

Fish, Rice and Agricultural Land Use in Myanmar: Preliminary findings from the Food Security Policy Project

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Outline

- The Food Security Policy Project
- Why Aquaculture?
- Fish value chain findings
- Fish, rice and land use policy

Food Security Policy Project

- USAID-funded partnership between Michigan State University (MSU), Myanmar Development Resources Institute (MDRI-CESD), and the International Food Policy Research Institute (IFPRI)
- Five year, \$9.92 million program: October 2014 to September 2019
- **Objectives:**
 - Addressing critical evidence gaps for informed agricultural policy by generating and disseminate new knowledge
 - Capacity building and strengthening for national and state/region policy systems

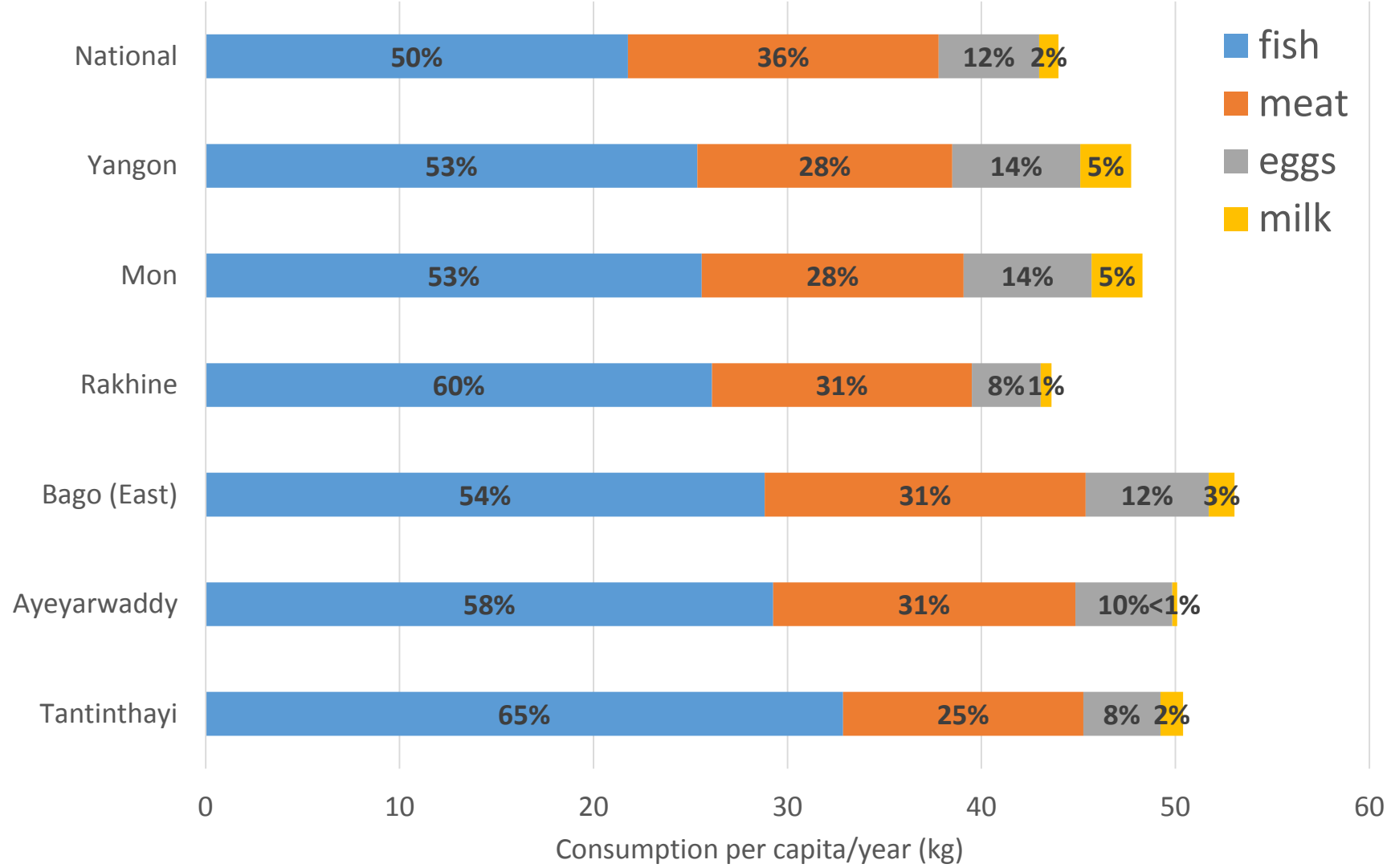
Food Security Policy Project

Components:

- Value chains and livelihoods research
 - Mon State rural livelihoods and economy survey
 - Fish value chain
 - Other product and input value chains assessments
- Policy Advising (e.g. Mon State Rural Development Strategy)
- Training and Outreach

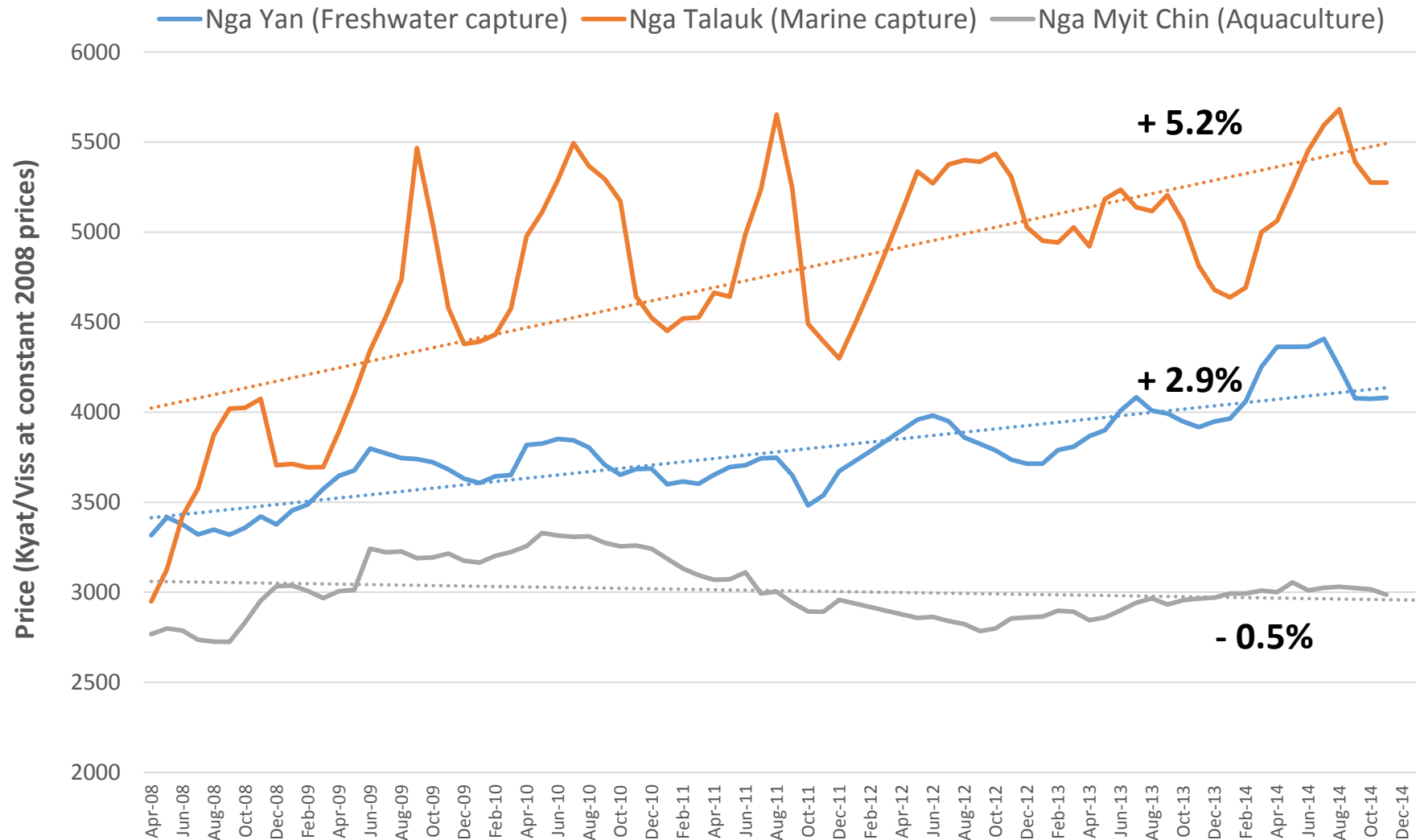
Why focus on aquaculture?

Food and nutrition security



Estimated average annual consumption of animal source foods per capita - Myanmar and selected states and divisions (Authors' calculation from IHLCA 2010 survey)

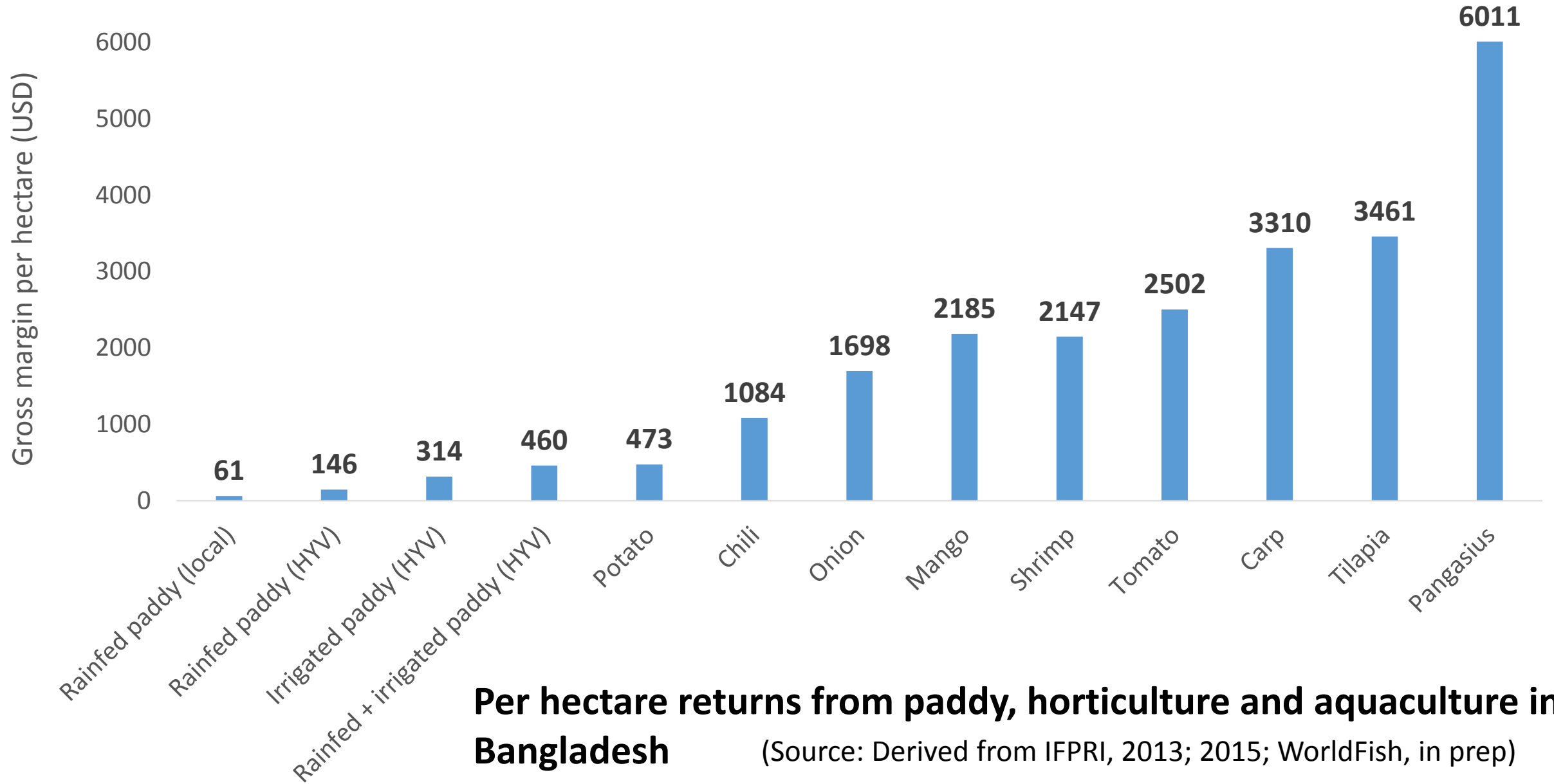
Food and nutrition security



Long term trends in real prices of key fish species from capture fisheries and aquaculture

(Source: Authors' calculation from Central Statistics Office, Monthly Economic Indicators, various issues)

Productive, high value activity



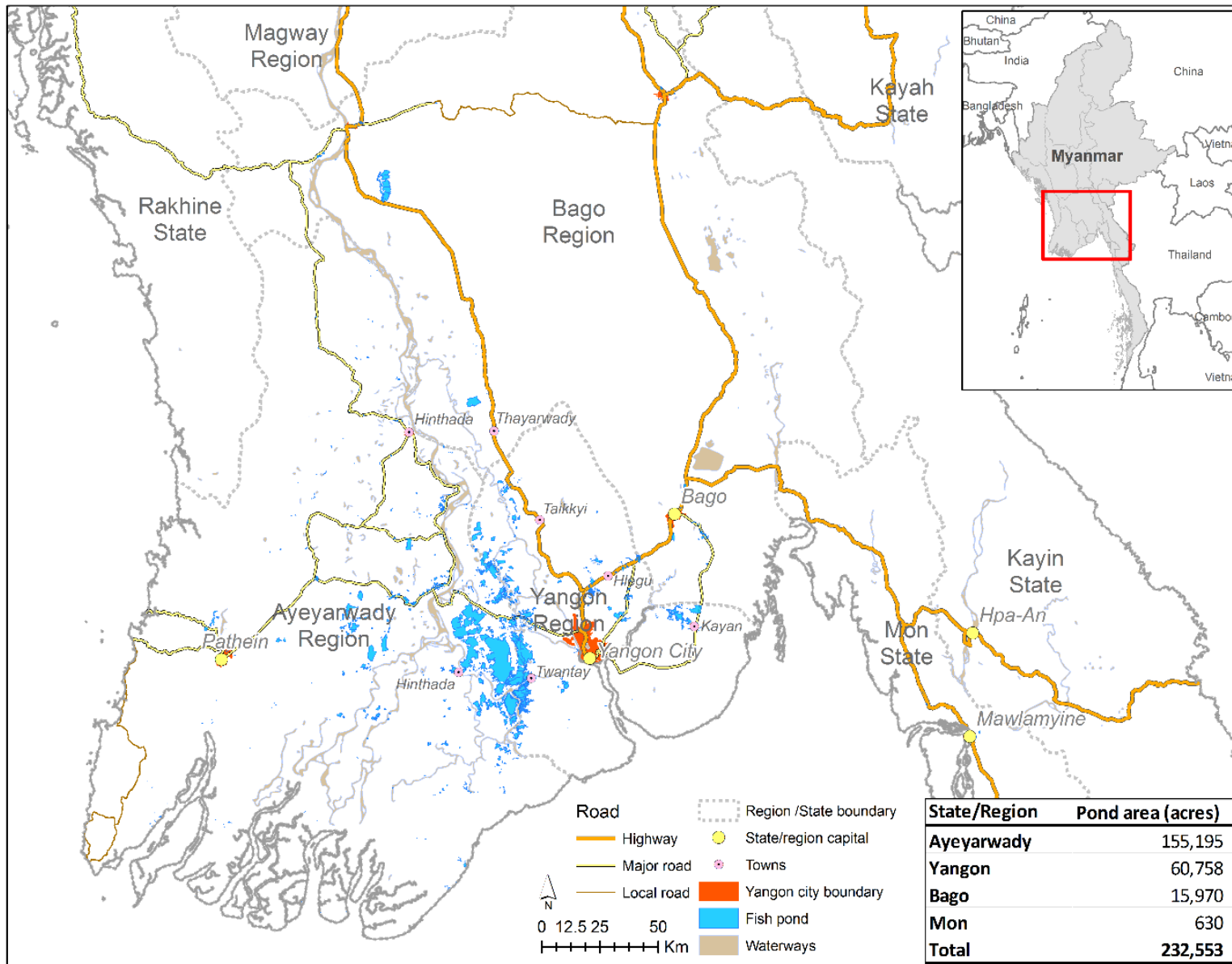
Per hectare returns from paddy, horticulture and aquaculture in Bangladesh
(Source: Derived from IFPRI, 2013; 2015; WorldFish, in prep)

Employment



Fish value chain study

- Pond survey using satellite images: Identified and catalogued all pond clusters in every township in the delta (Ayeyarwaddy, Yangon, Bago)
- Focus on freshwater aquaculture only (no coastal shrimp, crab etc. as very small fraction of total production)
- 250 interviews conducted in seven townships accounting for 75% of pond area in the Delta + Yangon city
- Focused on “meso” level changes structure in the chain over the last 10 years, and the “micro” level behavior of actors it



- Total area 232,000 acres (officially reported area in 2012/13 = 221,000 acres)

Farm structure

- In terms of production volumes, aquaculture is dominated by large scale operations – from the low 100's-1000's of acres
- However, also large numbers of 'medium-sized' farms, from 5-50 acres, including integrated poultry-fish operations
- Several specialized seed production hubs with private hatcheries and large numbers of nurseries (mainly 1-5 acres)
- ~200,000 'backyard' ponds (main purpose is drinking water supply, but increasingly stocked with fish)
- The existence of these small and medium operations is rarely recognized









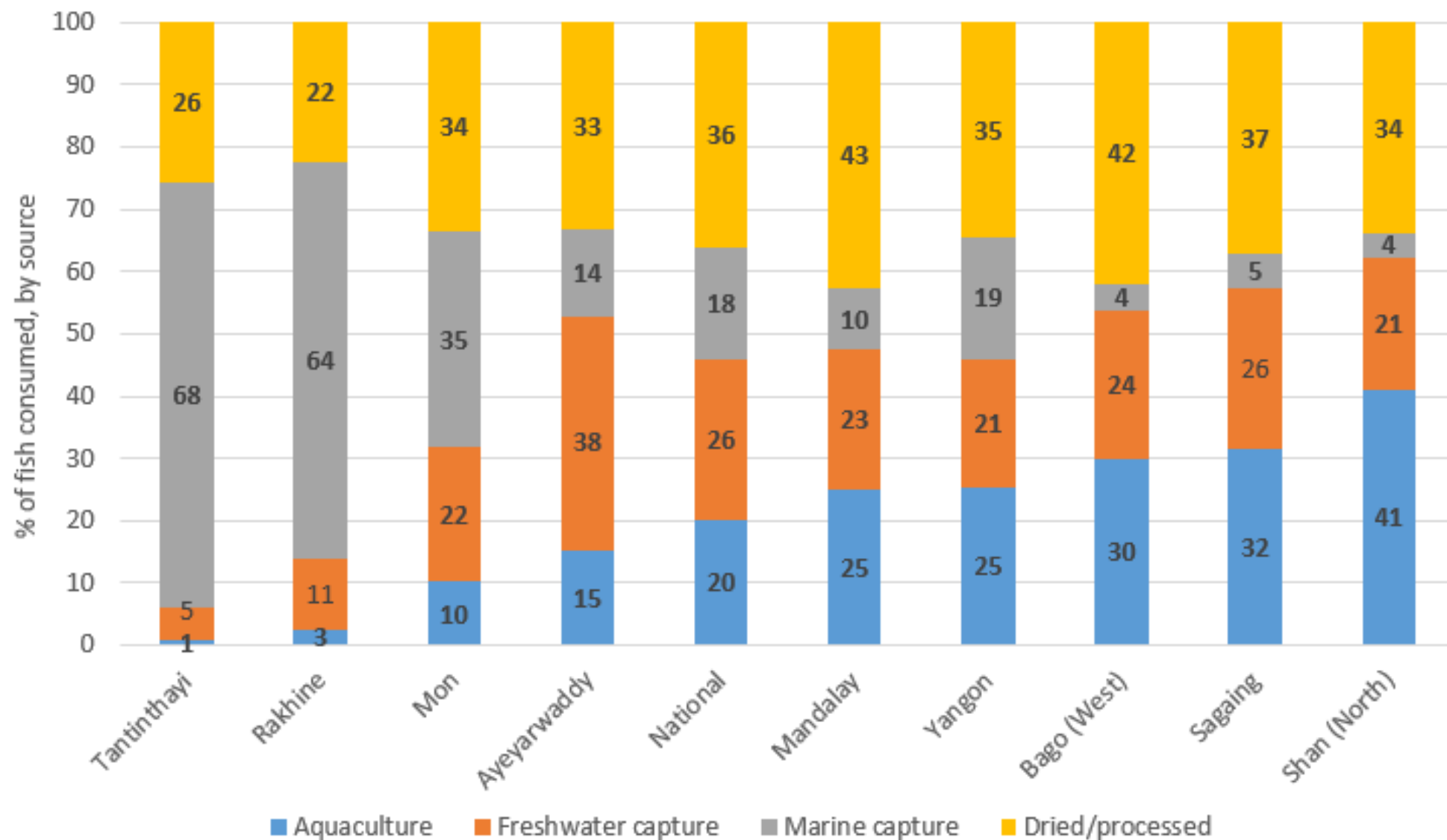
Supply side growth

- Pond acreage has increased rapidly in some areas over the last decade, but land frontier already closed in some older pond clusters, driving expansion in new areas
- Hatchery numbers increased steadily in all major clusters, and nursery growth very rapid in main seed production hubs
- A proliferation of up- and midstream value chain actors with increasingly specialized functions in key growth hubs
- Productivity has risen due to stocking larger fingerlings to shorten production cycles: Yield increases responsible for as much as half of output growth

Demand side growth

- Increase in supply primarily in response to expanding domestic markets (contrary to idea that the sector is export-led)
- Dramatic growth of demand for aquaculture fish from Upper and Eastern Myanmar since 2011
- Huge increase in the number and volume of consignments of farmed fish distributed to cities throughout the country following liberalization of regulations on motor transport and completion of the Yangon-Mandalay express way

Penetration of farmed fish into upper Myanmar



Fish consumption by source and state/division (Source: Authors' calculations from IHLCA 2010)



Land tenure

- Pond farms mainly constructed on land pre-owned and/or purchased – private land rental markets underdeveloped
- Sales of land by paddy farms to large pond operators reflects very low profitability of paddy cultivation and high levels of indebtedness (particularly in past due, to state intervention in paddy market)
- Widespread land grabbing by companies aligned to military occurred throughout Maubin and Nyaungdon in the early 2000's. Wetlands and cultivated land appropriated and converted to ponds and leased out

Land regulation

- Officially, a person wishing to convert any paddy land to ponds must apply for 'Form 39', which permits a change of land use
- In theory, it is only possible to obtain permission to convert extremely poor quality paddy land to ponds
- Obtaining Form 39 requires consent from multiple agencies at local, regional and union level, numerous visits to government offices, payment of substantial "unofficial" fees, and can take several years. It also entails paying an annual tax
- However, in most well-developed pond clusters, very few farms sized <10 acres applied for Form 39; permission from the village head was sufficient to allow pond construction and operation to take place

Land regulation

- Overall, $\leq 50\%$ of pond acreage has Form 39, although almost all commercially operated ponds have a license from DOF
- In well developed pond clusters, obtaining permission for land use conversion has not prevented the expansion of aquaculture, but raises the transaction costs of doing so
- In other areas with potential for pond expansion (e.g. Mon) these rules are more strictly enforced
- These observations prompted us to compare land use for paddy cultivation and aquaculture in Myanmar, and in Bangladesh, and possible implications of relaxing restrictions on land use...

Fish and rice in Myanmar and Bangladesh

- In both Myanmar and Bangladesh, food security has historically been equated with rice security, and rice has been placed at the center of food security policy.
- Bangladesh has also promoted aquaculture heavily (long history of development investments and supportive policy environment)
- Myanmar prohibits the conversion of paddy land to other uses; Bangladesh has no such restrictions
- Both countries are self-sufficient in rice production (Myanmar now exports a small surplus).

Growth in area under paddy cultivation

- Over the last decade, the area under paddy in Myanmar grew much more rapidly in percentage terms than in Bangladesh (4.3% per annum, versus 0.9%)
- Yields in Bangladesh grew faster than in Myanmar (2.7% per annum, versus 1.2%)
- Officially reported paddy yields are similar (Myanmar 4.05 t/ha; Bangladesh 4.34 t/ha), **but** USDA estimates Myanmar average yield at 2.7 t/ha
- Two different strategies/pathways for increased paddy yields:
 - For Myanmar, production increases have been achieved in part through horizontal expansion, often by granting land concessions to companies (85% of rice production is rainfed)
 - For Bangladesh, production increases are more related to smallholder intensification (widespread double cropping with HYVs, facilitated by groundwater irrigation)

Growth in area under aquaculture

- Bangladesh dedicates 3.5 times more land to aquaculture than Myanmar (182,000 ha, versus 647,800 ha)
- Bangladesh is the 5th largest global producer with around twice the reported aquaculture production of Myanmar (8th largest producer)
- Due to rapid growth of shrimp farming, the rate of expansion of aquaculture in Bangladesh was nearly twice that in Myanmar (4.6% per annum, versus 2.5% per annum)
- Inland fish pond area in Myanmar grew at a faster rate than in Bangladesh (4% per annum, versus 2.8% per annum), but from a lower base

Share of fish pond area to paddy area

- Despite rapid year-on-year growth in aquaculture in both countries, the area devoted to aquaculture is small share of total paddy area:
 - Inland fish ponds in Myanmar cover an area equivalent to 1.1% of paddy area, and all ponds (fish and shrimp combined), 2.3%
 - For Bangladesh, the respective figures are 3.2% and 5.6%
- In Myanmar, the ratio of fish pond area to rice area increased from just 0.010 to 0.011 between 2003 and 2013, due to concurrent expansion of paddy area

Conclusions

- Aquaculture in Myanmar has grown rapidly despite an unfavorable policy environment which increases the cost of adoption and, in some areas, prevents it completely
- Never-the-less, aquaculture practiced on a small and medium scale is more widespread than generally recognized – this is a testament to how attractive it is to farmers
- Commercial aquaculture is a high value activity, which can be viable at small/medium scale, and contributes to food and nutrition security goals
- Demand for farmed fish will continue to grow as incomes rise, capture fisheries output declines, and markets become better integrated

Conclusions

- As Myanmar's economy grows and urbanizes, rice will account for an increasingly smaller share of food expenditures, and fish will account for more. Aquaculture will account for an increasingly large share of the fish consumed
- Liberalization of Myanmar's land use policy could help increase fish pond area and fish production substantially
- The potential loss of rice area from liberalizing land use restrictions is likely to be small
- Rice to pond area ratios similar to those in Bangladesh (which has few land use restrictions) would mean an increase in total pond area from current 2.3% equivalent share of rice area to 5.6%. This implies a decrease in rice area and production of 3% or less
- When an increase in inland fish pond area is considered on its own, the potential impacts on rice area would be even smaller: from 1.1% to 3.2%

Conclusions

- Myanmar possesses ample scope to intensify paddy production, generating higher yields from the existing cropped area
- Policies should aim to *simultaneously* promote smallholder rice intensification and diversification into smallholder-led commercial aquaculture in order to:
 - Dramatically raise producer incomes
 - Increase availability and accessibility of fish to consumers
 - Reduce sales of paddy land for conversion into large scale aquaculture and appropriation of land for large scale agricultural projects
 - Avoid the environmental impacts of further expansion of the land frontier
- Reductions in paddy area from conversion to ponds could easily be made up through greater efficiency, raising Myanmar rice yields closer to levels to those achieved by its neighbors
- Not a necessarily zero sum game: more fish doesn't have to mean less rice!

THANK YOU