

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)

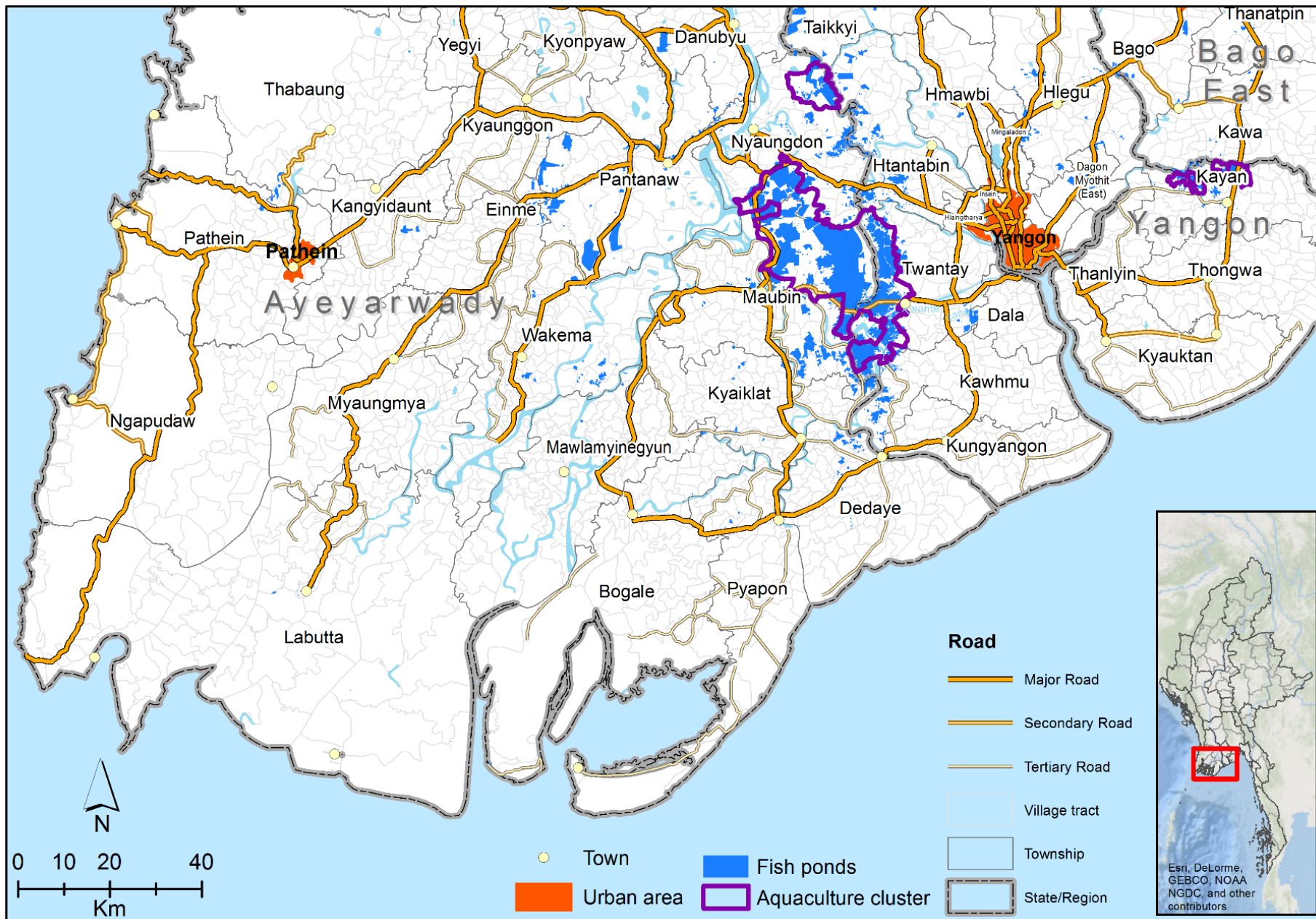
Aims

- 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

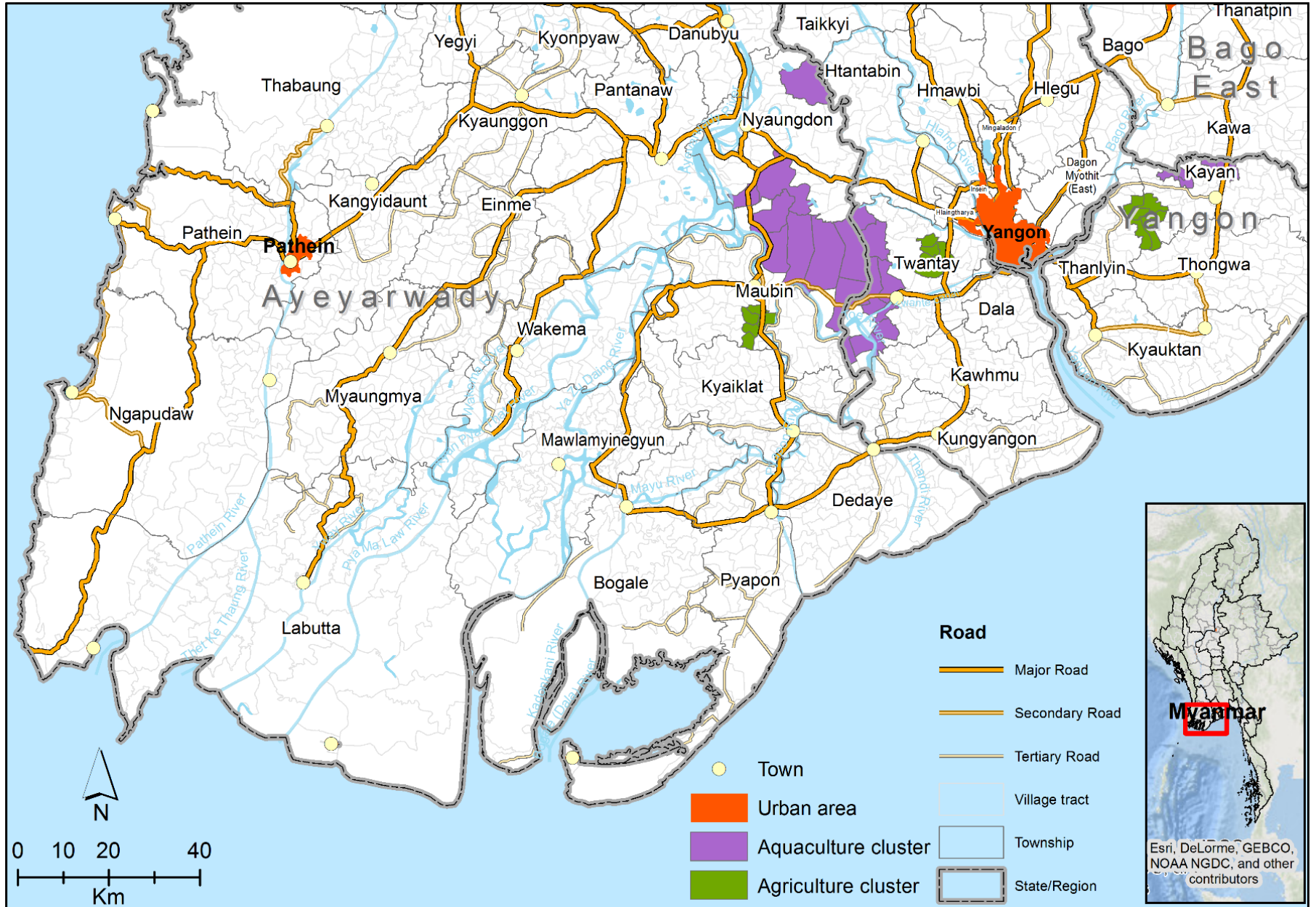
Methodology

- 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

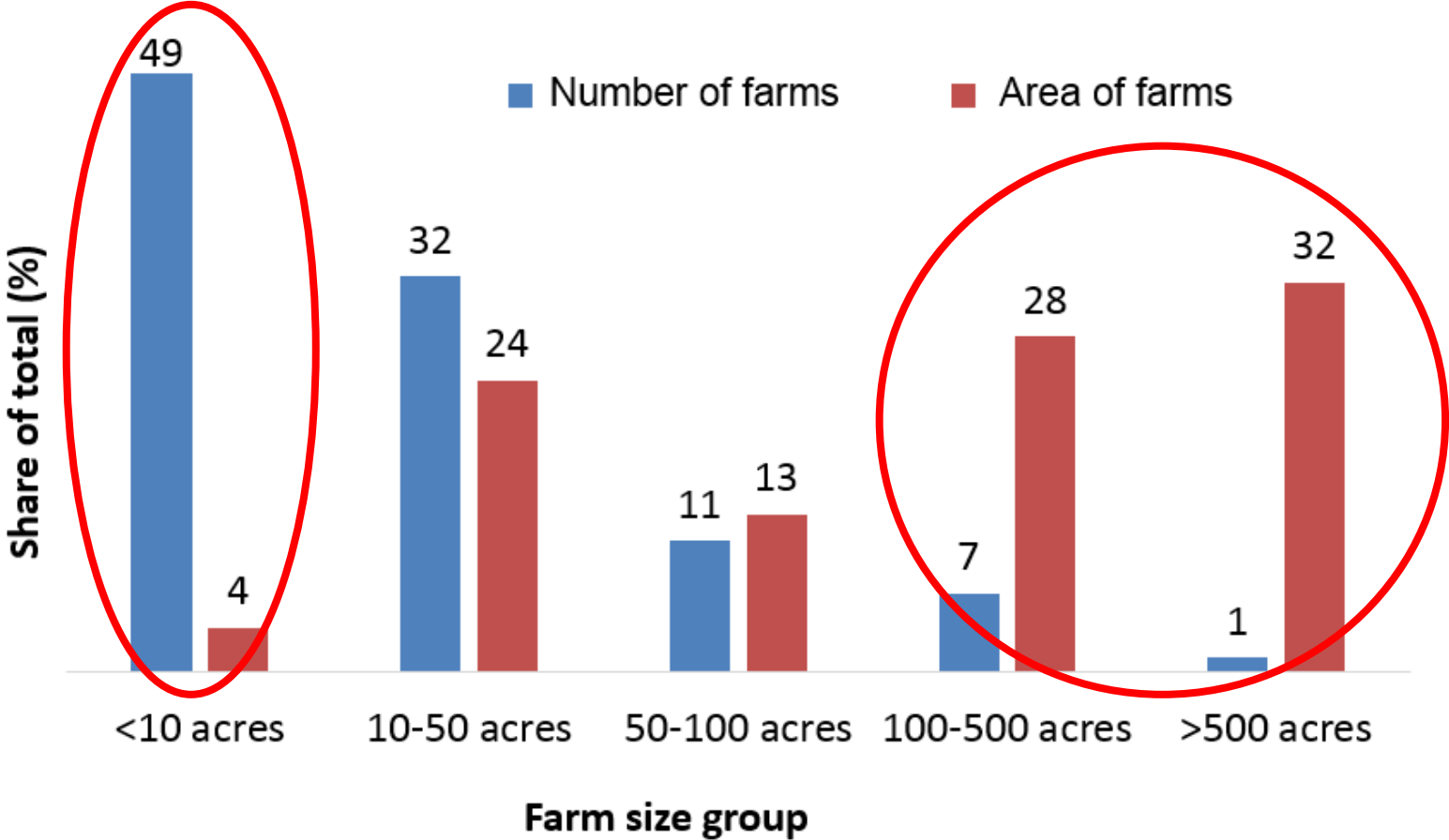
Fish pond & aquaculture cluster locations



Aquaculture and agriculture clusters

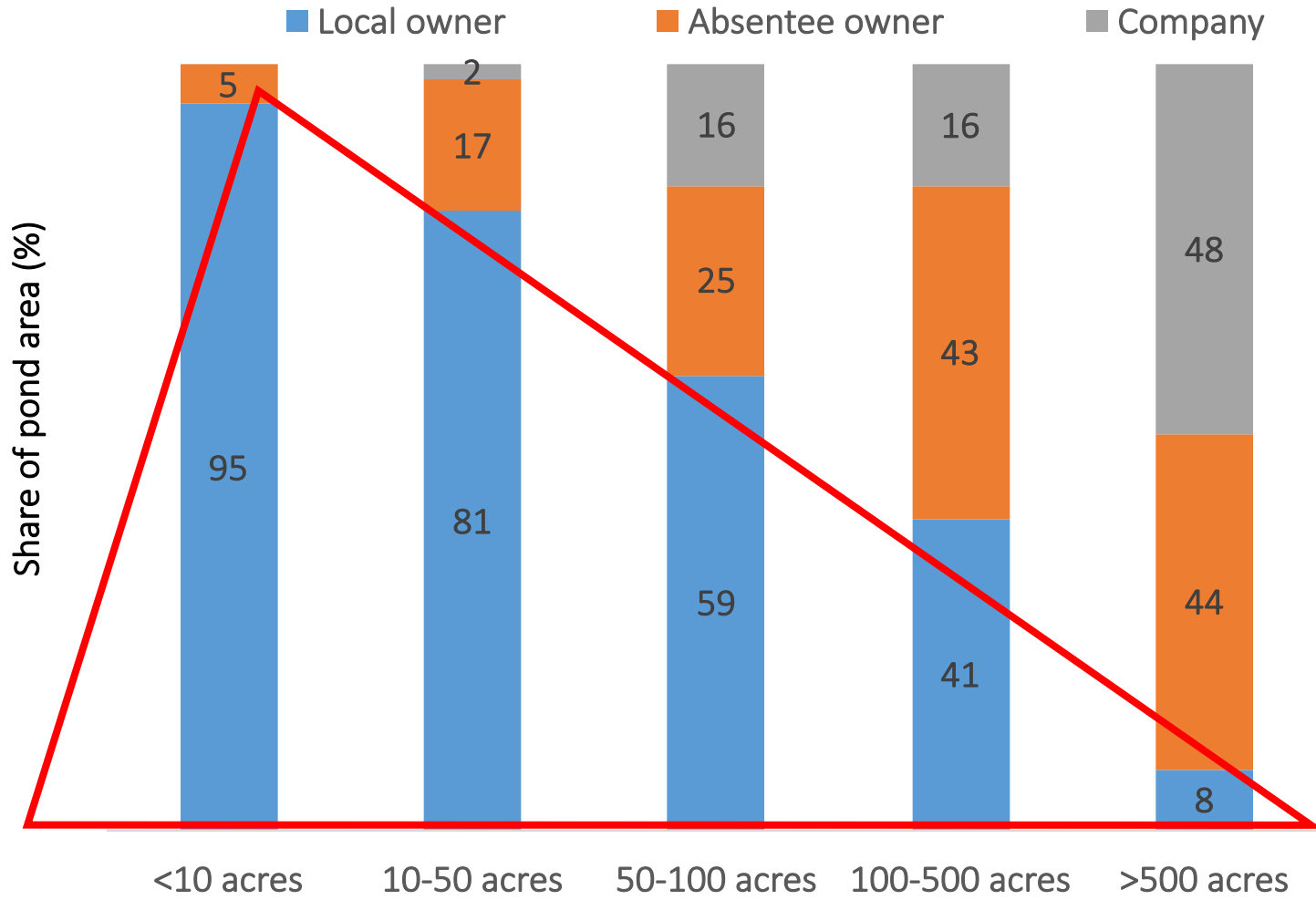


Aqua-farm size distribution



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

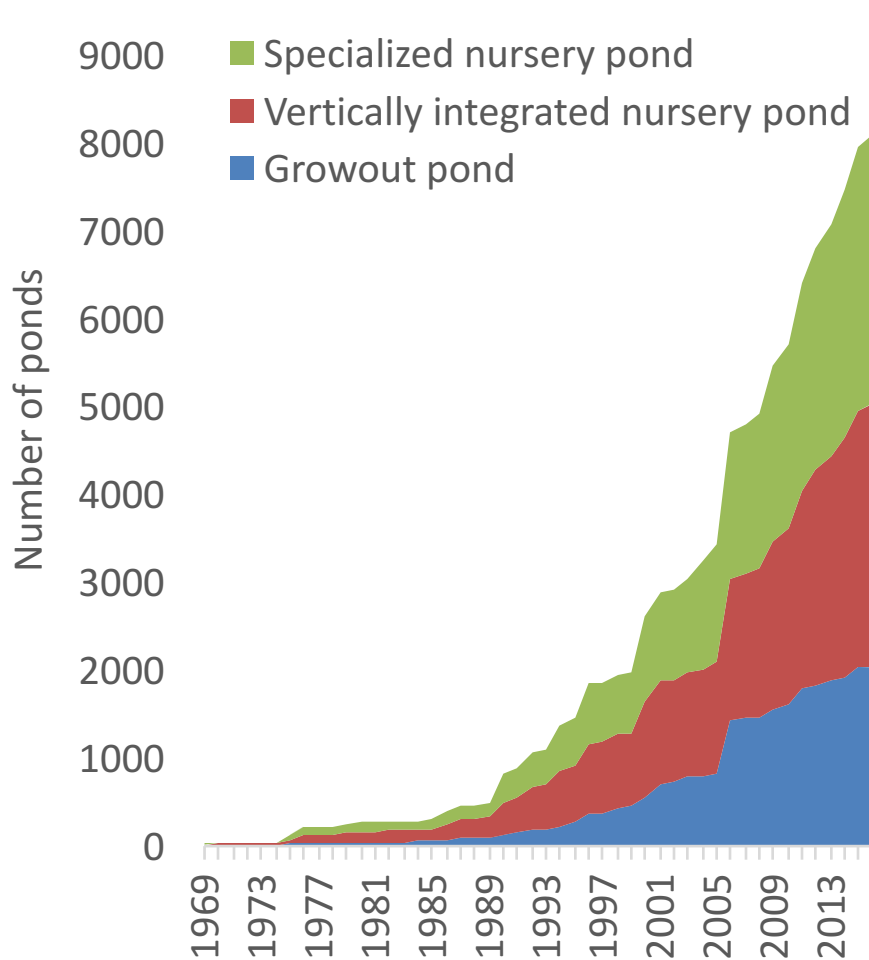
Farm ownership, by size



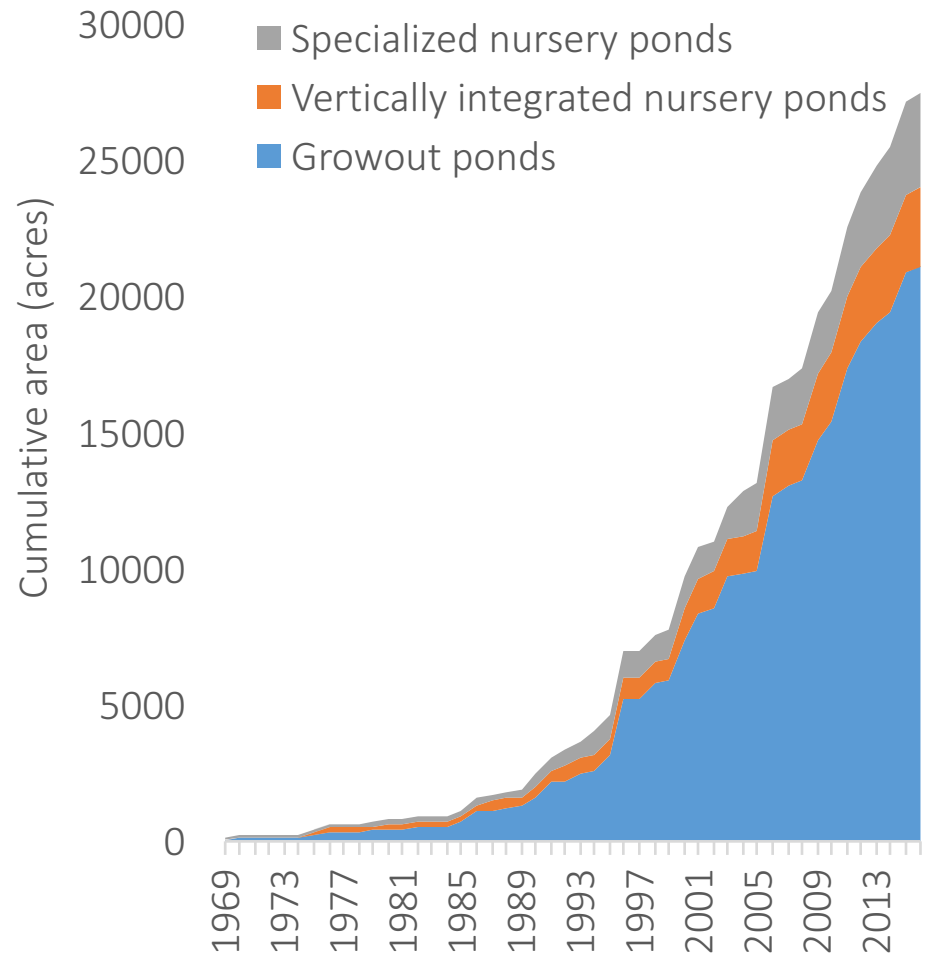
Aquaculture sample characteristics

- 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

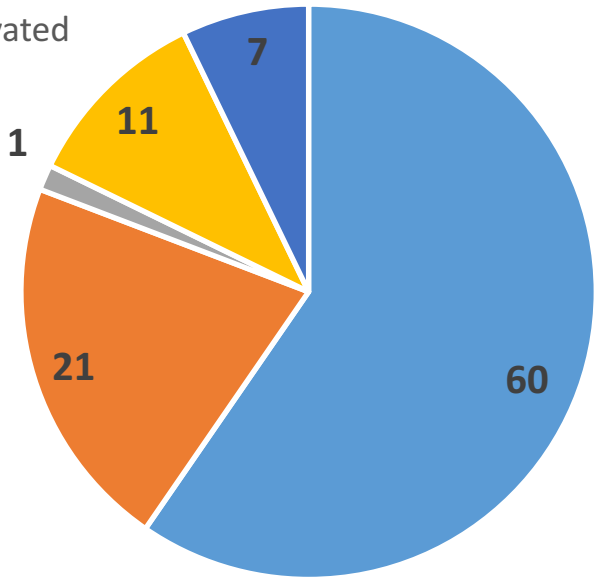


Cumulative area of ponds constructed, 1969-2015

Ponds purchased, or constructed on agricultural land

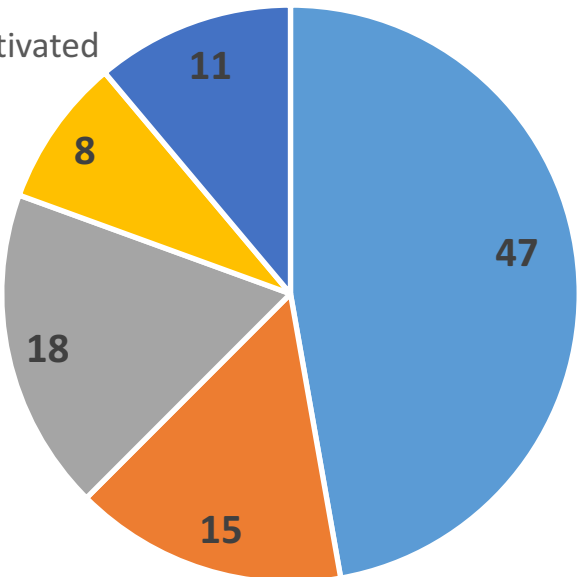
- Pond
- Paddy field
- Orchard
- Pasture/uncultivated
- Other

Growout farm



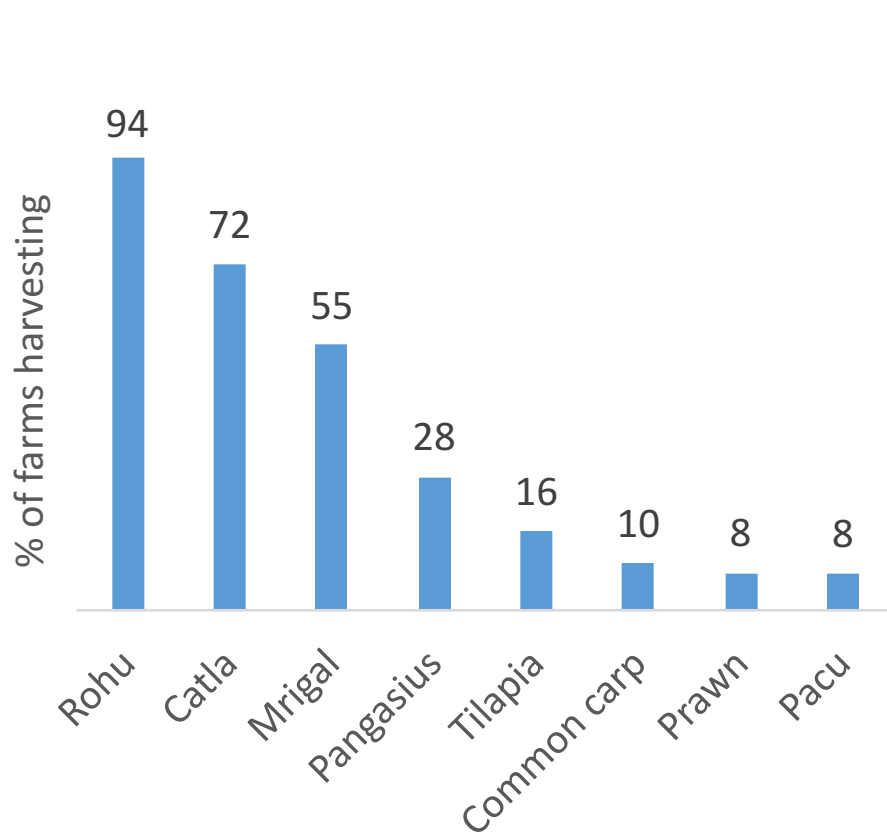
- Pond
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- Other

Nursery

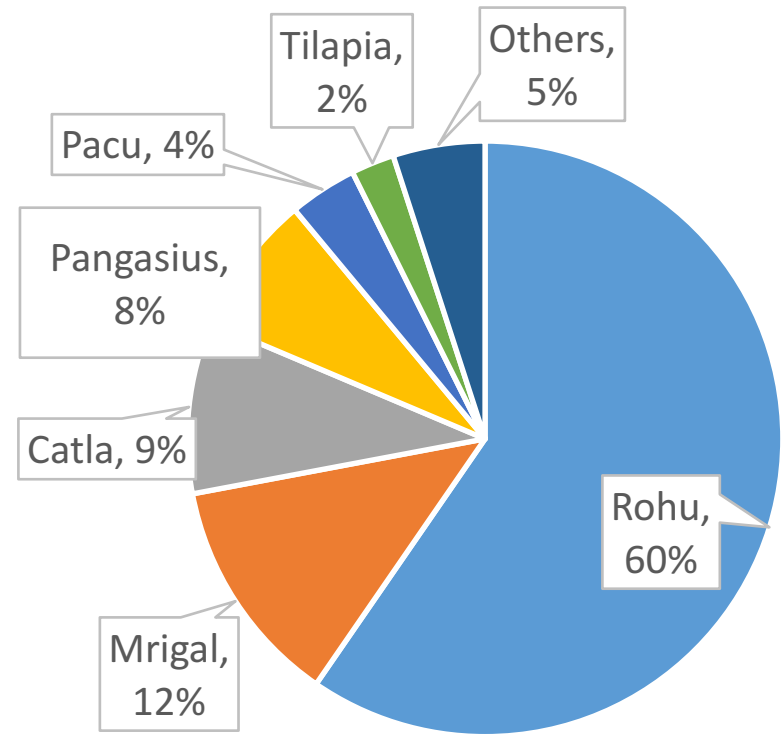


Use of pond land at time of acquisition, by farm type

Farming dominated by carps

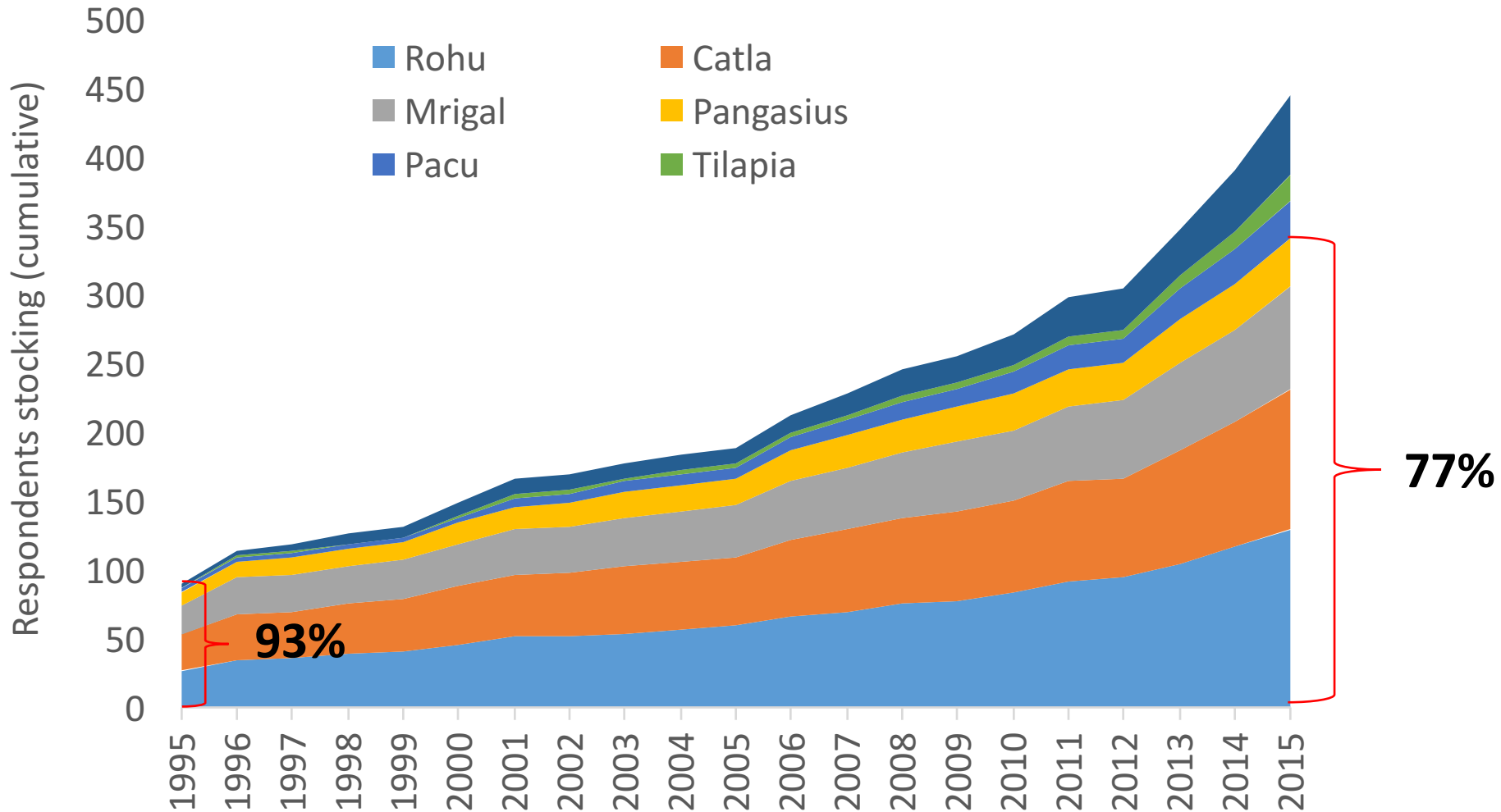


Proportion of farms harvesting key species



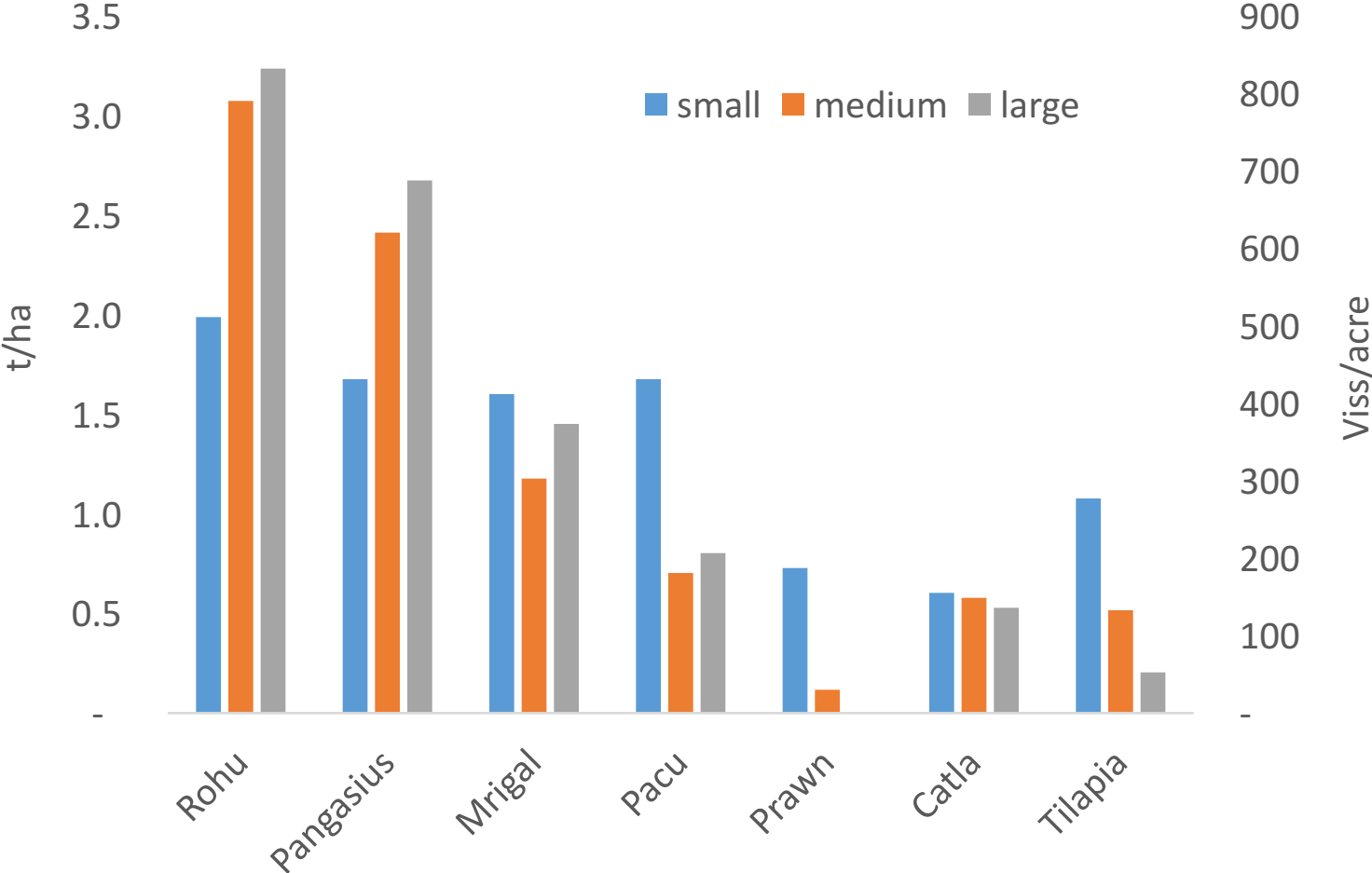
Share of fish species by quantity harvested

But, some species diversification taking place gradually



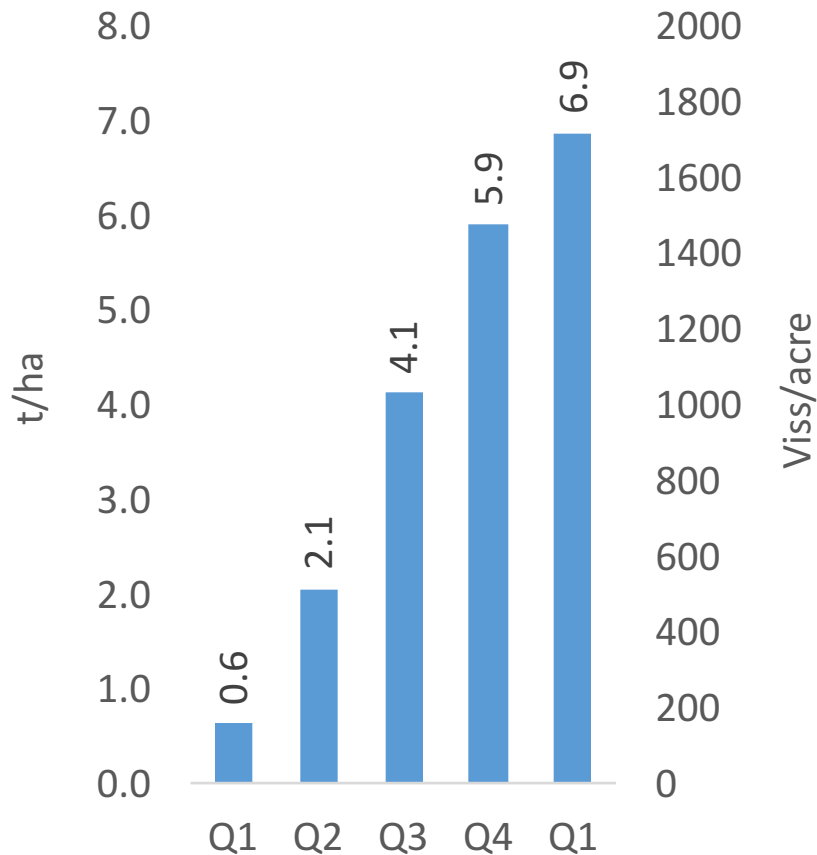
Cumulative number of respondents farming species, by species and year

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

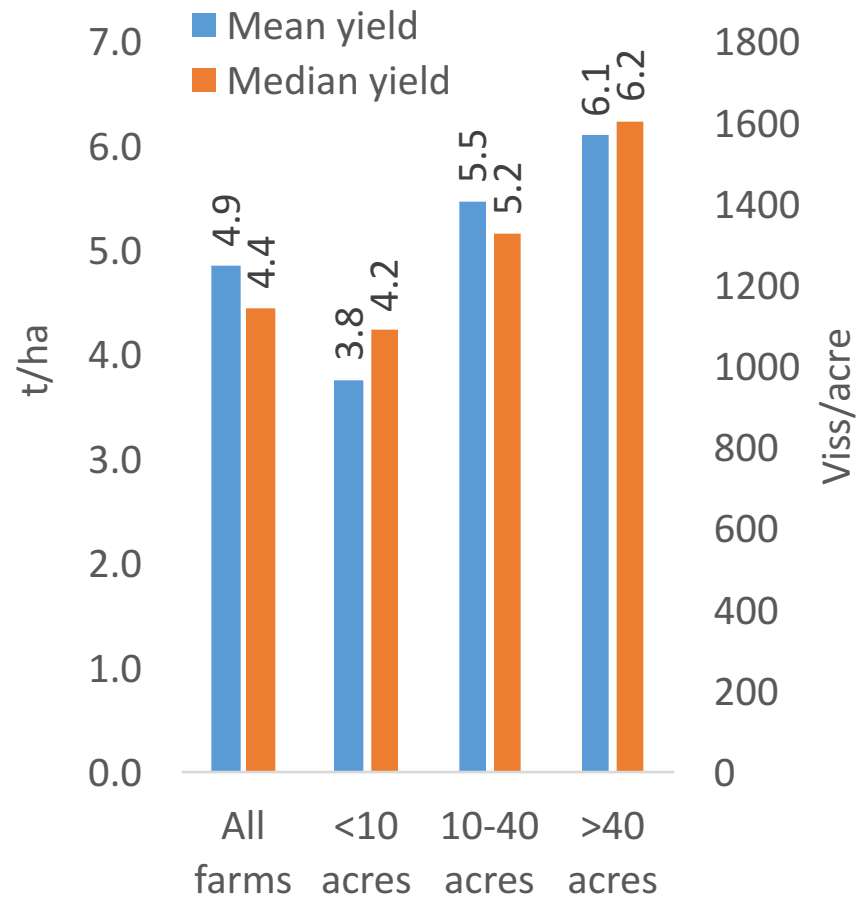


Average yield by species and farm size (harvesting farms only)

Yields are modest, highly variable, & correlated with farm size

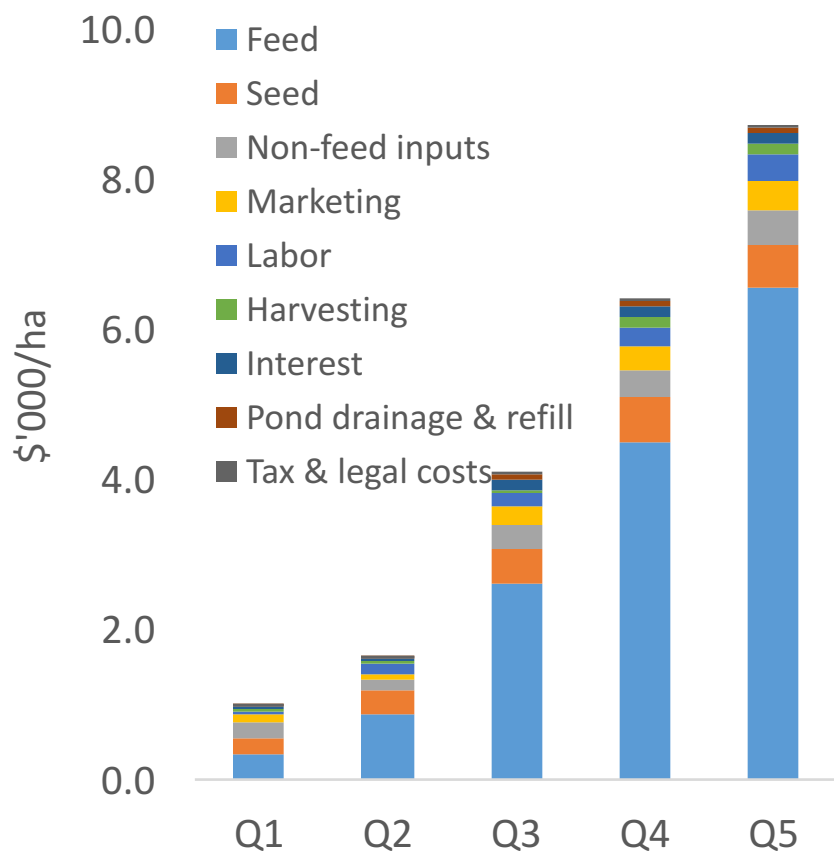


Average yield, by yield quintile

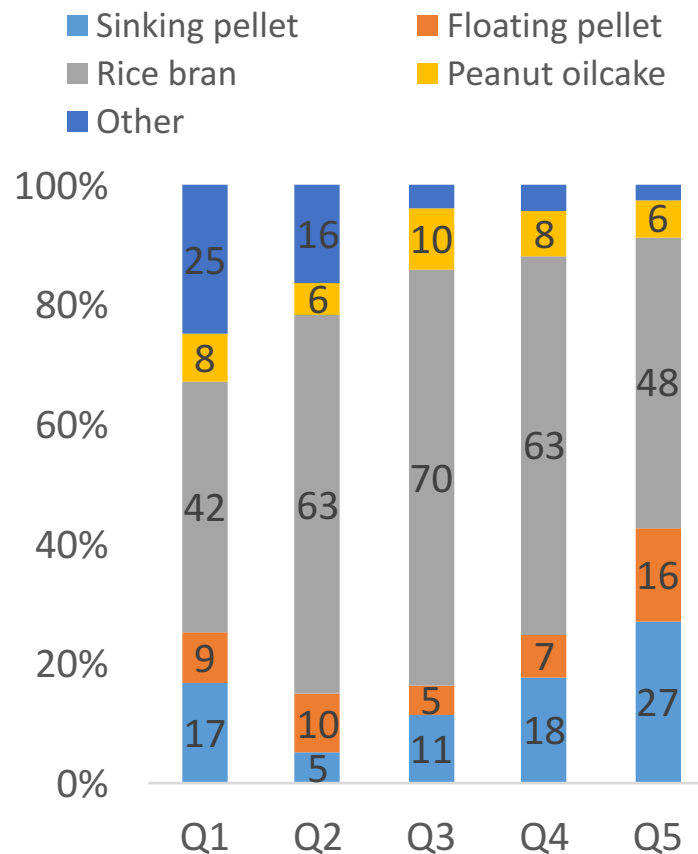


Average yield, by farm size

Yields closely related to feed use

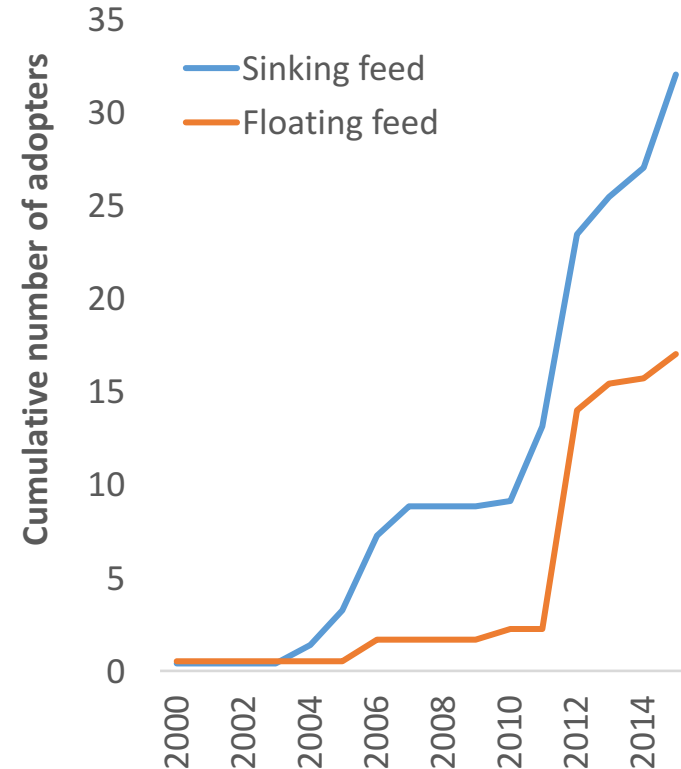
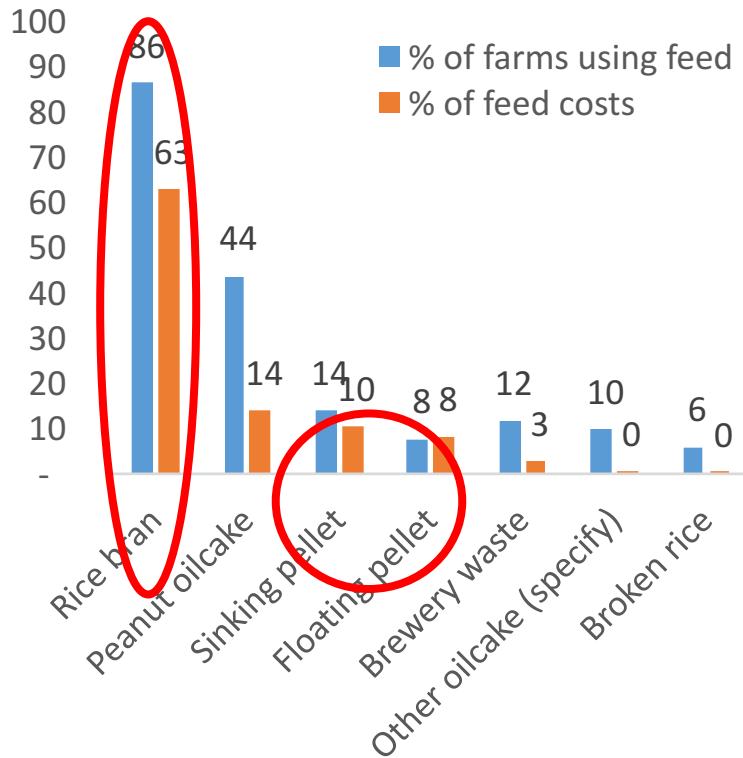


Growout farm operating costs by yield quintile



Share of feed costs (%) by feed type and farm yield quintile

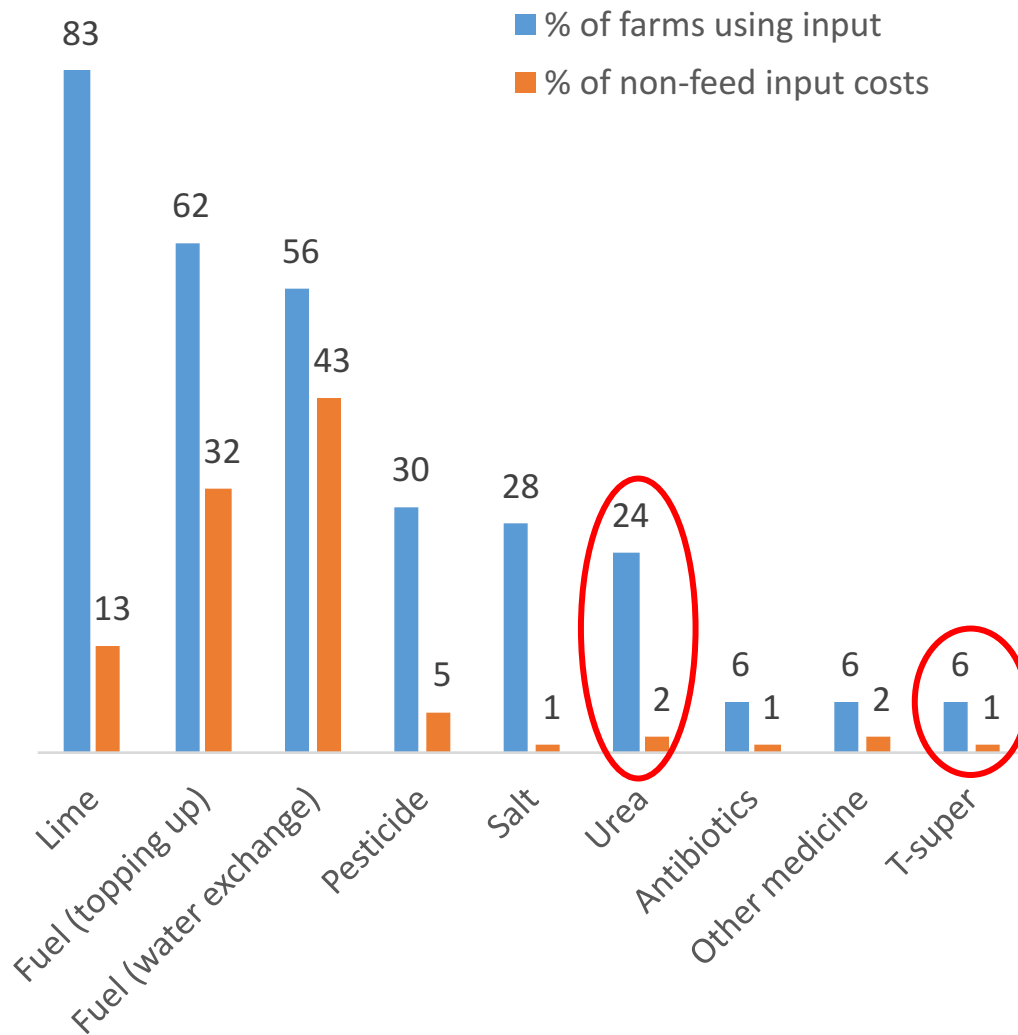
Use of pelleted feeds limited, but increasing



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)

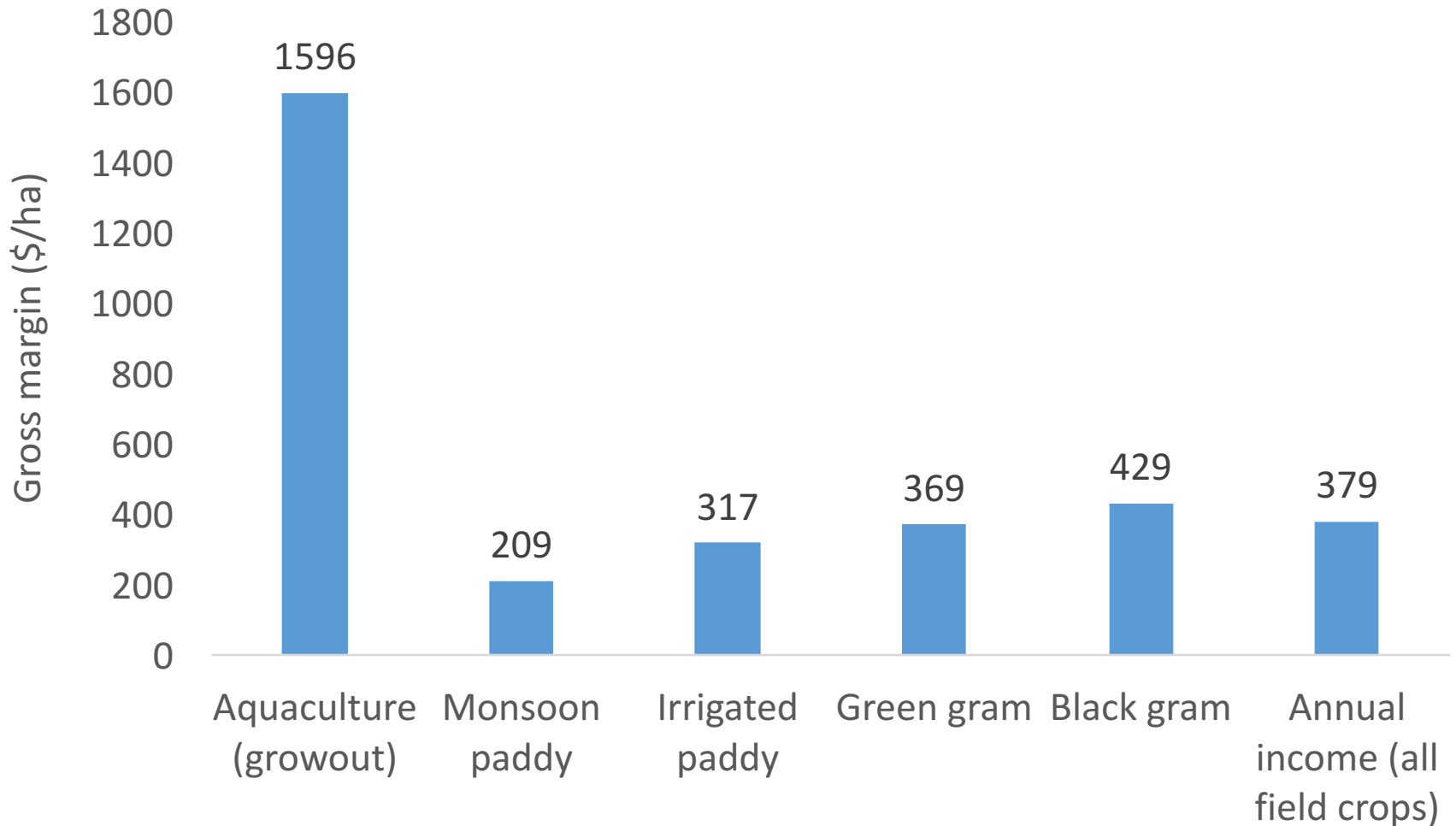
Use of non-feed inputs limited



- 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

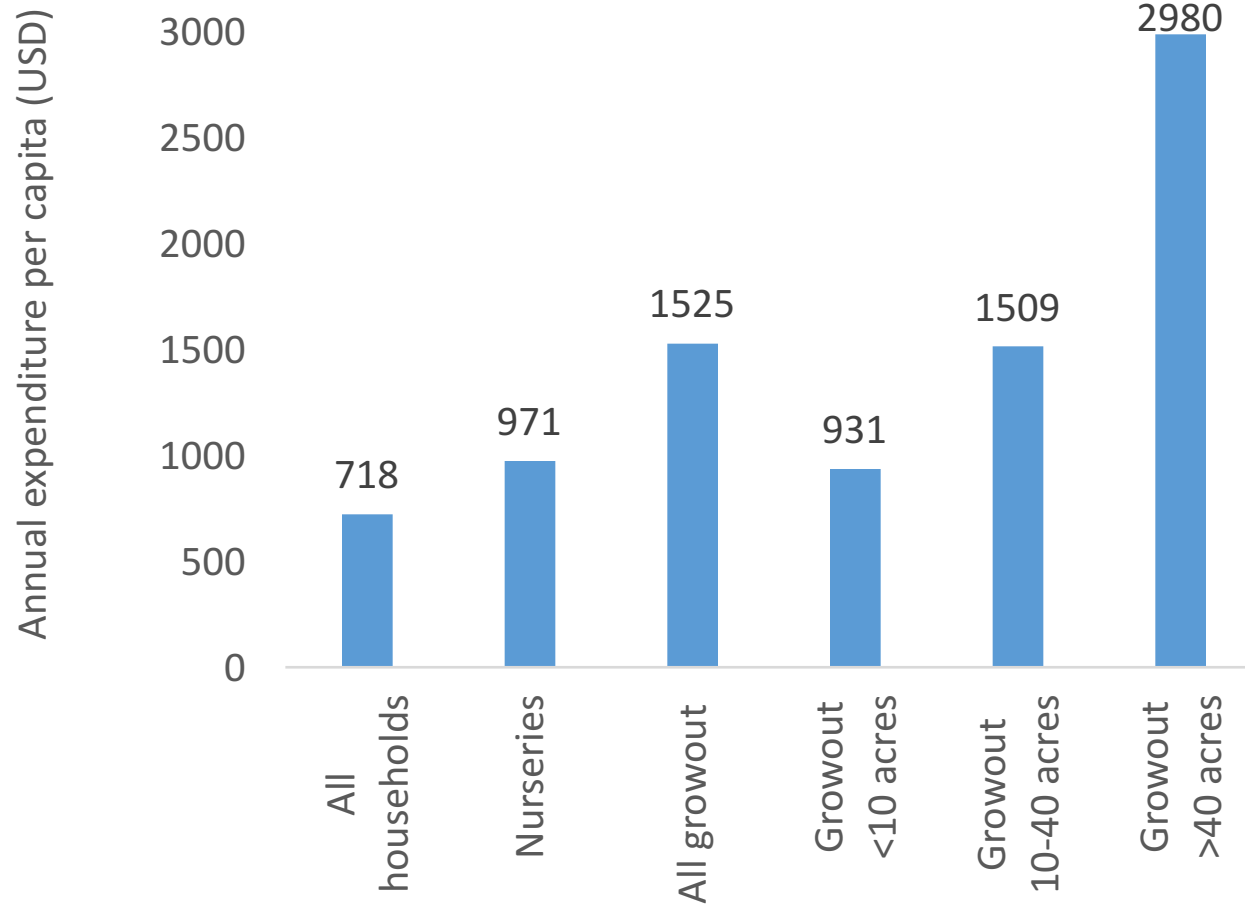
Share of farms using non-feed inputs, by input type, and share of input type in total value of non-feed inputs

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

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