Improvement of women’s livelihoods, income and nutrition through carp-SIS-prawn polyculture in Terai, Nepal

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Partner Institutions

1. Institute of Agriculture and Animal Science
2. Rural Integrated Development Society
3. Fisheries Development Centre
4. Resource Empowerment Society

Supporting Technical Partner Institutions

1. Bangladesh Agricultural University, Bangladesh
2. University of Copenhagen, Denmark
Introduction

- Malnutrition caused by vitamin and mineral deficiencies among poor women and children is a serious health problem in Nepal (MOHP, 2006).

- Nearly, 48% of children under five years age are anemic and 49% are stunted (MOHP, 2006). Similarly, 36% of women age 15-49 are anemic (MOHP, 2006).

- There is a need to increase animal food sources particularly Small indigenous fish species (SIS) in their diet to supply essential nutrients such as vitamins, minerals and animal protein.
## Vitamin A content in fish species

<table>
<thead>
<tr>
<th>Fish Species</th>
<th>Vitamin A Mean (RAE/100g/raw, edible parts)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Amblyphtaryngodon mola</em></td>
<td>2,680</td>
</tr>
<tr>
<td><em>Rasbora tornieri</em></td>
<td>1,477</td>
</tr>
<tr>
<td><em>Clupeoides borneensis</em></td>
<td>250</td>
</tr>
<tr>
<td><em>Channa punctatus</em></td>
<td>140</td>
</tr>
<tr>
<td><em>Corica soborna</em></td>
<td>90</td>
</tr>
<tr>
<td><em>Hypophthalmichthys molitrix</em></td>
<td>30</td>
</tr>
</tbody>
</table>

(Thilsted, 2009)
- Semi-intensive carp polyculture is the major aquaculture system of Nepal. However, it does not promote household fish consumption.

- Needs to develop a sustainable fish culture technology that increases the household consumption as well as the income.

- Carp-SIS-Prawn polyculture, a better approach because
  a) Improves family nutritional status by frequent consumption of SIS.
  b) Increases household income by sale of high – priced carps and prawn.
Objectives

a. to improve the health and nutrition of women and children through increased intake of nutrient-dense SIS

b. to increase household income

c. to improve livelihoods of women
Project site

Chitwan
Target group

Tharu Community
Activities

Site selection

women farmers’ selection
Approximately 100 m² pond
- Trainers’ training
- Farmers’ training
Stocking

Carp
1. Rohu (*Labeo rohita*)
2. Mrigal (*Cirrhinus mrigala*)
3. Catla (*Catla catla*)
4. Silver carp (*Hypophthalmichthys molitrix*)

SIS
1. Mara (*Amblypharyngodon mola*)
2. Dedhwa (*Esomus danricus*)
3. Pothi (*Puntius sophore*)

Prawn
1. Giant freshwater prawn (*Macrobrachium rosenbergii*)
## Stocking combinations

**Table 1. Stocking density (number per hectare) of carps, SIS and prawn**

<table>
<thead>
<tr>
<th>Species</th>
<th>Carps</th>
<th>Carps-prawn</th>
<th>Carps-mara-prawn</th>
<th>Carps-dedhwa-prawn</th>
<th>Carps-pothi-prawn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rohu</td>
<td>3,000</td>
<td>3,000</td>
<td>3,000</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Mrigal</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Catla</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Silver</td>
<td>2,500</td>
<td>2,500</td>
<td>2,500</td>
<td>2,500</td>
<td>2,500</td>
</tr>
<tr>
<td>Mara</td>
<td>-</td>
<td>25,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dedhwa</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>25,000</td>
</tr>
<tr>
<td>Pothi</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Prawn</td>
<td>-</td>
<td>3,750</td>
<td>3,750</td>
<td>3,750</td>
<td>3,750</td>
</tr>
</tbody>
</table>
• Partial harvesting of SIS for household consumption

• Partial harvesting increased household consumption
Final harvesting
Outcomes

Production

- Average fish production - 2.6 t/ha/y
- Relatively low production due to use of poisoned canal water to the ponds
- Production is almost double in SIS added ponds
Consumption

- All household consumed fish
- Average fish consumption rate was 9 kg/household in 250 days
- Farmer consumed 54.4% of the total production in average
- Consumption increased by 20-40% in SIS growing farmers than non-SIS growing farmers
Contribution of Carps, SIS and Prawn on production and consumption

Contribution of Carps, SIS and Prawn on pondwise total Production

- Carps: 88%
- SIS: 8%
- Prawn: 4%

Contribution of Carps, SIS and Prawn in household consumption

- Carps: 81%
- SIS: 12%
- Prawn: 7%
Income earned by farmers

- Farmers sold surplus carp and prawn.
- Farmers earned NRs. 135 to 4,846 in 250 days which they utilized to cover household expenses.
- SIS ponds gave approximately 50% higher income than non-SIS ponds.
Formation of women farmer groups

- Namuna Bikash Mahila Machapalan Krishak Samuha – Fulloria
- Janmukhi Mahila Machapalan Krishak Samuha – Mudovar
- Rai Mahila Machapalan Krishak Samuha - Jeetpur and Simara
Conclusion

- Production was affected by using poisoned source water.

- Adding SIS and prawn to carp ponds increased production, consumption and income among farmers.

- Needs replication of the approach in other areas to benefit poor.
Thank you

Embassy of Denmark to Nepal