

Highlighting the Importance of Inland Capture Fisheries in the Southeast Asian Region

Dina Muthmainnah, Safran Makmur, Sevi Sawestri, Aroef Hukmanan Rais, Siswanta Kaban, Freddy Supriyadi, Khairul Fatah, and Satoshi Honda

The Southeast Asian region is endowed with enormous areas of natural inland water resources, such as river systems, lakes, floodplains, reservoirs, dams, and wetlands, as well as a rich diversity of aquatic species. Fishing activities in these inland waters have long been practiced by rural people whose subsistence depends on the inland waters and products. These inland resources have continued to provide them food security through enhanced livelihood and improved incomes for their households. However, the sustainable development and utilization of these inland resources is crucial to sustain the socio-economic well-being of the rural folks. It was towards attaining this objective, among others, that the Inland Fishery Resources Development and Management Department (IFRDMD) of SEAFDEC was established in 2014. Specifically, IFRDMD is mandated to conduct and facilitate research projects on the sustainable development and management of inland fisheries in the Southeast Asian region.

inland water bodies, followed by Myanmar with more than 82 million ha, Thailand with more than 66 million ha, and the Philippines with more than 12 million ha. Cambodia has the Tonle Sap Great Lake which could expand from 250,000 ha to more than 1.6 million ha during the wet season (Pongsri *et al.*, 2015). **Fig. 1** shows the important rivers and lakes in the region that have been tapped by rural fisherfolks for many years for their subsistence.

The inland bodies of water in the region are inhabited by a rich diversity of aquatic species including an estimated 1,700 species of freshwater fish (Nam *et al.*, 2009). There are more than 500 species in the Mekong Basin (Zakaria-Ismail, 1994), 290 species in the Kapuas River in Indonesia, 147 species in the Mahakam River in Indonesia, 115 species in the Baram River in Malaysia (Dudgeon, 2000), and 233 in Musi River in Indonesia (Husnah *et al.*, 2008).

Inland Fisheries in the Southeast Asian Region

The natural inland waters of Southeast include vast river systems and lakes, floodplains, reservoirs, dams, and wetlands. Specifically, Indonesia has more than 256 million ha of

Inland fisheries have long been a vital component of economic security in sustaining and alleviating the poor and disadvantaged communities around the world whose subsistence depends on wetland and inland products. Fisheries in inland waters provide food security, livelihood, cultural and religious identity, recreation, and serve as a source of income for millions of people globally (Welcomme *et al.*,

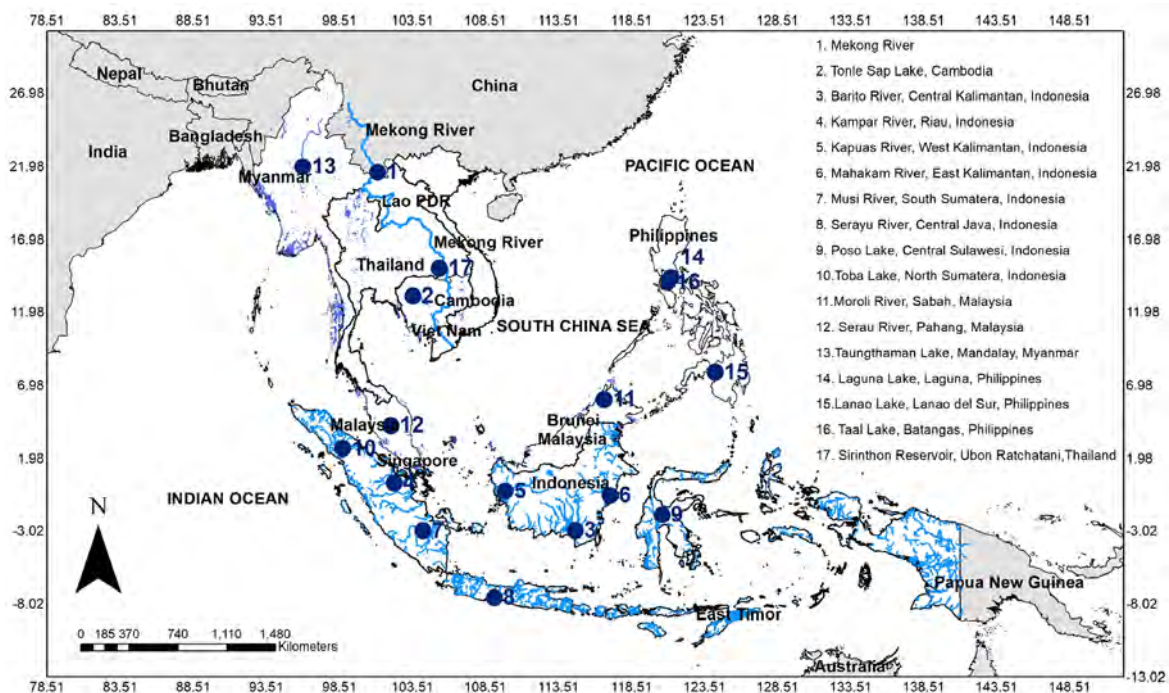


Fig. 1. Important rivers and lakes in Southeast Asia

Table 1. Production from inland capture fisheries of the Southeast Asian countries by quantity (MT) in 2014

Country	Inland capture fisheries production (MT)	Total capture fisheries production (MT)	% of inland capture fisheries production to total capture fisheries production	Total fisheries production (MT)	% of inland capture fisheries production to total fisheries production
Brunei Darussalam	-	3,186	-	3,947	-
Cambodia	505,005	625,255	80.77	745,310	67.76
Indonesia	446,509	6,413,648	6.96	20,600,772	2.17
Lao PDR	60,237	60,237	100	150,592	40
Malaysia	5,611	1,463,737	0.38	1,988,302	0.28
Myanmar	1,381,030	4,083,270	33.82	5,040,311	27.4
Philippines	211,941	2,343,813	9.04	4,681,418	4.53
Singapore	-	1,433	-	6,695	-
Thailand	209,800	1,769,546	11.86	2,667,309	7.87
Viet Nam	208,100	2,919,200	7.13	6,332,500	3.29
Total	3,028,233	19,683,325	15.38	42,217,156	7.17

Source: SEAFDEC (2018)

2010; Lynch *et al.*, 2016). Nevertheless, inland water areas are influenced by permanent, seasonal, or intermittent occurrence of flooded conditions. During the wet season, the lowland swamps become a productive fishing ground (Muthmainnah and Gaffar, 2010) where inland capture fisheries and related activities could harvest high volumes of fish. Fishing activities in these areas usually start during the beginning of the rainy season when fish migrate from the main river either for feeding or spawning and finish during the middle of dry season when the fish are going back to the main river.



As shown in the fisheries statistical data on inland capture fisheries, the region's total production from inland capture fisheries in 2014 (**Table 1**) was 3,028,233 metric tons (MT), accounting for approximately 15% of the region's total capture fisheries production or 7% of the region's total fisheries production. The top producer, Myanmar accounted for 33.8% of the country's total production from capture fisheries, 27.3% of the country's total fisheries production, and 3.3% of the region's total fisheries production. As the second highest producer, Cambodia reported production volume of 505,005 MT that represented 80.8% of the country's production from capture fisheries, 67.7% of the country's total fisheries production, and 1.2% of the region's total fisheries production.

It should be noted however, that the abovementioned information could be under reported due to the inadequacy of information gathered on inland capture fisheries. An ongoing regional effort has been underway to improve the compilation of fisheries data from inland capture fisheries of Southeast Asia. This could lead to the establishment of the real situation of the inland capture fisheries in the region.

Meanwhile, IFRDMD has been promoting and raising awareness on the sustainable management of inland fisheries in Southeast Asia through the five-year project "Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia (2015-2019)." The specific objectives of the project are to: 1) review the activities and methodologies on promoting inland fisheries in the ASEAN Member States (AMSs); 2) promote effective inland fisheries management measures in the AMSs; and 3) to study and develop habitat conservation/resources enhancement measures suitable for the region.

As one of the activities of the project, the workshop "Review of Activities and Methodologies for Promotion on Inland Fisheries" was organized by IFRDMD in August 2016 in Palembang, Indonesia. Attended by representatives from

Table 2. Some aspects of inland fisheries in the Southeast Asian countries

Country	Data collection system			Members of Fisheries Management Committee	Side jobs of fishers
	Start	Interval	Responsible agency		
Cambodia	1983	monthly	National government and MRC	Fishers	Farming, small-business ventures
Indonesia	1974	yearly	National and local government	Government, fishers, NGO	Rice and non-rice farming, fish culture, cattle farming, rubber/palm plantation, non-timber forest product collection, horticulture
Lao PDR	2003	yearly	National government	Government, fishers, NGO	Rice cultivation, gardening
Malaysia	1985	yearly	National government	Fishers	Farming, rubber tapping, gardening
Myanmar	N.A.	yearly	Local government	NGO	Agriculture
Philippines	1960	yearly	National government	Fishers	Farming, livestock raising, peddling goods, caretaking, construction works
Thailand	1969	yearly	National government	Fishers, government, lecturers	Farming, contract services
Viet Nam	1946	monthly	National government	Fishers committee	Cultivating, animal husbandry, small business

Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, and Viet Nam, the workshop was also attended by scientists from the Mekong River Commission (MRC), Japan International Research Centre for Agricultural Sciences (JIRCAS), Ubon Ratchathani University (UBP) of Thailand, Bogor Agricultural University (IPB) of Indonesia as well as officers and staff of the SEAFDEC Secretariat and Training Department. The workshop discussed the current status of inland fisheries in the Southeast Asian region as well as established the precise methods of collecting data on inland fisheries, particularly on catch statistics, fishing gears, management measures, and the livelihood opportunities in inland fisheries.

From 2015 to 2017, IFRDMDs conducted surveys in the Southeast Asian countries to compile the basic information on inland capture fisheries (Table 2). The results indicated that the Philippines and Thailand started collecting data as early as 1960s, while Lao PDR started in 2003. All countries update their inland fisheries data annually, except for Cambodia which is done monthly. While the local government of Myanmar is responsible for data collection on inland fisheries, it is the national government for the rest of the Southeast Asian countries. The findings also indicate that since inland capture fisheries is seasonal, most inland fishers are involved in several side-jobs to augment their incomes.

Issues and Constraints in Inland Fisheries in Southeast Asia

Inland water resources are being degraded and many are almost lost, mainly as a result of destructive human activities.

Changes on the aquatic environment brought about by fishing and non-fishing activities disrupt the sustainability of the inland water resources. Destructive fishing practices such as using poisonous substances and electric shock damage the whole fish communities while inadequate management of aquaculture negatively impacts on the water quality. Modification of water bodies (damming or dredging) destroys the spawning ground, changes the fish migration pattern, and harms fish feed organisms. Competition on the utilization of the freshwater resources among several sectors (*e.g.* development projects) also damages the aquatic ecosystem.

Furthermore, the real situation of inland fisheries in the Southeast Asian region could not be established in view of the various issues and constraints confronting the compilation of data that include: 1) inadequacy of data on inland fisheries production; 2) ineffectiveness of the methodologies used in data collection; 3) varying data collection and reporting systems among the countries; and 4) shortage of human and institutional resources. Reliable and comprehensive data are important to guide the policymakers and the stakeholders in the management of inland fisheries. However, inland capture fisheries comprise a large number of subsistent fishers who are mostly engaged in part-time fishing activities, with their catch going to various channels, *i.e.* used for household consumption, sold in local markets, or exported to markets within the region. Also, the resources could be freely accessed, and the production is multispecies which could be landed anywhere without proper recording. In the midst of these constraints, the data are fragmented and discontinuous, making the collection of catch statistics difficult to undertake.

Recommendations and Way Forward

The primary purpose of fisheries management is to establish the appropriate system management rules based on defined objectives, and a mix of management means to implement regulations, which are put in place by a system of monitoring, control, and surveillance (Wilson *et al.*, 2003). To sustain the inland fishery resources, there is a need to develop an integrated management that involves stakeholders in making management decisions. Prior to that, studies on co-management and rights-based fisheries management applicable to inland fisheries in the region are important to reach and share the common understanding on the issues and problems on the implementation process. Appropriate management measures could include fish catch size limitation, regulations on fishing gears, open/close fishing season, establishment of conservation zones, and studies on the biology of the target species as well as capacity building for the people who involved in handling these issues.

Concerns on the sustainable development and management of inland fisheries could also be addressed if the real-time basic information on the fisheries inland water bodies is in place. It is towards this end that the project being carried out by IFRDMD is targeting. Moreover, intensive information sharing and workshops among AMSs are essential to promote effective inland fisheries co-management system in the region. This is being promoted by IFRDMD through its planned activities that include a workshop to develop guidelines for effective inland fisheries management in the region to be participated by representatives from the AMSs. The workshop would also aim to formulate appropriate management measures on inland fisheries applicable to each area and country, after which the fisheries departments of respective countries will be consulted to assess the feasibility of such management measures.

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About the Authors

Dr. Dina Muthmainnah is a Researcher at SEAFDEC/IFRDMD and at the Research Institute for Inland Fisheries and Extension of the Ministry of Marine Affairs and Fisheries in Palembang, Indonesia. She is the Leader of the project "Promotion of responsible utilization of inland fisheries in Southeast Asia" for 2017 and 2018.

Dr. Safran Makmur is a Researcher at SEAFDEC/IFRDMD and at the Research Institute for Inland Fisheries and Extension in Palembang, Indonesia. He was the Leader of the project "Promotion of responsible utilization of inland fisheries in Southeast Asia" for 2015.

Ms. Sevi Sawestri is a Researcher at SEAFDEC/IFRDMD and at the Research Institute for Inland Fisheries and Extension in Palembang, Indonesia. She was the Leader for the research activity "Promotion of responsible utilization of inland fisheries in Southeast Asia" for 2016.

Mr. Aroef Hukmanan Rais, Mr. Siswanta Kaban, Mr. Freddy Supriyadi, and Mr. Khairul Fatah are Researchers at SEAFDEC/IFRDMD and at the Research Institute for Inland Fisheries and Extension of the Ministry of Marine Affairs and Fisheries in Palembang, Indonesia.

Dr. Satoshi Honda was the Deputy Chief of SEAFDEC/IFRDMD from January 2015 to September 2017. He is now affiliated with Fisheries Agency of the Ministry of Agriculture, Forestry and Fisheries, Japan.