

COASTAL WOMEN'S SHELLFISH AQUACULTURE DEVELOPMENT WORKSHOP

Production System Design and Best Management Alternatives /Experiment/13BMA01PU

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ABSTRACT

Women play various roles along the coast of Zanzibar which contribute to their socio-economic wellbeing. Women have traditionally been involved in gleaning the coast, collecting shells of different types, collecting sea cucumber, octopus, and crab harvesting, and recently seaweed farming. Of late they are also actively involved in processing and selling fish, in bivalve farming from 2003, and in pearl farming from 2006, including jewelry making using shells. Despite their involvement in activities of this sector, women's operations are often small-scale and their incomes small as compared to their men counterparts. They are also faced with various constraints. The aim of the activity was to empower women with knowledge to help them improve their activities, empower them economically through the culture of bivalves for half pearl production and making jewelry using shells in a sustainable manner through spat collectors (Crawford et al., 2010). Information is also presented on how the women have become stronger through collaborative efforts in group formation and learning of marketing and leadership skills.

INTRODUCTION

Poverty is one of the main problems facing people living in the coastal areas of Tanzania. Women occupy a strategic position in the food production processes along the coastal community. They work for long hours between 16-18 as they bear the moral obligation of doing all domestic chores in addition to their other economic activities (De La Torre-Castro and Jiddawi 2005). With the establishment of sustainable half-pearl farming and jewelry making linked with conservation, new technique for spat collection required training and extension to encourage participation.

Women have been leaders in coastal aquaculture in East Africa being the first to culture seaweed, which has become the major type of coastal aquaculture. The shellfish farming development efforts, started eight years ago were modeled on the seaweed farming efforts, both of which were supported by the research and extension efforts of IMS and WIOMSA. Shellfish farming was a natural activity for women to adopt since they were already familiar with many bivalve species due to their reef-gleaning activities. Initially, women began shellfish farming in a low intensity fashion by placing smaller specimens of the bivalves they collected from reef areas in small, fenced-in enclosures in the intertidal area to allow them to grow to eating size. The purpose of the "fences", made of short stakes, was primarily used to designate the area claimed by the women farmers and to prevent other intertidal users from treading on the enclosed bivalves. Subsequently, they found that the stakes provided good substrates for spat collection, as high numbers of spat naturally attached to the stakes. These specimens were added to the "farmed" bivalves in the enclosed area. Women typically gather, consume, and sell nearly every bivalve species (*Ostrea spp.*, *Crassostrea spp.*, *Isognomen spp.*, *Donax spp.*, *Anadara spp.*) found on the intertidal flats including two species of pearl oysters, *Pinctada margaritifera* and *Pteria penguin* (de la Torre-Castro et al., 2017, Jiddawi, 2012). The latter two species have been utilized for half-pearl production on a limited basis on Zanzibar and Pemba Islands. Hence, unlike single species industries, shellfish farmers in Zanzibar have the luxury of being able to utilize nearly all bivalve species collected on any spat collector. Of course, developing

methods which would optimize collection of the higher value species such as oysters and pearl oysters would be most advantageous.

OBJECTIVES

The main objective of this study was conduct workshops that bring together technical assistance providers with participants from coastal villages. As the primary participants in shellfish farming, the majority of the participants were women and girls.

- 1) Provide training in bivalve shellfish culture methods;
- 2) Share results of the participatory research conducted as part of Investigation 1 and previous research; and
- 3) Develop an action plan for further development of the small-scale bivalve industry.

METHODOLOGY

The technical focus for the workshop were on spat collection, the improved nursery methods, and marketing skills. The workshops were mostly participatory in nature, and included site visits and hands-on training were also done. Workshop participants included community members, government agency representatives, village heads, district fisheries officers, private sector representatives, journalists, and local NGO's. The target for gender balance for the workshop was 50:50. Although most of the people participating in the farming activities were women, male community members also participated and provided other forms of support. Technical assistance providers were both gender. While workshops primarily focused on women shellfish farmers, the inclusion of both genders was important to achieve the expected results in developing spat collection and shellfish farming.

Several workshops were done but two major ones were held. Furthermore, since climate change impacts have already affected the other primary mariculture activity in East Africa (seaweed farming), discussions for adaptation to climate change impacts were done.

Significance

This workshop provided opportunities to provide training and a venue to discuss research and training efforts. Moreover, they brought stakeholders together to develop an action plan to guide future efforts.

RESULTS AND DISCUSSIONS

Several workshops and activities were held as listed below:

Coastal Women's Shellfish Aquaculture Development Workshop 12th August, 2017 Fumba, Zanzibar

The AquaFish project in Zanzibar hosted a one day workshop in Fumba, Zanzibar on 12th August, 2017 brought together about 35 participants, of which 28 were women participant and 5 men. The participants were from villages involved in half pearl farming jewelry making using shells (Nyamanzi, Fumba Bondeni, Fumba Chaleni, Bweleo, Unguja Ukuu and Kizingo) and conducting mariculture activities (seaweed and seacucumber farming). The workshop was officially opened by the village head of Bweleo. Two members from the Ministry of Agriculture, Livestock and Fisheries were also present. The facilitator addressed opportunities for improving the packaging and marketing of their products in order to enhance sustained benefits throughout their community. Other issues were discussed included initiating temporary closures where women collect bivalves in various sites. This workshop also aimed to strengthen the collaborations between the various villages.

Training courses and workshops for the coastal women involved in aquaculture to build their entrepreneurship skills.

Two big workshop related to this were done during the study period.

The 1st Women's Shellfish Aquaculture Development Workshop was held in Zanzibar on July 29-30th 2015, with 32 women from the villages and other project participants attending. The workshop was facilitated by WIOMSA and IMS through Dr. Narriman Jiddawi and Dr. Maria Haws (co-PI, UHH), also attending the workshop was Dr. Hilary Egan (AquaFish Director), Jenna Borberg (AquaFish Assistant), and Dr. Shivaun Leonard (USAID Washington). Representatives from Sokoine University of Agriculture were also present. The workshop was officially opened by the Ag Director of IMS Dr. M. Mtolera. The workshop provided a venue for exchange of information between IMS and Sokoine personnel, as well as the discussion of many aspects of shellfish culture and alternative livelihoods. Six undergraduate students, who were doing their field work at IMS also attended the training, including one PhD student who is doing a study on mariculture. The workshop was very successful.



Group photo of participants

The 2nd Women's Shellfish Aquaculture Development Workshop was held in Zanzibar on September 29th and 30th, 2017. This workshop brought together participants from coastal villages and technical assistance providers, including one Fisheries Department representative, fish beach recorders, and a representative from a local NGO. Training was provided on bivalve shellfish culture methods. The results of experiments on novel spat collectors from the two villages, Bweleo and Nyamanzi were shared. Participants had the opportunity to offer suggestions for further development of the small-scale bivalve industry. The majority of the participants in the workshop were women (26) since they are the primary participants in shellfish farming and 9 men were also in attendance. In addition to the training on culture methods, training on building entrepreneurship skills and identifying market opportunities were also done. The workshop was officially opened by the Deputy Village Head Bi Mwasiti M. The workshop provided a venue for exchange of information between the villages and their neighbors. The workshop was very successful.



Some participants in the workshop

Participation in exhibitions and other workshops

Through this investigation, the women were given opportunities and supported to attend other workshops relevant to what they are doing as follows:

- a. The Ministry of Labour, Empowerment, Elderly, Youth, Women and Children in Collaboration with Ministry of Trade Industry and Marketing, Tanzania Commission for Science and Technology and Voluntary Service Overseas held a two days entrepreneurship workshop on 3rd and 4th of December 2016 in Zanzibar. More than 150m participants were present. The workshop was officially opened by the President of Zanzibar Dr. Ali Mohamed Shein, who encouraged young people to get engaged in entrepreneurship instead of being idle, waiting for government vacancies which can never be sufficient. Researchers and academicians also made presentations on case studies on how to become an entrepreneur and how to organize and manage a business venture in a competitive global marketplace that is constantly evolving. The women we are working with participated in the workshop and learned new things on issues on empowerment along the coast through entrepreneurship. There was also an exhibition where they had the opportunity to present some of their products



- b. The women also participated in a one day training workshop on spat collection 20/11/2014. This was done during the visit of Dr. Simon Elis, who visited Zanzibar in November 2014. Ten farmers involved in this project from Nyamanzi and Bweleo villages, attended the training, which was focused on how to make spat collectors and use them in an efficient manner. Swahili guidelines were printed and given to each participant.

Most women in the community don't know how to swim, so the cooperation of men was important, especially in the diving activities in search of pearl oyster and establishment of the farming long line. The women activities are linked towards seeding the pearls, monthly cleaning the bags used in keeping the oysters submerged in water and jewelry making.



Training on using spat collectors

Long term collection of adult pearl oysters from the wild for pearl production is not environmentally sustainable. However, sustainable pearl production is possible through collection of wild pearl oyster spat using spat collectors. This training also was undertaken to assess settlement of natural occurring oyster spat in the bay. The collectors were hung from the line to 1m depth in the sea. Supervision and monitoring of oyster spat collection cleaning the collectors was left to the community and extension personnel from IMS. This was done twice a month. The exercise was done also as means of not only inspecting but cleaning the collectors. Records were also done on abundance and type of oyster attached in each type of materials used by the community.

During farm visits, it was stressed to the farmers why spat collection was being promoted over continued wild collection of the pearl oysters. There is concern that as the industry grows there will be a growing demand for shells that will put increasing pressure of the wild stocks with the risk of overfishing of pearl shell in the Menai Bay. Spat collection is a more environmentally sustainable way to overcome this problem and also to provide significantly larger numbers of animals for pearl production and jewelry making than wild collection can provide. Additionally, animals grown and held on farms generally produce better quality pearls and shell due a healthier growing environment than in the wild.

Participation in international workshops

The facilitators also got opportunities to attend several workshops so as to gain experiences on what others are doing. Dr. Narriman Jiddawi participated in the following workshops:

Trip to Ghana July 5 -8, 2013

Dr. Narriman Jiddawi attended the AquaFish Innovation Lab - Africa Regional Meeting at KNUST Engineering Guest House, Kumasi, Ghana in July 2013. This was a collaborative Research Support Program where several key institutions such as Sokoine University of Agriculture, Tanzania; Ministry of Fisheries, Kenya; KNUST, Ghana; Oregon State University, University of Arizona, USA Purdue University, USA; Institute of Marine Sciences Tanzania; Makerere University, Uganda were present. During the workshop, several presentations were made including field visits to Aquaculture cage farms in the Eastern Region and Aquaculture. Some group discussions in developing synergies with other groups working in Africa and description of linkages with other organizations and groups capacity building, technology development, impact assessment, outreach and other elements within each group were made. Include alignment exercises with Mission, USAID, and other groups. The workshop was a great success.

Trip to Indonesia: Apr 22 – May 1, 2016

As a host country co-Principal Investigator Dr. N. Jiddawi participated in both the AquaFish Innovation Lab meeting on April 24 – 26, 2016 and the Asia Pacific Aquaculture 2016 Conference, April 27 – 29, 2016. Dr. Maria Haws also was present. The aim of the workshop was to assess project developments and explore possibilities for synergies to develop with other regional AquaFish Innovation Lab projects. During the workshop she gave an oral presentation on sustainable pearl farming in Zanzibar using new spat collection techniques. The presentation discussed various techniques used and the progress made. She also had an opportunity to visit various exhibition and made new connections with new people. The workshop gave a new insight on aquaculture developments in Asia and Africa.



Trip to Cape town South Africa 26th June to 1st July 2017.

As a host country co-Principal Investigator of the project Dr. Narriman S. Jiddawi Senior Lecture at IMS, UDSM participated in both the AquaFish Innovation Lab meeting on 26th June to 1st July 2017 and the Annual International Conference of the World Aquaculture known as the Sustainable Aquaculture New Frontiers for Economic Growth Spotlight on Africa which was held from 25th to 30th June 2017 in Cape Town International Convention Centre, South Africa. The conference was hosted by Aquaculture Association of Southern Africa Department of Agriculture, Forestry and Fisheries, Republic of South Africa. The aim of the workshop was to assess project developments and where each partner has reached. During the workshop she gave an oral presentation on sustainable pearl farming in Zanzibar using new spat collection techniques. All presenters were given certificates of participation. The presentation discussed various techniques used in collection of spats and the progress made so far. The presentation was uploaded in the AquaFish IL web site too. Also she had an opportunity to visit various exhibitions and made new connections with new people. The workshop was sponsored by AquaFish, USA through University of Hawaii, WIOMSA and Sokoine University.



Dr. Jiddawi giving her presentation

Aquaculture America 2018 Las Vegas, Nevada, USA, 71th to 26th Feb 2018

N.S Jiddawi participated in the world Aquaculture America workshop which took place in Las Vegas Nevada between 17th to 26th Feb 2018. As a participant in the workshop, it helped her to learn about matters related to fish aquaculture and other marine organisms. Also she got an opportunity to get new links and learn from them. She made a presentation on new techniques of spat collectors used in Zanzibar. More than one thousand five hundred people from different countries attended the conference. The sponsors of the workshop were AquaFish Innovation Lab.

Monthly visit to the villages

One trip per month has been done to each of the village involved in pearl farming activity. These are Nyamanzi and Bweleo. The aim was to monitor the pilot spat collectors which have been put on how they were functioning. The spat seem to be attaching quite well. Although it was observed to be much more efficient in Nyamanzi than Bweleo village. This activity was done by the facilitator and an assistant. The aim also was to check if those involved were do the cleaning of the antifouling organisms properly. Also during one of the visits the participants of the workshop which was done in Zanzibar on shell fish a trip was made to the sites to see the area and some of the stakeholders involved.

Once the material was given to the community trips in the villages were undertaken to check on how they were proceeding in making the different types of spat collectors and to see if they were hanging them in the right way. Also a one day field trip was done in the field sites by the AquaFish project participants who were attending the regional meeting which was held at the Sokoine University, Tanzania. The group made a one day visit to Zanzibar on 11th Aug 2014.



The AquaFish group at Fumba Cooperative society building when they visited Zanzibar



Some community members during one of the village visits.

The intertidal areas adjacent to the village are considered heavily overfished with very low harvest rates, therefore the need to start spat collections was found important. Also due to the increasing community demand and need of maintaining sustainable resources utilisation for the benefit of the present and future generation, small scale half pearl farming mariculture development was recommended. This was considered as a means to address poverty and improve the quality of life for coastal communities in Fumba through increasing employment, household incomes, and food security. Trainings were done on oyster spat collection. The training also was undertaken to assess settlement of natural occurring oyster spat in the bay.



Some community participation activities

CONCLUSIONS

Spat collection has previously been tried at the communities of Bweleo and Nyamanzi, with mixed results, using imported spat bags and locally found rubber tires and coconut shells as collectors. Although training was given on how to make and deploy the new black fibrous spat collectors. Farmers were still advised to continue with the coconut shell and rubber tire collectors as these were easily available.

During the training of trainers workshop, participants learned about group formation, how to choose a leader, how to write a constitution for the group and how to write and prepare a business contract. Improving marketing skills has been one of the major focus as it is a big problem.

The workshops highlighted the importance of empowering the women economically. Group discussions were also done to address issues related to the sustainability of spat collection, half pearl farming, and jewelry making.

Several recommendations were discussed by the participants:

- Need to have sustainable local and international markets for the half pearl and jewelry produced by the community groups.
- Need to continue with the oyster spat techniques to increase production.

Some problems were also mentioned which if solved could upgrade the pearl farming and jewelry making initiatives. Which were to have a local market and to have a common point of getting some of their products

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