Improving Nutritional Status and Livelihood of Marginalized Women Households of Southwest Bangladesh through Aquaculture

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Main rivers and river-basins

- Ganges
- Tista
- Brahmaputra
- Jamuna
- Surma
- Padma
- Garai
- Arial Khan
- Meghna
- Halda
- Karnaphuli
- Kaptai Lake

Division:
- Dhaka
- Chittagong
- Khulna
- Rajshahi
- Sylhet
- Barisal

- Rivers
- District
- International
Background

Mud crab (*Scylla serrata*) is an important aquatic species or resources in the coastal regions of Bangladesh. Crab fattening and culturing is an emerging industry in Bangladesh.

Over the past few years, GOB has earned a significant amount of the foreign currency by exporting the fresh crab. In local and international markets, crabs are now more demandable.

Due to less at risk to the disease, simple farming methods, more resilient due to the hostile

Crab fattening is becoming the income opportunity (IGA) for coastal vulnerable community due to Climate change, natural disasters.
* Currently, 37.8% of crab fattening and culturing facilities are owned and operated by women.

* Many of the household members of these women-owners are malnourished and live in impoverished.

* The study was conducted in order to promote the integration of tilapia (*Oreochromis mossasmbicu*) into traditional mud crab culture, thus diversifying their crops and improving household nutrition.
Objectives

* Determine present status of household nutrition through surveys to understand the contribution of cultured fish species to the nutrition of women-led households.

* Disseminate better management practices, including the integration of tilapia, to facilitate both greater availability of fish for household consumption, and environmental sustainability for the current farming practice of mud crab fattening/culture.

* Formulate policy recommendations to improve the nutritional status and livelihoods of marginalized women-led households in the Southwest region of Bangladesh through integrated and diversified aquaculture practices.
Bangladesh coast
Methodology

**Base line survey**

- Direct observation
- Household survey (Questionnaire survey), Focus group discussion, Key informants interview

A baseline survey of 150 mud crab farmers in the Satkhira, Khulna, and Bagerhat regions was conducted focusing on their food consumption, dietary nutrition and earned incomes. Household demographic and socio-economic information was also collected.
Focusing on two key aquaculture species, tilapia and mud crab to be integrated in polyculture. Sites were selected in three districts: Khulna, Bagerhat & Satkhira

Total number of surveyed plot N = 150 and no of treatments 03 (n=45; 15 demo plots/district)

T1: Control-only traditional mud crab practice
T2: Integrated tilapia-mud crab farming, where tilapia will be sold to market
T3: Integrated tilapia-mud crab farming, where tilapia will be consumed by the HH & sold to market
Study Area
Methodology

Two key aquaculture species, tilapia and mud crab to be integrated in polyculture.

45 farmers were selected, 15 from each region originally surveyed.

Five farmers continued with the traditional mud crab fattening procedures (T1). Ten of these farmers were instructed on methods of mud crab and tilapia stocking. Five of these ten farmers sold their tilapia products to market (T2) while the other five kept the tilapia for direct consumption by their household members T3.
Both treatments were stocked with mixed sex brood tilapia at a density of 1 fish/m². Mixed sex tilapia were used to allow continuous breeding.

- Mud crab were stocked at 3 crabs/m² in all ponds

- After breeding, small tilapia (~10g) were harvested regularly/weekly for use as supplemental crab feed

- Large size tilapia (>100g) were harvested for family consumption

- Production, Consumption, Data were collected
## Activity Performed

### Pre Stocking (crab & tilapia) Management of Research Plot

<table>
<thead>
<tr>
<th>Pre Stocking Management for Crab (demo farmers)</th>
<th>Pre Stocking Management for Tilapia (done by the demo farmers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting bamboo fence (50ft X 30 ft)</td>
<td>Liming (3kg/decimal)</td>
</tr>
<tr>
<td></td>
<td>Use of fertilizer (Urea 75gm/decimal and TSP 100gm/decimal)</td>
</tr>
<tr>
<td></td>
<td>Maintain clean water (Avg. water depth 1.5 ft)</td>
</tr>
</tbody>
</table>

Crab point with bamboo fence “*Pata*”. Covered by net.

1 ft below the soil

2.5 -3 ft upper the water surface
## Activity Performed

**Stocked Crab and Tilapia**

- **Crablets/Crab Insister** (individual weight 0.60 to 3.2 gm) at Rampal Bagerhat & Khulna Site
- **Juvenile crab** (individual weight 18 to 25 gm) at Shyamnagar Satkhira Site

<table>
<thead>
<tr>
<th></th>
<th>SD</th>
<th>Avg. Wt (gm) in Munshiganj</th>
<th>Avg. wt (gm) in Rampal &amp; Dacope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crab</td>
<td>1000 (avg. 3/m²)</td>
<td>22.3 kg</td>
<td>10.4 kg</td>
</tr>
<tr>
<td>Tilapia</td>
<td>350 (avg.1/m²)</td>
<td>11.2 kg</td>
<td>11.2 kg</td>
</tr>
</tbody>
</table>

Avg. pond size (point) 300 sqm.
In every month 15 participant of each area have to meet for regular follow-up meeting continuously in a month interval.
Activity Performed

Nutritional Follow up
Basic Discussion & Follow up

- Basic concept of food & nutrition
- Cause of malnutrition
- Balance diet
- Complementary feeding
- Hygiene
- Importance of home stead gardening
- Care for child & mother
- Tilapia as source of regular protein

- MUAC Measurement
- Feeding behavior
- Daily meal consumption
- Weight gain/loss

Production with HH Socioeconomic Data
HH Consumption with Nutritional Data
Marketing Data
Activity Photographs
The survey revealed that the majority of mud crab farmers are poorly educated, receive low dietary nutrients, and are malnourished. The inclusion of tilapia in mud crab fattening and culture farms in this pilot study led to greater overall growth and production of mud crabs.

Addition of tilapia had benefited in increasing income and availability of nutrient-rich foods for farmer’s households. The women and their household members had consumed more high quality protein in their diets leading to better health and decreased malnourishment.
Total increase in income for the entire household, income that can be included in purchasing necessary foods for the health and well-being of all members of the household

- Household consumption was increased than the baseline data
- Specially protein intake was found more higher
- MUAC was found higher than previously measured. Total health status was increased
- Saving status increased
- Monthly saving was higher
- Crab production was increased
## Results

### MUAC Measurement

<table>
<thead>
<tr>
<th></th>
<th>MUAC (mm) in Shyamnagar</th>
<th>MUAC (mm) in Dacope.</th>
<th>MUAC (mm) in Rampal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>23.3</td>
<td>24.1</td>
<td>25.1</td>
</tr>
<tr>
<td>Progress in 1 Yr (F)</td>
<td>23.7</td>
<td>23.9</td>
<td>24.4</td>
</tr>
<tr>
<td></td>
<td>23.4</td>
<td>24.5</td>
<td>24.4</td>
</tr>
<tr>
<td></td>
<td>23.5</td>
<td>23.9</td>
<td>24.05</td>
</tr>
<tr>
<td></td>
<td>23.6</td>
<td>23.4</td>
<td>24.6</td>
</tr>
</tbody>
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(cont’d)

Monthly Income

Monthly Income (BDT/HH)

Savings status

Avg. savings amount 230 BDT/Months

<table>
<thead>
<tr>
<th>t1</th>
<th>t2</th>
<th>t3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>Progress</td>
<td></td>
</tr>
<tr>
<td>Avg. savings amount</td>
<td>230 BDT/Months</td>
<td></td>
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</tbody>
</table>
This new technology of growing tilapia along with mud crab fattening and culture had the added benefits of increasing income status along with the health and well-being of the mud crab farmers and their families.

More families are moving into these more successful culture systems. Through outreach and extensions workshops and sessions, more farmers have been educated in these techniques.

As these farmers become more successful, the technology will spread and the average incomes of the nation’s residents will continue to rise.
Activity Photographs
AquaFish Innovation Lab

Improving Nutritional Status and Livelihoods for Marginalized Women Households in Southwest Bangladesh through Aquaculture and Value Chain Analysis

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Improving Nutritional Status and Livelihoods for Marginalized Women Households in Southwestern Bangladesh Through Aquaculture and Value Chain Analysis

Aquafish Innovation Lab: Investigation 7

Understanding the impact of aquaculture on household livelihoods and nutritional status in Southwestern Bangladesh.

Keywords: Aquaculture, Value Chain, Women's Empowerment, Nutrition, Livelihoods.
Thank you