

FOREWORD

Marine resources are important protein sources for the growing human population, but these resources can be difficult to manage because of factors such as their inaccessibility and variability. Acoustic survey technology can help to overcome some of these difficulties. In particular, the development of acoustic equipment and analytical systems to process the acoustic data have been very beneficial for marine stock assessments, especially in deep areas such as the high seas. Here, I would like to mention other benefits of applying new acoustic technologies towards natural resource management in coastal areas of tropical zones.

Although coastal areas are relatively small in relation to the area of the open ocean, they contain high amounts of biodiversity and primary productivity and thus are very important for resource sustainability. In general, many small-scale fisheries are conducted in coastal areas, and these fisheries play important roles as income and protein sources for local people. Unfortunately, collecting data on small-scale fisheries can be quite difficult, in part, because much of the activity is family-based, the products are traded during face-to-face interactions. Therefore, collaboration is needed among the local fishers, researchers and governmental officers to collect reliable fisheries statistics data toward sustainable fisheries developments. In this regard, it is important to find better ways to involve the local fishers in stock assessments and fisheries management decisions.

A fishery management typically begins with a stock assessment based on statistical data, and then, regulate fishing activities up to target yields e.g. MSY etc. Authorities responsible for fisheries management then enforce the corresponding regulations. This approach seems quite rational, but it does not do enough to facilitate the participation of local fishers. There are typically no incentives for local fishers to collaborate with the managing authorities. The establishment of a system in which local fishers are given high incentives to participate in resource management would be very beneficial for coastal fisheries.

A community-based set-net fishery was installed along a beach in Rayong, Thailand, in 2003, and catch data from this fishery during 2003 to 2013 were well collected by fishermen. This success shows us how best to involve local fishers in data collection efforts. Government officials and researchers provided some initial technical and economic support for the set-net installation, and local fisheries groups were directly involved in product sales and community-based activities such as data collection. Catch data and selling data were shared among the members. Moreover, the set-net could act as a nursery for larval and juvenile fish, and as a physical barrier against illegal fishing by large vessels in the coastal zone. The members of the set-net fisheries groups demonstrated concern about the fish inside the set-net. Acoustic technology was employed to give them information about the actual number of fish in the net. If the technology actually installed to set-net, incentive of fishermen to collaborate with researchers will also be enhanced because this technology improved the efficiency of fisheries management efforts.

If local fisher groups are able to use acoustic technology to assess and monitor the fishery resources, they are better able to understand the status of the fisheries and they can utilize the resources effectively. As the depth of the coastal area is shallow in many locations, traditional acoustic surveys for stock assessments are not always a suitable option. However, some acoustic survey systems and equipment have been invented recently those are applicable to shallow waters. Even though these shallow-water systems do not have high resolution capabilities like the systems used in high sea areas, they can provide useful information and help communities visualize the fisheries resource situation in the underwater environment. Such information was found to be important for unifying the local fishers who operate in the same fishing grounds.

Recently, area-capability cycle was proposed as a model for balanced development in rural areas, The area-capability cycle consists of finding new resources, effectively using them, developing a community of users, enhancing user capability, cultivating interest in the health of the ecosystem, understanding the importance of caring for the environment, promoting activities to care for natural habitats and primary production of resources, and fostering pride and hope in users in regards to their use and care of ecosystem services. New technology can help find new resource; new technology can facilitate effective utilization of the resource. And new technology can promote collaboration of many stakeholders. What I would like to say is the development of acoustic technology can be a key for new coastal development model.

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