AQUACULTURE IN MYANMAR: FISH FARM TECHNOLOGY, PRODUCTION ECONOMICS AND MANAGEMENT

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Outline

• Myanmar Aquaculture-Agriculture Survey (MAAS) Objectives & Methodology
• Survey locations
• Land
• Species farmed
• Yields
• Input use
• Gross margins
• Conclusions & recommendations
The Myanmar Aquaculture-Agriculture Survey (MAAS)

Aims

• Baseline of information on fish and crop farming sectors (P1 & P4)
• Quantify and compare spillovers & trade-offs between these (P2)
• Explore mechanization (P3), credit, rural non-farm economy

Methodology

• Purposively selected 2 clusters of ‘village tracts’ for comparison, based on concentration of fish ponds (from satellite images) and prevailing crop farming systems
• Randomly selected communities and households to represent entire population of both clusters (including non-farm households)
• Total sample = 1102 HHs in 40 village tracts

• Community survey (in 73 villages where HH survey implemented)
• Survey of agricultural machinery supply businesses
Fish pond & aquaculture cluster locations
Aquaculture and agriculture clusters
Aqua-farm size distribution

Share of farms (frequency and area), by farm size category
Farm ownership, by size

Share of pond area (%)

- Local owner
- Absentee owner
- Company

Share of pond area by farm size category and ownership type
Aquaculture sample characteristics

• 41% specialized nurseries, 59% growout farms
• Among growout farms:
  • <10 acres = 51%;
  • 10-40 acres = 28%;
  • >40 acres = 21%

• Nursery HH: mean 3.1 acres land owned; median 2 acres
• Growout HH: 28.7 acres land owned; median 10 acres.
• Agricultural HH: 9.8 acres land owned; median 6.1 acres.
Rapid growth of growout & nursery ponds

Cumulative number of ponds constructed, 1969-2015

Cumulative area of ponds constructed, 1969-2015
Ponds purchased, or constructed on agricultural land

Use of pond land at time of acquisition, by farm type
Farming dominated by carps

Proportion of farms harvesting key species

Share of fish species by quantity harvested
But, some species diversification taking place gradually.

Cumulative number of respondents farming species, by species and year.

Respondents stocking (cumulative)

- Rohu
- Mrigal
- Pacu
- Catla
- Pangasius
- Tilapia

93%  77%
Small farms specialize more in the production of non-carp species

Average yield by species and farm size (harvesting farms only)
Yields are modest, highly variable, & correlated with farm size

Average yield, by yield quintile

- Q1: 0.6 t/ha
- Q2: 2.1 t/ha
- Q3: 4.1 t/ha
- Q4: 5.9 t/ha
- Q1: 6.9 t/ha

Average yield, by farm size

- All farms: 4.9 t/ha
- <10 acres: 3.8 t/ha
- 10-40 acres: 4.2 t/ha
- >40 acres: 5.5 t/ha

- All farms: 5.2 t/ha
- <10 acres: 5.1 t/ha
- 10-40 acres: 6.1 t/ha
- >40 acres: 6.2 t/ha
Yields closely related to feed use

Growout farm operating costs by yield quintile

Share of feed costs (%) by feed type and farm yield quintile
Use of pelleted feeds limited, but increasing

Share of farms using feed inputs, by feed type, and share of feed type in total value of feed inputs (%)

Cumulative adoption of pelleted feed, by year and feed type (2000-2015)
Use of non-feed inputs limited

- Little use of fertilizers, especially by smaller farms
- Fuel is main non-feed input cost
- Use of lime widespread
- Use of antibiotics and other medicines limited

Share of farms using non-feed inputs, by input type, and share of input type in total value of non-feed inputs
Aquaculture generates 4 times higher earnings per hectare than crop farming

Average gross margins for aquaculture and agriculture in 'aquaculture cluster' village tracts
Fish farming households are twice as well-off as the general population.

Average annual expenditure per capita, by household type:

- All households: $718
- Nurseries: $971
- All growout: $1525
- Growout <10 acres: $931
- Growout 10-40 acres: $1509
- Growout >40 acres: $2980
Conclusions

- Very large farms dominant but many more small and medium commercial farms than widely recognized
- Carp dominated, by some gradual species diversification occurring
- Tilapia and prawn perform best in smaller farms
- Very low levels of fertilizer use
- Use of pelleted feeds low but increasing
- Very wide variation in yields, but low-moderate on average and much scope for improvement
- Smaller farms obtain lower yields on average
- Yield closely correlated with size of total investment and use of pelleted feed
Implications for policy & programming

- Fish farming should be recognized and promoted as a mechanism for generating rural growth.
- Small farms (sized 10 acres or less) and nurseries should be the principal target of policy and technical interventions.
- Smaller farms have a competitive advantage in the production of non-carp species, but a disadvantage in access to capital/credit – need to find ways to redress.
- Identify mechanisms for providing commercial loans, tailored to the needs small farms and SMEs in aquaculture value chains ("meso-credit").
- Prioritize research and outreach on fertilizer use.
- Encourage private investment in the feed sector to increase competition and reduce costs of pelleted feed.