Seaweed farming and artisanal fisheries in an Indonesian Seagrass bed: complementary or competitive usages?

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Since the 1980’s, open water seaweed farming has been established in many coastal communities in Indonesia. It is mostly restricted to shallow waters and their natural ecosystems, e.g. seagrass beds. They themselves are important habitats for many species of fish, shrimp and crab which are the basis for traditional fisheries. Therefore, if seaweed farming causes the seagrass ecosystem to change, its economical benefits might be outbalanced by losses in the artisanal fisheries sector. The field research for a PhD study included investigations of a) the economic importance of seaweed farming, b) the influence of seaweed farming on seagrass flora, c) the economic importance of artisanal fishery’s practices and implications for management, and d) the variation in fish stock and gill net fishery in the seagrass bed of Puntondo, a small village at Laikang Bay, South Sulawesi, Indonesia.

Potential for environmentally sustainable development of seaweed farming and fisheries

Seaweed farming is an important economical factor in Puntondo. Based on experimental data, the threshold level for a sustainable algae density was estimated to be $\approx 220,000$ seedlings $\text{ha}^{-1}$. A calculation with data from seaweed farms resulted in a slightly lower level. The current farming scheme (off-bottom method, rotating farming plots, algae density approx. $110,000 \text{ha}^{-1}$) in the village does not directly interfere with the seagrasses below and is environmentally sustainable. However, efforts to increase production should focus on alternative farming methods and areas and on improving post-harvest processing. Catches with gill nets indicated that the seagrass bed experienced periodic migrations into it. Fisheries in the seagrass however, did not contribute significantly to the income from this sector, and the most important fish families do not directly depend on seagrass habitats. Minor changes in seagrass vegetation are therefore not expected to influence fisheries. Some fishing methods proved to be very unsustainable and all fishing grounds were over fished. Regulation of those methods and seasonal closure of habitats seems inevitable to sustain and develop artisanal fisheries in the area.

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