Small fish, big impact: nutrition-sensitive approaches to fish agri-food systems

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Jessica Bogard and Shamia Chowdhury
Context in Bangladesh

- 160 million people
- Confluence of Ganges, Brahmaputra and Meghna rivers
- Extensive floodplains and aquatic resources
  - Lots of fish!
- Rice is the staple food + fish, pulses, vegetables
- ‘Machee bhaatee Bangali’ – fish and rice make a Bengali

Animal source food consumption in Bangladesh
(g/person/day)

(Bogard et al, Public Health Nutrition, 2016)
Prevalence of malnutrition

- Stunting
- Underweight
- Anaemia
- Zinc deficiency
- Vitamin A deficiency

Children (<5 yrs) and Women (15-49 yrs)

(DHS, 2015; icddr,b, 2013)
Fisheries in transition

Capture fisheries and aquaculture production in Bangladesh over time

(DoF, Fisheries statistical year books, 1993-2015)
Decline in capture fisheries

• Overfishing (↑ demand)
• Industrial pollution
• Urban encroachment
• Expansion of transport infrastructure
• Changes in water and land management:
  – Floodplains mechanically drained for agriculture = ↓ area
  – Flood banks and enclosures for aquaculture prevent fish migration = ↓ biomass ↓ biodiversity
Growth in aquaculture

- Focus of government and donor policies and programs
- Significant investments in research and technology
- Proliferation of hatcheries and fish traders
- Large ag extension network
- Significant private sector investment
- World’s 5th largest producer of aquaculture products
Shifts in fish consumption over time

Consumption from capture fisheries (g/person/day)

Consumption from aquaculture (g/person/day)

(Bogard et al, PLOS ONE, 2017)
Nutritional value of fish

- Similar content of protein across all fish species
- Large variability in micronutrient content across species
- In general, non-farmed species (particularly small indigenous fish) were more nutritious than commonly farmed species

Has ↑ availability of farmed fish offset ↓ in nutrient-rich small fish from capture fisheries in terms of nutrition?

(Bogard et al, J Food Composition & Analysis, 2015)
Change in nutrient intakes from fish 1991-2010

(Bogard et al, PLOS ONE, 2017)
Implications for policy and programs

• Aquaculture has played a central role in maintaining availability and affordability of fish
  – But some unintended consequences from focusing on *quantity* rather than *quality*
• Fisheries (both capture fisheries and aquaculture) must embrace a *nutrition-sensitive approach*
Nutrition-sensitive fish agri-food systems in Bangladesh: Approaches and Lessons Learnt
Approach: Polyculture of diverse large and small fish species

- Homestead Ponds
  Isolated / Connected to Rice Fields
- Enhanced Stocking of Large and Small Fish in Wetlands Waterbodies

Focus on:
- Partial Frequent Harvesting of Small Amounts of Small Fish
- Household Consumption of Small Fish, especially in Women and Young Children
- Sale of Large Carp Species for Household Income
Approach: Integrating vegetable production

Micronutrient-rich seasonal vegetables, with focus on orange sweet potato (OSP)

• Pond dyke
• Homestead garden
Approach: Women’s engagement in production and harvesting

- Manage household ponds
- Harvest small fish with mola gill net for household consumption
- Produce, harvest, sell, cook and feed fish, OSP and other vegetables
- Women can make the gill net and earn income from selling to others
Approach: Transforming norms, attitudes and practices

- Household approach
- Work load sharing among household members
- Men - responsible for food shopping
- Mothers-in-law - in charge of kitchen and food distribution among household members
Approach: Social behaviour change communication, nutrition and hygiene messaging

- Small Fish and Vegetables in Diets of Women and Young Child
- Essential Nutrition Actions (ENA)
- Essential Hygiene Actions (EHA)
Lessons Learnt

Strengthening family and community engagement

- Men and women in decision-making
- Women’s and men’s work load sharing
- Intra-household food allocation
- Men’s purchase of foods

- Community women as promoters for production and consumption
  - empowered
  - status
  - physical mobility

- Adoption of pond aquaculture and OSP production by non-project households
Lessons Learnt

Increased Fish Production and Diversity of Species

• Large increases in nutrient-rich small fish production
• 3.5 fold increase in total fish production in household ponds
• 2 fold increase in fish production from waterbodies
• Increased production of dried small fish from waterbodies
Lessons Learnt

Increased Household Income

- Sale of Fish
- Sale of Vegetables
Lessons Learnt

Increased Fish and Vegetable Intake and Dietary Diversity

- Quantity and frequency of intake

In women and in children, starting with complementary feeding from 6 months of age
Thank you

Shamia Chowdhury: sk.chowdhury@cigar.org
Jessica Bogard: jessica.bogard@csiro.au