

A Review on Development of Aquaculture in Cambodia

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ABSTRACT

Aquaculture in Cambodia is gaining popularity due to growing anthropogenic pressures. Policy discourse is promoting its development as a viable alternative to fisheries. The Ministry of Agriculture, Forestry and Fisheries reports that aquaculture contributes to the daily livelihoods of rural poor farmers and employment. Fish is a significant source of animal protein, and aquaculture-based fisheries offer enormous potential for fish culture production. NGOs and other organizations are playing a significant role in developing aquaculture and managing aquatic resources in Cambodia. This study is to review on the development of aquaculture sector in Cambodia. The result showed that fish is the most important source of animal protein in Cambodian people's daily diet. There is enormous potential in fish culture production from floating cage culture, earthen pond culture and rice-fish culture and other fish culture activities in small water bodies or aquaculture-based fisheries in Cambodia. Moreover, fish does not only play a major role in the daily diet, but also in the employment, economy of the rural poor farmer and improvement of women role in aquaculture

INTRODUCTION

Cambodia has one of the world's most productive inland fisheries (Baran, 2005), based around the ecosystem of the Tonle Sap Lake. Inland fisheries have been central to livelihoods and food and nutrition security in Cambodia for centuries (Cooke, 2011; Sithirith, 2011), and continue to be so today (Hartje et al., 2018; Freed et al., 2020). The Mekong River is one of the world's largest rivers, characterized by its high levels of fish biodiversity. The river contributes to food security in many of the developing countries it runs through, and there is little doubt that the construction of new dams will substantially impact the river's fish population and fisheries (Ferguson et al. 2011). Aquaculture has only relatively recently become the focus of sustained interest from research and development institutions in Cambodia. This interest aligns with predicted, and increasingly realized, declines in inland capture fisheries production. For example, a combination of drought and water impoundment by upstream dams caused reported fish catch from the Tonle Sap to contract 23% in 2020, prompting fears of imminent fisheries collapse (MRC, 2020). Such a collapse would threaten the livelihoods and food security of millions of Cambodians (IFReDI, 2013). Aquaculture is increasingly framed in Cambodian development policy discourse as having an important role to play in meeting demand for fish and providing rural employment, but has yet to contribute significantly to these outcomes. Development projects supporting Cambodia's aquaculture sector have faced constraints to sustainable impact, and high rates of non-adoption (JICA, 2015; Richardson and Suvedi, 2018). This study wants to know about the evolution of aquaculture in Cambodia. The fisheries sector plays a vital function in Cambodia's food supply, particularly the poor. It is also important for Cambodia's national economy that most national incomes come from this sector through exploitation and exportation. According to the latest official data recorded by the Department of Fisheries (DoF), the total commercial fisheries production in 2002 was 424,400 metric tons, which included the small scale and family scale freshwater fisheries and aquaculture production, except crocodile culture (DoF, 2003). Shrimp farming in Cambodia began in 1989 and has significantly expanded since 1991. The shrimp farming activity has been carried out along the coastline of Cambodia, i.e. in the four coastal provinces namely Kampot, Kep, Preah Sihanouk Ville, and Koh Kong. Two main species of penaeid shrimps have been popularly cultured, i.e. black tiger shrimp (*Penaeus monodon*) and whiteleg shrimp (*P. vannamei*). Moreover, two types of culture system, i.e. extensive and intensive, have been practiced in these farms over the past several years (Hav and Leap, 2005).

LITERATURE REVIEW

Report the Ministry of Agriculture, Forestry and Fisheries talked about Fishing business, Aquaculture, Fishery processing, Inspection and Suppression of Fisheries Crimes and Fishery exports (MAFF, 2019).

Freshwater Prawn and Shrimp Farming

Traditional extensive shrimp farming is practiced on a small scale in Kampot Province. This relies mainly on natural seed and feed, and productivity is less than 100 kg/ha/year. More intensive shrimp farming began in the 1990s and its production rose to a peak of over 700 tons/year in 1995. Tiger shrimp *Penaeus monodon* and banana shrimp *Penaeus merguensis* were the main cultured species. Unfortunately, shrimp farming suffered from serious disease and collapsed. Production has been less than 100 tons in recent years (Lang, Ouch,2015).

Aquaculture Product

Aquaculture in Cambodia has undoubtedly grown in recent years – from less than 14,600 tons in 2002 to 74,000 tons in 2012. The production trends for total aquaculture production are shown in Figure 3. In the last ten years, the contribution of aquaculture activities to total fisheries production has been increasing dramatically. Aquaculture development has become a “national moment”, as noted in the speech of the Cambodian Prime Minister in 2008 (Lang, Ouch,2015).

METHODOLOGY

This review uses the report analysis to answer .to collect data from another document of the journal that was published, the website, the book, The data is derived from journal articles and document from Ministry of Agriculture, Forestry and Fisheries, in Cambodia combined it on the desk and analyzed it by using secondary data.

RESULT AND DISCUSSION

Constraints in Aquaculture Development

In general, aquaculture activities in Cambodia are mainly on small-scale operations targeting the improvement of nutrition of local people. During the process of fish culture, some constraints were usually reported such as lack of technical assistance, lack of water supply, lack of seed and feed supply, and limited awareness of fish culture technologies among fish farmers. The following key issues are commonly noted in Cambodian aquaculture:

Problems in Cage Culture

High mortality rates of fishes during summer months, particularly from March-May when the water temperature is high and the water flow is reduced, Large amount of waste being discharged, causing deterioration of water quality, The seed used for cage culture are collected from the wild and may have significant impact on wild stock ,For Pangasids and other species, the sharp decline of wild seed supply led to shortage of seed for stocking, while hatchery-produced seed have not been available There is heavy reliance on catching or buying low-value fish/trash fish for feed(Lang, Ouch,2015).

Problems in Shrimp Culture

Unavailability of hatchery-produced shrimp post-larvae, Reliance on imported post-larvae from neighboring countries, Diseases, Lack of special extension programs focusing on shrimp farming.

Inadequate water supply is a serious constraint since most pond water is stagnant, fish kills occur during the summer season, unavailable hatchery-produced seed of high-value culture species. poor knowledge of farmers about feeds and feeding technology, imported commercial feeds (pellet feed) are expensive There is a heavy reliance on catching or buying trash fish for feed Aquaculture cooperative or society does not function well resulting in a lack of communication to exchange ideas or techniques.

Marine Aquaculture

Mariculture is less developed as compared to the neighboring countries, common cultured species: groupers and snappers (wild seed and imported), In 2011, there were about 800 cages. Reliance on wild seed and imports. Unavailability of hatchery-produced seed. Unavailability of commercial feeds. Lack of training and extension programs focusing on marine aquaculture, investment for marine aquaculture is quite high (i.e. cage construction, feed cost)

Opportunity for Aquaculture Development

The main points of opportunities for aquaculture development in Cambodia are as follows: form of more than 500 freshwater species and a similar number in marine species in the MRC research/breeding programme. Many potential aquaculture species have high nutritional value. Many indigenous species have higher price than mainstream aquaculture species. Region-wide there is an excellent range of high-quality breeds of exotic species in public and private sector. A wide range of species is suitable for marine and brackishwater aquaculture: filter-feeding shellfish; marine finfish, seaweed. There are also opportunities for the production of tilapia and catfish in brackishwater. At least 10 species grow well in rice fields and are easy to sell production and consumption of even a small quantity of fish can generate significant benefits and income to the rural poor people in society. Small-scale fish farmer can reduce costs of inputs, increase price of product, exchange knowledge and experience, and reduce share risk by forming cooperatives, associations and networks. small-scale hatchery or nursery production can generate substantial revenue from modest land/water resources – far higher than from rice production.

Successful small-scale fish farmer can expand to medium-scale and large-scale, and land can also be rented. Aquaculture enterprises at all scales can generate employment for both men and women. efficient industrial scale production of easily grown species typically results in widely available low-cost fish, which will benefit the poor, especially in urban areas, etc.

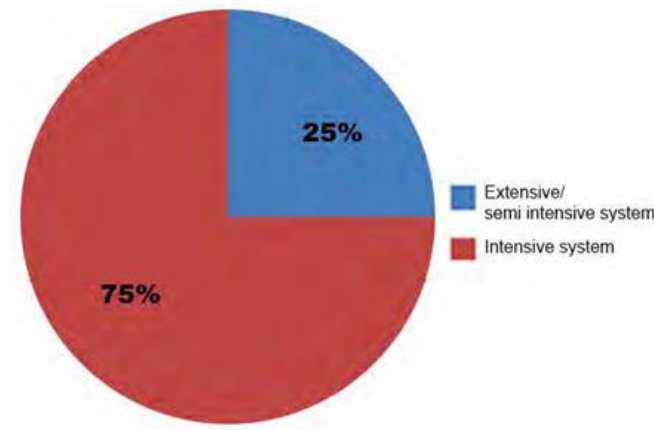


Figure 1. Fish Production in Pond Culture Systems
(Source: Aquaculture Development Department)

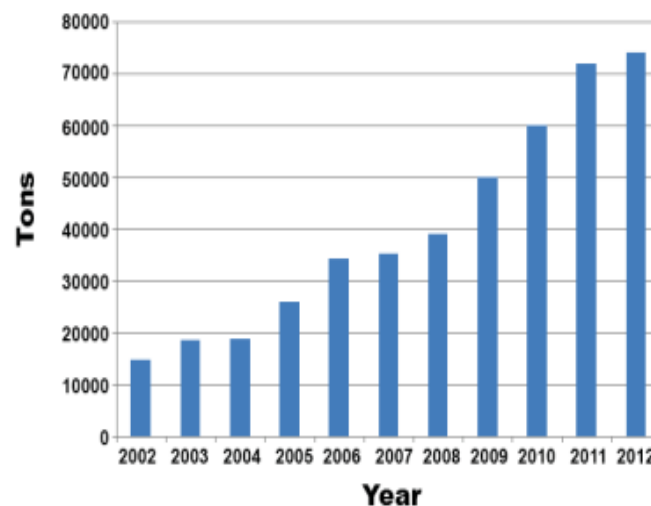


Figure 2. Aquaculture Production in Cambodia in 2002-2012

CONCLUSIONS AND RECOMMENDATIONS

Aquaculture in Cambodia plays an important role in contributing to the improvement of the daily livelihood of the rural poor farmer community. Fish is the most important source of animal protein in Cambodian people's daily diet. There is enormous potential in fish culture production from floating cage culture, earthen pond culture and rice-fish culture and other fish culture activities in small water bodies or aquaculture-based fisheries in Cambodia. Moreover, fish does not only play a major role in the daily diet, but also in the employment, economy of the rural poor farmer and improvement of women role in aquaculture. Recognizing the potential role of aquaculture in subsistence farming, NGOs and other IOs have been contributing a significant role towards the development of aquaculture and in the management of aquatic resources in Cambodia. The FiA has been taking a number of steps to promote aquaculture in all potential areas in partnership with various NGOs, IOs and other agencies involved with rural development projects.

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