Capacity Building for MSMEs within Mariculture value Chain at the Kenyan Coast

PROFITABLE PARTICIPATION OF WOMEN TO MARICULTURE

Project overview

With huge economic potential presented by mariculture development at the Kenyan coast and aware of little contribution to the national GDP, recent intervention from development partners in collaboration with the government sector has informed positive progression of mariculture. With the support from GIZ, Pamoja has successfully implemented a Go-Blue project which targeted 1400 beneficiaries largely youth and women drawn from the following sectors who include; farmers, input providers, traders and other stakeholders within mariculture.

The overall project goal is to contribute to coastal economic development in an inclusive, integrated and sustainable manner being an impetus to unlocking existing potential necessary to create employment for women and youth, improve working conditions, create and enhance linkages, promote green in blue with a view of adopting environment friendly methods in five coastal counties of Lamu, Tana River, Malindi, Kwale and Mombasa.

The project has necessitated matching skills development to MSMEs as well as enhanced synergy and linkages with other actors within the value chain. Additionally, this has contributed to creation and retention of jobs, improved working environment, increase income and improved women and youth participation.

INTRODUCTION

Although gender plays a key role in mediating social relations and livelihood dynamics in fisheries, women's roles have received little attention in fishing venture. The current coast fisheries have a business model which is organized in top-down resource management system. In 2006, the department of Fisheries(DoF) introduced co-management model from Lake Victoria based on Beach Management Units (BMU) which gave resource users a role in managing and controlling fisheries resources. BMUs are multi stakeholder's bodies including fishers, boat owners, fish processors and traders, and led by executive committee of stakeholders registered with the DoF. These BMU's are managed by both men and women.

Due to cultural constraints, fishing has been a preserve of men. However, with no steady sources of income and seeing steady decline trajectory of catch due to overfishing, women decided to venture into mariculture.

The Go-blue project targeted 35% percent of women from the total target of 1400 beneficiaries which translates to 490 women drawn from five counties of Mombasa, Lamu, Kilifi, Kwale, Tana River.

Apart from women participating in pre-harvesting activities they equally play a very key role as traders in what is dubbed "Mama karanga" who provide a link between the fishery and poor fish consumers, but are also vulnerable to changes in the fishery due to a lack of education, alternative livelihoods, and capital. Mama karanga are women on the Kenyan coast who buy and process fish for local markets from small-scale fishermen

Despite women's active participation in mariculture and vital contribution thereof, there are still some bottle-necks which are the major deterrence of not just their success but the entire development of mariculture. This case provides an ideal, cost economic practices that will unlock the huge potential in mariculture.

PROFITABLE POND FARMING BY WOMEN

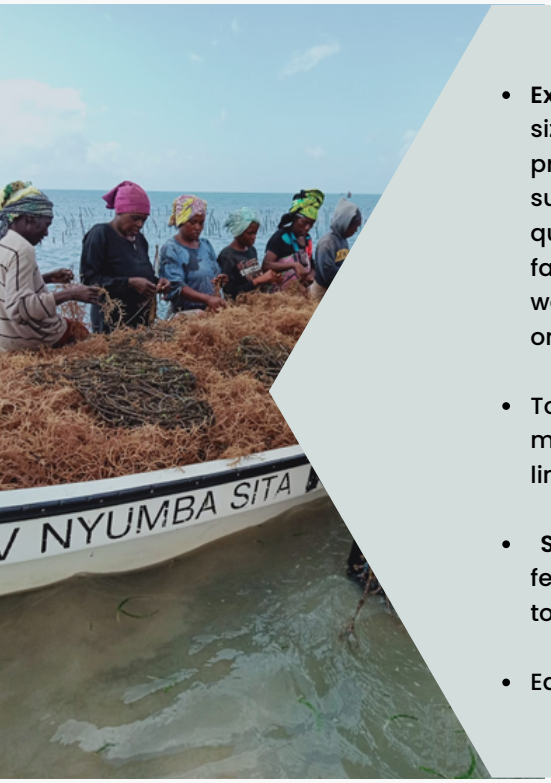
The success of fish farming highly depends on farmers' access to markets and closely monitored expenses through effective record keeping. Before embarking on the venture, farmers should consult an expert to give technical guidance.

While the project focus is not only women, their participation has proven pivotal in the advancement of mariculture sector.

A close attention is attached to commonly cultured species i.e milkfish, prawns, crab fattening and seaweed

POND CONSTRUCTION

- If the soil has more than 30% clay, farmers can construct an earthen pond.
- If the clay content is below 30%, a liner is needed.
- A well-constructed pond has compacted soil, good slopes of the dykes and a lifetime of at least 10 years with minimum maintenance.
- Ponds should be at least one meter deep.
- It is highly recommended for farmers to consult an expert for identification of the site and pond (s) construction.



Semi-intensive versus extensive farming

- **Extensive fish farming** usually refers to fish farming conducted in medium- to large-sized ponds or water bodies; the fish production relies merely on the natural productivity of the water which is only slightly or moderately enhanced. Externally supplied inputs are limited; costs are kept low; capital investment is restricted; the quantity of fish produced per unit area is low. In brief, the control over the production factors is kept low. The return on labor is high. It's also the rearing of fish in green water by applying fertilizer or manure to encourage the growth of algae which feed on.
- To succeed, farmers should stock half the pond density and wait for one to two extra months for the fish to reach market size. Extensive farming is not recommended for liner ponds.
- **Semi intensive** fish farming is the growing of fish in green water with additional feeding, thus the fish feed on algae and supplementary feeds. This allows the farmer to stock 1,000 fingerlings growing up to 350 grams.
- Earthen ponds are generally more productive than liner ponds.

Cultured species and its economic value

The following are the commonly cultured species; crab fattening, prawns, milkfish, acclimatized tilapia and seaweed and thus begs the question which could be the most profitable one? The basis for choosing what to be cultured is determined by the profit margins attached to each. Cost of production of acclimatized tilapia, prawns and milk fish is the same but the margins differ on marketability.

- Milkfish is popularly cultured in Kenya because it is a better food-converter species. Characteristics of milkfish lends itself as an excellent species for aquaculture and with wide environmental tolerances. Omnivorous with feeding behavior at a low trophic level, and rapid growth.
- Besides, in the recent past it has been promoted as a key culture species along the coast of Kenya with some level of success because of its faster growth, tolerance to high fluctuations in salinity and temperature and availability of wild seed
- Thus, milkfish farming provides a financial and livelihood motivation for the communities to engage in mangrove management and conservation (Mirera 2011a).
- Prawns have sizeable market share making it viable while its cost of production are relatively affordable
- Crab fattening is one potential venture with immense profits considering the availability of local and international market. Fattening is done in cages, pens and ponds but mostly done in cages
- With decline of fish stock, seaweed farming has become an alternative source of income. This is essential an activity embraced by women
- Widely seen culturing of these species have extensive benefit in improving livelihood through income acquired as well as environment conservation by mangrove management and conservation.

FISH POND INCOME AND EXPENDITURE STATEMENT

Below is a breakdown of the income and expenditure by a farmer who has invested in two 300m² earthen ponds.

i.Species: Milkfish/prawns

ii.Food Conversion Ratio (FCR): 1.25.

iii.Pond construction costs: Ksh 130 per m².

iv.Price of fish: Ksh 300.

v.Worker is involved in other farm duties and allocates one hour per day to tend to fish ponds-mostly done by members.

vi.Production cycle length: 8 months

ITEM	QUANTITY(Kgs)	UNIT PRICE (ksh)	TOTAL REVENUE (ksh)
Revenue from sale of milkfish	400kgs	300	120,000
EXPENSES INCURRED IN THE CYCLE			
FIXED COSTS(incurred per month)			
Item	Quantity(kgs)	unit price (ksh)	Total revenue (ksh)
Pond construction total cost	600m2	130	
Salaries	8 months	1130	
Depreciation costs(ponds materials)	8 months	650	
VARIABLE COSTS (one off cost per cycle)			
5 gram tilapia fingerlings (Pieces)	2000 Pieces	10	20,000
Fertilizer and lime	5kg	200	1,000
Fish feeds (kg)	500 kg	130	65,000
Miscellaneous		17,000	9,000
Total variable costs			95,000
GROSS PROFIT (For 2 ponds, 8 months cycle)			25,000

FEEDING

The daily amount of feed needed is determined by the size of fish, the pond temperature and the number of fish in the pond.

Table 2: **Types of fish feeds**

Feed type	Remarks
Algae (green water)	Algae can be used as supplementary feed. Use of fertilizer and manure encourages the growth of algae
	Despite being a complete diet, fish grow slowly with only algae
	The quantity of algae cannot be directly controlled by the farmer (except through fertilization).
Floating pellets (extruded)	Less wastage.
	Feed is easier to digest since it is precooked.
	Best (low) FCR
Home-made pellets	Not recommended, it is very difficult to get it right.
	Not a complete diet
	Not for professional farmers
	A lot of work for little feed, accumulates at the pond bottom and lowers oxygen levels in the long run.

Mariculture Training

FEEDING GUIDE

i. Feeding should be done at least twice a day between 11 am and 4 pm, always at the same time and spot outside the pond.

ii. The feed pellets should not be bigger than the eyes of the fish.

iii .Floating pellets reduce wastage of feeds as the farmer can tell whether the feeds have been consumed.

iv .Mash feeds have a high FCR hence more feeds are needed to grow fish.

v .Feeding should be stopped when the fish are not responding. This could be as a result of low oxygen levels and cloudy weather.

vi.Overfeeding is a waste of money and affects the water quality negatively.

vii.Fish should never be fed when they are not healthy. Signs of ill health should be checked during sampling.

viii.Feeding should be stopped at least 24 hours before transport and harvest.

ix.Feeds should always be stored on pallets (never directly on the soil) and off the walls cool and dry area.

x.Should feeds get wet, fish should be fed on it immediately as moist feeds gather mold quickly

xi.Moldy feed should never be fed on fish as it is poisonous.

MARICULTURE STATUS- CULTURED SPECIES

Impact of mariculture and coastal aquaculture on the marine environment are determined by the culture systems that covers species, intensity and technology, site characteristics, waste assimilating capacity, waste loadings, among others.

- Some farmed species are carnivorous and therefore require more protein than herbivores and omnivores. Using fishmeal to feed farmed species may motivate fishers to fish more; hence instead of reducing fishing pressure on wild stocks, mariculture may end up increasing it due to the high demand for fishmeal. Collection of seed from the wild may result in overexploitation of wild stocks or alter community composition through harvesting of new recruits.
- Clearance of mangrove areas for construction of ponds for mariculture may lead to loss of mangroves & result in reduction of ecosystem services such as breeding, nursery & filtration functions.
- Mangrove cuttings are used as pegs to hold lines and construct drying racks in seaweed farming.
- Mariculture ponds that are constructed in intertidal areas can cause eutrophication & pollution through effluents if farming takes place on large scale, and effluents controls are inadequate.
- Moving genetic materials between water bodies may introduce foreign species and threaten indigenous stocks.
- Seaweed mariculture farms may change aesthetics & impact on the marketing potential of
- Popular tourist areas.

CONCLUSION

Women have always played a significant role in the aquaculture(mariculture) sector development, operating in a range of activities relating to production, processing, trading, and marketing. However, their contribution to the sector is often under-recognized, with policy-makers often failing to realize their involvement. These contribution is not only limited to economic development but also sustainable social cohesion.