

# Enhancing Fisheries Community Resilience for Sustainable Livelihood and Coastal Resources Management

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Enhancing coastal community resilience for the promotion of sustainable livelihoods and coastal resources management involves various cross cutting issues, and requires strong commitment from and coordination of the national government, organizations and local institutions. The Islamic Development Bank (IDB) provided funds to SEAFDEC for the implementation of the Project “Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management” through a Technical Assistance Grant Agreement with SEAFDEC/MFRDMD as the Lead Department. With the main objective of improving the socio-economic status of coastal communities including the community fisheries organizations through capacity building programs, the Project had as target beneficiaries the coastal Muslim communities in the IDB countries in Southeast Asia, namely: Brunei Darussalam, Indonesia, and Malaysia. This article is based on the output of the Project with special focus on one coastal community in Indonesia, which is the Takalar District of South Sulawesi.

essential identity, structure, and functions (Berkes & Folke, 1998; Leslie & Kinzig, 2009).

The IDB-funded Project “Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management,” implemented through a Technical Assistance Grant Agreement between SEAFDEC and IDB, aims to improve the socio-economic status of the coastal communities including the community fisheries organizations through capacity building programs on fisheries. Implemented in 2016 - 2018, the Project had as its target beneficiaries the coastal Muslim communities in the IDB countries of Southeast Asia, namely: Brunei Darussalam, Indonesia, and Malaysia (Mazalina et al., 2018). Particularly for Indonesia, the pilot site was in Takalar District in South Sulawesi (**Figure 1**), as it reflects a microcosm of the country’s typical coastal fishing communities.

## Takalar District, South Sulawesi, Indonesia

Coastal areas and communities around the world are not only increasingly at risk from both natural and human-induced hazards (Almutairi *et al.*, 2020), such as tsunamis, impacts of climate change, floods, and so on, but are also recognized as most vulnerable places (Cucuzza *et al.*, 2020). In assessing and planning for both social and ecological well-being of the vulnerable communities, community resilience is essentially a first step toward reducing disaster risk in communities and enhancing their resilience to natural and human-induced disasters (Burton, 2015) that would ensure their longevity (Berke & Conroy, 2000). Community resilience is the capacity of a community to adapt to and influence the course of environmental, social, and economic change (U.S. Indian Ocean Tsunami Warning System Program, 2007) without fundamentally altering their

In Indonesian fishing communities, the fluctuation of fishery resources stocks, shifting fishing seasons, and climate change have challenged the coastal communities to respond continuously to such predicaments. Generating coastal livelihoods and improving coastal management are among the approaches that could achieve resilience in fishing communities, especially in the case of Indonesia. The pilot site for this IDB Project implemented in Indonesia was at Takalar District in the South Sulawesi Province, located in the eastern part of the country. Takalar District is located between the Strait of Makassar and Laikang Bay, and includes Laikang Village where most of the respondents of the survey were drawn, considering that most of the seaweed farmers are also from this village.

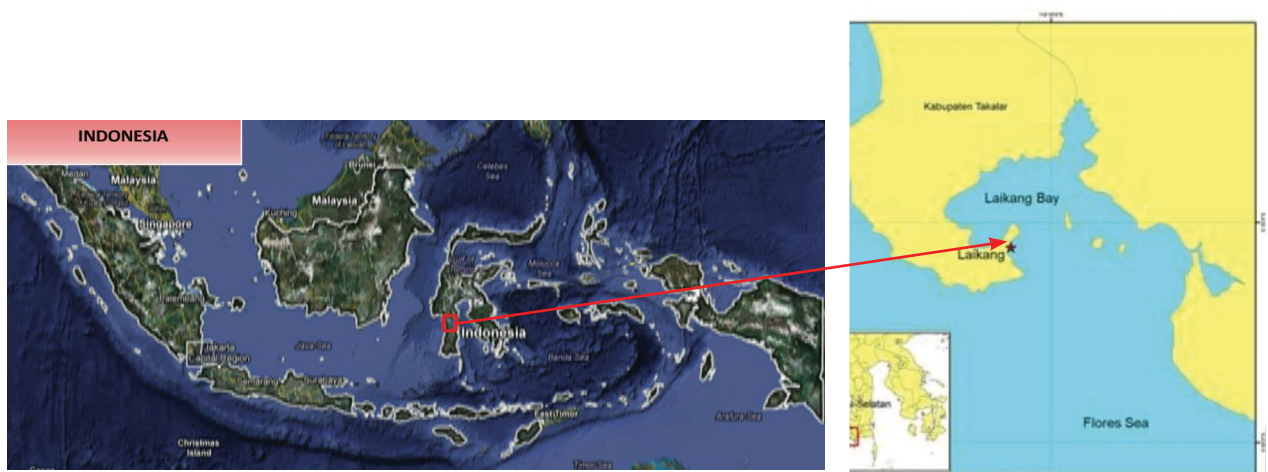


Figure 1. Takalar District, South Sulawesi, Indonesia

South Sulawesi Province has abundant natural resources particularly in Takalar District and the Province itself is the largest producer of seaweeds (wet/dry) in Indonesia. Nevertheless, the increasing intensity of exploitation threatens all efforts toward the conservation of natural resources in that area. The growing dependence of fishing community in Takalar District to seaweed farming as main source of income, had allowed seaweed farming to develop more quickly, potentially resulting to greater prosperity in the coastal areas. However, the density of seaweed plots and unclear separation of farm ownership led to conflicts among interested parties. The issues about foreshore claims should be addressed by the village and government authorities in order to avert any socio-economic crisis to happen in the future. Furthermore, ecological studies should be conducted on the carrying capacity of the coastal environment in Laikang Bay and how seaweed farming has impacted on the environment, in an effort to strike a balance of the social acceptability and positive ecological effects of this particular activity.

## Needs Assessment Survey

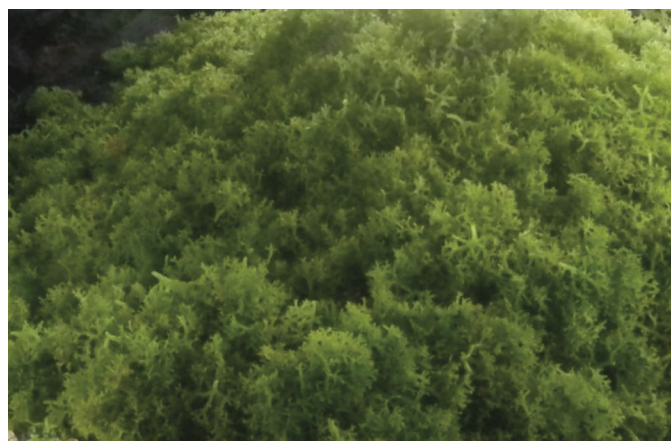
The community questionnaire survey on demographic and capacity building needs of the coastal communities in Takalar District was carried out involving the fishers, seaweed farmers, fishers' spouses, seaweed traders and collectors, seaweed exporters, and seaweed processing companies. Moreover, the staff of the Marine and Fishery Office of South Sulawesi Province, the village head, and selected local Non-governmental Organizations (NGOs) were also interviewed as key informants.



Community survey in Takalar District, South Sulawesi, Indonesia

Results of the survey indicated that the livelihoods of the coastal communities in Takalar District include fishing, aquaculture, and processing of the fishery products, and were supported by the geographical conditions and the availability of natural resources in the area. Geographically, Takalar District is located between the Makassar Strait and the Laikang Bay making the water current in this area relatively calm and allowing marine and brackishwater aquaculture activities to thrive. The commodities cultured by the people of Takalar District include seaweeds, milkfish, crabs, and

tiger prawns. Although some residents culture catfish and tilapia in the inland open waters, but seaweed farming is the predominant livelihood in the community. Specifically, the people from Laikang Village rely on seaweed farming as their main livelihood, and their total production continues to increase, making seaweeds an economically important commodity for South Sulawesi. In 2015, Takalar District contributed 31.80 % of total seaweed production in South Sulawesi and 23.04 % to the national production (personal communication, Department of Marine and Fisheries, 2015).



Seaweeds culture in Laikang Village, Takalar District, South Sulawesi, Indonesia



Training on packaging of seaweed products in Central Lombok

The species of seaweeds being cultured in Takalar District are: *Eucheuma cottonii* and *Eucheuma spinosum* in marine waters; and *Gracilaria* sp. (*sakul*) and *Caulerpa* sp. (*lawi-lawi*) in brackishwaters ponds. Nonetheless, the culture of *Caulerpa* sp. is still limited because it is still a relatively new commodity so the market opportunity is still limited.

Meanwhile, fishing activities are also being carried out in Takalar District, where fishers use boats less than 5 GT and traditional fishing gears such as gillnet and hook and line. Their catch is usually sold fresh for local consumption, and only a small portion is processed. The processed marine and fishery products in Takalar District includes boiled fish, seaweed sticks, seaweed crackers, shredded seaweed, meatballs, dried fish, crab meat, fish balls, fish crackers, and fish cake (*otak-otak*), among others.

### Enhancing Knowledge and Livelihood of Takalar Coastal Communities

Enhancement of community knowledge and institution activity was conducted with the objective of transferring knowledge about the concept and implementation of coastal community development, and strengthening the function and role of local institutions in order to develop the resilience capacities of coastal communities. The activities included: 1) Strengthening



Training on seaweeds product processing (above), shell craft making (right)



coordination with stakeholders, 2) Training on leadership, advocacy and community development, 3) Workshop on Participatory Planning on Resource Management and Conflict Management for Sustainable Livelihood, and 4) Internship and in-house training. Through such activities, a Plan of Action that contains short-, medium- and long-term plans; as well as Marine Fisheries Resource Management Strategies that contain three aspects, *i.e.*, institutional, technical, and adaptive strategies were successfully produced.

Through this IDB Project, internships and training sessions were organized to enhance the knowledge of the community members as well as to provide the means of generating additional sources of income for the community in Takalar District. The list of internship and training sessions conducted are shown in the **Box**.

Another significant output of the Project was the establishment of a Community Center in Laikang Village. Apart from being a center for seaweed collection, the Community Center would also serve as venue for training, processing of fishery products and the production of shell crafts.



Opening of Laikang Village Community Center

### Way Forward

The Strategic Plan of Coastal Resource Management and Community Livelihood of Laikang Village was established for the purpose of promoting sustainable development, environmental management, and ecotourism development. Consisting of short-, medium-, and long-term plans for the development of the coastal community in Laikang Village, this strategic plan is a joint document between Laikang Village community and village policy-makers, and as envisioned, should be realized in the form of activities that support the economic development of Laikang Village. The strategies include, among others, the following:

- Implementation of programs and activities by utilizing existing fund in accordance with financing arrangement of Village Income and Budget (APBDesa) in parallel with the plans generated through Musrenbang Village level.

**Box. Internship and training sessions conducted in Takalar District, South Sulawesi**

Activities	Participants	Teaching Method	Results/outputs
<b>A. Internship</b>			
Seaweed products processing in Central Lombok	3 apprentices: 1 senior processor, 1 younger marketing, and 1 very young business manager	Participants directly participated in the production process, then practiced independently: starting from selecting the ingredients, weighing, production, and packaging. The facilitator evaluated the results of participants' works at the end of the work day.	Three people with different characteristics have potential to cooperate in establishing a business of processing seaweed products. Their knowledge relating to business management, starting from business planning to development business, has improved. They also learnt and practiced the production of seven seaweed-based processed products, exceeding target set, <i>i.e.</i> , four products. The seven products generated have complied with the quality standards of UD AZHARI.
<b>B. In-house Training</b>			
Training on Seaweed Processing for fisheries products processing SMEs	25 participants comprising fishers' spouses, seaweed farmers and product processors	Using the "Demonstration and Example" method, the training includes how a job or any task is done. This method involves breaking down and demonstrating something through examples, and is easy for the trainer to teach real activities through a planning stage of 'how and why' in doing the works. This is very effective because it is easier to show the participants how to do a task, as the lectures and discussions are introduced with complete learning aids such as pictures, material texts and other visuals.	Successfully produced four types of processed seaweed products, namely: seaweed ice cream, seaweed sweets/candy, seaweed crackers, and sun-dried banana wrapped in seaweeds.
Training on clamshell for SMEs of Fisheries Product Processing	20 participants (17 men and 3 women) comprised fishers, shipbuilders, seaweed farmers, and housewives	Using the "Demonstration and Example" method, the training includes how a job or any task is done. This method involves breaking down and demonstrating something through examples, and is easy for the trainer to teach real activities through a planning stage of 'how and why' in doing the works. This is very effective because it is easier to show the participants how to do a task, as the lectures and discussions are introduced with complete learning aids such as pictures, material texts and other visuals.	Participants showed great enthusiasm and seriousness, and having acquired good understanding of the materials and methods, marketable products were generated. Upon completion of the training, the participants formed several clusters or groups for business activities based on their expertise, shared information on available raw materials for seashell products, as well as on the methods of making shell crafts from washing and shell cutting, molding/fiber manufacturing, final product design, and seashell products marketing.
Training of Seaweed Culture with Verticulture Technique	25 trainers (17 men and eight women) consist fishers, seaweed farmers, and seaweed binding women	Using the "Demonstration and Example" method, the training includes how a job or any task is done. This method involves breaking down and demonstrating something through examples, and is easy for the trainer to teach real activities through a planning stage of 'how and why' in doing the works. This is very effective because it is easier to show the participants how to do a task, as the lectures and discussions are introduced with complete learning aids such as pictures, material texts and other visuals.	The participants learned the vertical culture technique as an improved method for the capacity of seaweed farmers to increase production. The pilot seaweed farming using vertical long line techniques was compared with the long line method.
Training of Mud Crab Development Model	25 fishers and seaweed farmers	Using the "Demonstration and Example" method, the training includes how a job or any task is done. This method involves breaking down and demonstrating something through examples, and is easy for the trainer to teach real activities through a planning stage of 'how and why' in doing the works. This is very effective because it is easier to show the participants how to do a task, as the lectures and discussions are introduced with complete learning aids such as pictures, material texts and other visuals.	The stages in mud crab farming were introduced starting from construction of ponds, and techniques of cultivation, maintenance, harvest and post-harvest. The successful development of this technology is expected to provide an alternative livelihood for the community and eventually reduce poverty, and increased source of fresh mud crabs.

- Implementation of programs and activities by utilizing the existing financial resources in government institutions either central, provincial or district governments that are tailored to their respective programs.
- Implementation of programs and activities by utilizing the existing financing sources in private institutions, national or local level which is tailored to the programs and policies in those institutions.

The goal for the short-term plan (up to 5 years) is the implementation of development activities on coastal resources development and management, including the setting up of facilities and infrastructures to support the livelihood of the community in the Laikang Village. In the short-term period, the priority programs and activities include:

- a. Development of livelihood opportunities
- b. Livestock raising development
- c. Development of waste management
- d. Environmental love movement
- e. Development and provision of tourism services, processing of marine products
- f. Management of non-fishery potentials

For the management of the coastal resources and exploiting the potentials of the coastal resources in Laikang Village, the 'Laikang Coastal Resources Development Forum' was formed with the objective of assisting the Laikang Village head in terms of ideas and inputs, from the planning and preparation until a program is successfully implemented. The project in Laikang Village had already been turned over by the Project to the community.

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