TANGIBLE PRODUCTS OF MANGROVE

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Introduction

Over the past decades, we have witnessed impressive socio-economic development in mangrove area. Mangroves are considered an important resource for socio-economic development, mitigation and adaptation to climate change. The importance of mangrove forests in nation development is very relevant since it provides natural resources to the local communities in the surrounding areas. Mangrove forests are important ecosystems, especially for communities living in coastal areas. Mangrove forests can provide a wide range of wood and non-wood forest products. Mangroves provide both tangible and intangible benefits. In many countries, local communities rely on mangrove forest products to meet their subsistence needs for fuel and construction. Human uses of mangrove resources have been categorised into traditional, commercial and destructive uses. Mangroves are a good source of wood and timber,firewood and charcoal, poles. Mangroves are also a habitat for fishes and crustaceans; and also for aquaculture and commercial fisheries.

The mangrove ecosystem has important direct and indirect economic, ecological and social values to human. These ecosystem services provided by mangrove include provisioning (such as timber, fish), regulating (such as carbon sequestration coastal protection), supporting (such as maintenance of nutrients and genetic resource conservation) and cultural (such as ecotourism and landscape beauties). The estimated economic values and other indirect benefits of a given mangrove forest area can play an important role for the socio-economic development of a state or country. These benefits of conserving of mangrove forests are accrued to different social groups.

Mangrove Products

Aksornkoae et al (1993) asserted that the tangible benefits of mangroves comprise timber and non-timber products. For instance, Rhizophora sp. trees are harvested for poles, firewood and charcoal production. Mangrove wood is also used for construction of houses and fish traps. Fronds of Nypa fruticans are particularly valued in Southeast Asia for use as thatch for roofing. On the other hand, the linkage between mangroves and associated fisheries is well recognized, functioning as nesting ground for crabs, mollusks, fishes, and all sorts of aquatic life.

Macintosh (1996) added that the intangible benefits include ecological and social functions such as coastal protection against wave and current abrasion, shelter and habitat for wildlife and ecotourism. Mangrove proven important to address poverty eradication and to provide better livelihood for the rural population, such as the coastal communities. Most of the people living in or adjacent to mangrove areas derive their livelihood from forestry and fisheries. Previous research has shown that local communities from the mangrove area benefit directly from the mangrove forests through the utilization of forestry and fishery products.

As mentioned, mangroves provide enormous benefits, i.e., tangible and non-tangible to the local communities. Tangible benefits of mangroves comprise timber and non-timber products and other livelihood support systems provided. On the other hand, non-tangible benefits include ecological functions including coastal protection, habitat for wildlife and fish and carbon sequestration. Table 1 shows the uses and functions of mangroves. Studies found that the community's dependence on the mangroves is very high. These include the extraction of mangroves for leaves/fodder and fuel wood. Fishermen are one of the important benefactors of mangroves. It also validates the claim that mangroves help fishermen to increase their fish catch. This is in-line with scholars who espouse that mangrove ecosystems act as a habitat for various marine creatures, especially fish.

Table 1: Different Uses and Functions of Mangroves

Mangrove Uses	Mangrove Functions
A. Sustainable Production Uses	B. Regulatory or carrier functions
Timber; Firewood; Woodchips; Charcoal Fish, Crustaceans; Shellfish; Tannins; Nipa; Medicine; Honey; Traditional hunting; fishing and gathering; Genetic resources.	Erosion prevention (shoreline and riverbanks); Storage and recycling of human waste and pollutants; Maintenance of biodiversity; Provision of migration habitat; Provision of nursery grounds, Nutrient Supply. Nutrient regeneration; Coral reef maintenance and protection; Habitat for indigenous people; Recreation sites.
C. Conversion Uses	D. Information Functions
Industrial / urban land use; Aquaculture; Salt ponds; Rice fields; Plantations; Mining; Dam sites	Spiritual and religious information; Cultural and artistic inspiration; Educational, historical and scientific information; Potential information.

Source: Adapted from Doherty (2004)

Spalding (2004) asserts that the socio-economic values of mangrove have been well documented. It is found that most of the people living in mangrove areas derive their livelihood from forestry and fisheries. Rasolofo (1997) added those mangroves are valuable sources of fuel wood, fodder, timber, tannin and other natural products for local people. Timber from mangrove forest is primarily used for charcoal. The next important product is poles for construction which is derived from intermediate felling. Poles of Rhizophora is important for piling material by the local housing and road construction. Fishermen also used poles as stakes for wood vinegar, briquettes, charcoal chips which include fire igniters, fertilisers, water filters and air purifiers. Apart from charcoal and pole production, mangrove forest ecosystems form complex and productive habitats for many marine species too, providing shelter for crucial spawning, feeding and nursery grounds. Another benefit of mangrove ecosystem is aquaculture. Mangrove ecosystems are widely recognized as providers of a great variety of goods and services to people, providing optimal breeding, feeding and nursery grounds for many fish and shellfish species (Macnae, 1974).


Figure 1: Charcoal


Figure 2: Harvested poles


Figure 3: Net cages set up for aquaculture

Conclusion

Mangrove forests provide important tangible and intangible benefits to local communities in the form of socio-economic development opportunities such as fishing, aquaculture, ecotourism, fuel-wood collection, biodiversity conservation, carbon sequestration and shoreline stabilisation.

Mangrove areas are frequently threatened by urbanization and industrialization. The option of conserving and preserving the mangrove area is rarely a priority since policy makers neglect the full benefits of wetlands due to market failure. Therefore, pristine ecosystems needs to be sustainably managed to provide resources and benefits (i.e., tangible and intangible) to the environment and also to support the livelihoods of local communities living adjacent to the mangrove area.

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