Farm economics, management strategies, and risk analysis of Pangasius and Tilapia farming in Bangladesh.

Work Package 3

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The purpose of Work Package 3

The main aim have been to establish a "best practice" protocol

Optimising farm management from an economics perspective

- Which type of input should be used in the farms and in which amounts

Optimising production taking into account environmental/location issues

- Where should the farm be located
- Which species should be produced
- And what is the optimal size of a farm

Institutional settings

- Does credit constraints and land tenure affect productivity and efficiency

The base for the analytical results of WP 3

Data collection:

- Economic data, farm characteristic and the social data have been collected for 3 years (2016-2018) from the same farmers
- 1,945 farms are sampled, comprising 940 tilapia and 1,005 panga farms
- Providing a unique data set for economic analysis on aquaculture farmers

Methodology:

- Cost/benefit, cost efficiency, and profitability analysis
- Production economic models - measuring efficiency and productivity
- Risk measurement and Optimization models

Overview of achievements

- Scientific papers produced:
  - 6 published in international journals and 3 in Bangladesh journals are published
  - 2 submitted to international journals and 2 in preperation

- PHD student: 2 will be finalized in the spring 2020
- Mater Student thesis: 11

- Conference presentation and Policy briefs: 8
- Leaflet on scientific management practices:
  - 8,000 leaflet distributed to farmers over the three years of the project

Achievements (articles published or in preparation)

PHD 1

1. **Credit constraints and aquaculture productivity.** Published in Aquaculture Economics and Management
2. **Total Factor Productivity and Technical Efficiency Differences of Aquaculture Farmers in Bangladesh: Do Environmental Characteristics Matter?** Published in World Aquaculture Society
3. **Production Risk, Technical Efficiency and Input Use Nexus: Lessons from Bangladesh Aquaculture.** Submitted to World Aquaculture Society
4. **Land tenure, efficiency and productivity of Aquaculture.** In preparation

PHD 2

1. **Impact of management practices and managerial ability on the financial performance of aquaculture farms in Bangladesh**. Published in Aquaculture Economics and Management
2. **Efficiency and production environmental heterogeneity in aquaculture. A meta-frontier DEA approach.** Published in Aquaculture
3. **Agglomeration Externalities and Technical Efficiency. An empirical application to the pond aquaculture of Pangas and Tilapia in Bangladesh.** Published in Aquaculture Economics and Management
4. **Perceived risk and risk management strategies in pond aquaculture.** Submitted to Marine Resource Economics

Other:

1. **Production Risk and Technical Efficiency of Tilapia Aquaculture in Bangladsh.** Published in Aquaculture Economics and Management

Results

Farmers have a potential to increase farm productivity and profitability

- Overall results indicate that farms could improve 20-30 % on average
- The use of more feed and formulated feed have a positive effect
- The stocking density of fingerlings have a negative effect
- The mix of input is important to reach the optimal production

Other means to increase farm productivity and profitability

- Educate farmers in simple management strategies, budgeting/book keeping
- Improve assess to extension service and formal credit
- Provide farmers with risk mitigating tools (provide more strategies against price fluctuations, diseases and other risks (sharing the risk in cooperatives etc.)

Results

Spatial planning and location of farms

- Assess to water and water exchange (especially when cost of water exchange are high)
- Environmental issues and spreading of diseases
- Asses to local and regional markets

Credit unconstraint (farmers with assess to credit)

- Less depended on buyers and suppliers (feed and fingerlings)
- Better utilize specialized/industrialized input and technology

Size matters, but

- Small scale family farms can be efficient
- However, when it comes to larger size – more industrialized farms are more efficient
- Larger more industrialized farms also calls for higher educated farmers, personnel and more specialized inputs and technology (capital input is important)

Policy implications

- Support better extension service, education and training of farmers can increase production volume without increasing input use
- This will increase food security in general and improving livelihood for fish farmers in Bangladesh
- Spatial planning will become more important as the sector grows
  - Tilapia should be produced where plenty water resources are available
  - Pangas can be produced almost everywhere
  - Environmental issues, like water quality, will become more important
- Agglomeration effects and knowledge transfer may become more important
- Assess to formal credit may enhance farm productivity
- Improve logistics to serve both local and larger markets
- Research within all aspects of aquaculture (production, technique, biology etc.)

Thank you for all the good work in WP 3

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