff since there will be no barriers against these forces.

Shrimp catch, especially the penaeid species, has been correlated significantly with existing mangrove areas.

The evaluation of mangroves is very difficult because many goods and services derived from the mangrove ecosystem are not easily monetized and are considered economic externalities. Financial analysis of mangrove conversion considers only its profitability from the investor's point of view. The social benefits are almost always ignored and that many mangrove areas in the region are privately owned. Many of the coastal communities dependent on coastal resources tend to be politically and economically marginal.

Shrimp farming has dramatically increased since the 1970s because of the high profitability of such a venture although few people or groups of people benefit from it.

Impact on coastal areas. The impact of mangrove conversion on coastal areas varies from place to place, depending on the prevailing local conditions. In typhoon-prone areas, the destruction of mangroves increased the risk of coastal erosion from storm surges and winds. Along estuarine systems, their denudation accelerates the erosion of riverbanks, especially where water traffic is heavy. When large areas of mangroves have been converted to shrimp ponds, the process results in the following: acid sulfate soils are exposed, leading to poor production and mass mortality of stocks as well as the discharge of toxic substances into nearby waters.

The destruction of mangroves for coastal development (i.e., residential and industrial sites), will affect the freshwater supply through salt intrusion upstream, particularly under low-rainfall conditions; on the other hand, flooding will occur under high-rainfall conditions. In Jakarta, the construction of *tambak* resulted in the diversion of stream channels, causing major channels in hydrologic regime and siltation, thereby altering the coastal sedimentation process. Conversion to salt ponds also alters soil structure and increases salt content, thereby rendering the area difficult to reclaim, especially for agriculture or silviculture. Some *Artemia* ponds in Thailand and the numerous salt ponds in the region can become unproductive should these areas be abandoned for various reasons. Conversion of mangroves to mining areas — as in Indonesia and Thailand — not only affects other resources (i.e., coral reefs, coastal waters, beaches, fisheries) but could also render the areas irreversibly damaged, if not costly to reclaim for more productive purposes.

Source: Paw JN. and Chua TE. 1991. An assessmentof the ecological and economic impact of mangrove conversion in Southeast Asia. p. 201-202. In: LM Chou et al (eds.). Towards an integrated management of tropical coastal resources. ICLARM Conf. Proc. 22. 455.p.