

# You Can Have Your Rice and Eat Fish Too: Rice, fish, land use trade-offs and food security in Myanmar and Bangladesh

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Images 1-3 (Myanmar): Feeding fish on a large farm; Preparing land for paddy cultivation; Workers eating rice and vegetables; Images 4-6 (Bangladesh): Preparing fish for a meal; transplanting rice seedlings; harvesting a pond.

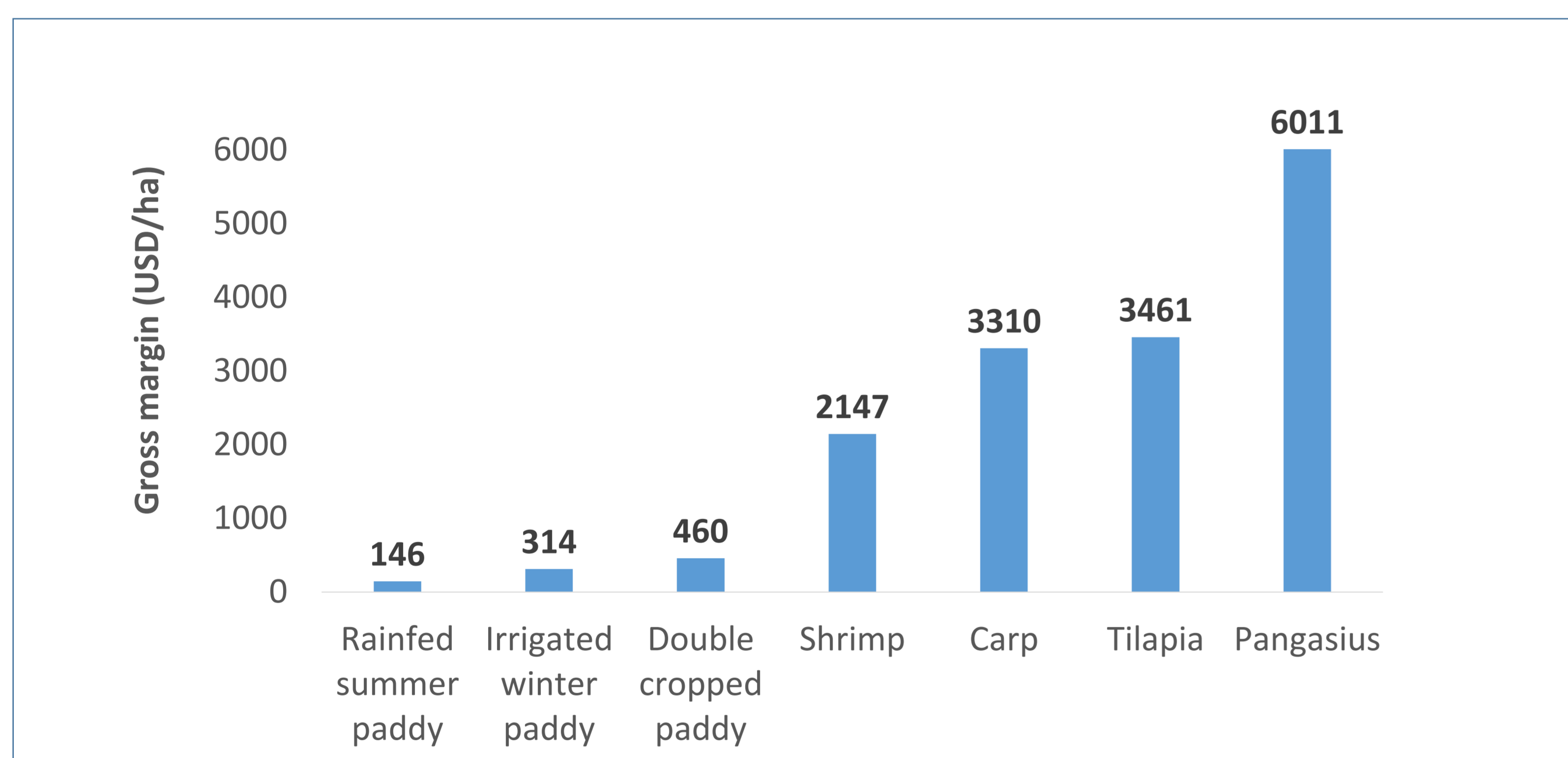
## Introduction

Rice and fish are the most important components of the diet in both Myanmar and Bangladesh: rice provides the majority of energy, and fish provides a major share of micro-nutrients. Optimal locations for farming fish are usually those best suited to cultivating rice, and most fish ponds in both countries are constructed on converted paddy land.

In both countries, food security has historically been equated with rice self-sufficiency, and rice has been placed at the center of food security policy. In Bangladesh aquaculture has been promoted heavily through long term development investments and a supportive policy environment. In contrast, Myanmar prohibits conversion of paddy land to other uses; Bangladesh has no such restrictions. Both countries are currently self-sufficient in rice production.

Profit margins from aquaculture are far greater than those possible from paddy cultivation (Figure 1). Smallholder diversification out of cultivation of staple crops into higher value agricultural enterprises is vital for promoting rural growth and in ensuring food and nutrition security, as non-staple foods account for increasingly large shares of food expenditures.

This poster compares the area of land devoted to paddy cultivation and aquaculture in both countries, to make the case for removing restrictions on agricultural land use in Myanmar.



**Figure 1. Gross margin/ha from paddy and aquaculture in Bangladesh**

(Source: IFPRI 2013; Jahan et al, in prep)

## Results

Bangladesh is the fifth largest aquaculture producer globally, while Myanmar occupies 10<sup>th</sup> position (FAO, 2014). Most fish farmed in Bangladesh is produced by commercially oriented smallholders. In Myanmar the majority of fish originates from very large farms (>100 ha). Bangladesh devotes four times more land to fish ponds (371,00 ha, versus 89,200 ha), and produces two times more farmed freshwater fish (1.52 million t, versus 0.82 million t) than its neighbour (Table 1).

The area of land cultivated with paddy in Myanmar has grown much more rapidly than in Bangladesh over the last decade (expanding at 4.3% per annum, versus 0.9%), but rice yields in Bangladesh grew faster than in Myanmar (2.7% per annum, versus 1.2%) (Table 1). Although officially reported paddy yields are similar in Myanmar and Bangladesh (4.05 t/ha versus 4.34 t/ha), alternative estimates suggest that paddy yields in Myanmar average just 2.7 t/ha (Hagglade et al, 2014).

**References:** Ahmed, A.U., Ahmad, K., Chou, V., Hernandez, R., Menon, P., Naeem, F., Naher, F., Quabili, W., Sraboni, E., and Yu, B. 2013. *The Status of Food Security in the Feed the Future Zone and Other Regions of Bangladesh: Results from the 2011–2012 Bangladesh Integrated Household Survey*. Dhaka, International Food Policy Research Institute. FAO. 2014. *The State of World Fisheries and Aquaculture 2014*. FAO Fisheries and Aquaculture Department. Rome: Food and Agriculture Organization of the United Nations. Hagglade, S., Boughton, D., Cho, K.M., Denning, G., Kloeppinger-Todd, R., Oo, Z., Sandar, T.M., Than, T.M., Wai, N.E.M.A., Wilson, S., Win, N.W., Wong, L.C.Y. 2014. Strategic Choices Shaping Agricultural Performance and Food Security in Myanmar. *Journal of International Affairs*. 67(2):55-71. Jahan, K.M., Belton, B., Ali, H., Dhar, G.C., Ara, I. In prep. *Aquaculture Technologies in Bangladesh: A comprehensive assessment of technical and economic performance and producer behavior*. Dhaka: WorldFish.

The two countries have pursued different strategies for increasing paddy production:

- In Myanmar, production increases have been achieved in part through horizontal expansion, often by granting land concessions to companies, and 85% of rice production remains rainfed.
- In Bangladesh, production increases have resulted from smallholder-led intensification (widespread double cropping with HYVs, facilitated by private groundwater irrigation)

	Rice Area ('000 ha)		Rice Area Growth	Fish Area ('000 ha)		Fish Area Growth	Fish Pond/Rice Area	
	2003/4	2009/10	2004-10	2003/4	2012/13	2003-13	2003/4	2013 (2010)
<b>Myanmar</b>	6543.1	8066.8	4.3%	62.9	89.6	4.0%	0.010	0.011
	2001/2	2010/11	2002-11	2001/2	2010/11	2001-11	2001/2	2010 (2011)
<b>Bangladesh</b>	10660.7	11529.1	0.9%	291	371	2.8%	0.027	0.032

**Table 1. Paddy and fish pond area, and fish pond area as a share of paddy area in Myanmar and Bangladesh**

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 just 1.1% of paddy area. For Bangladesh, the respective figure is 3.2%.

Although rapid expansion of pond area and fish production occurred in both countries over the last decade, the ratio of inland aquaculture land to paddy land increased just 0.01% on Myanmar, and by 0.05% in Bangladesh, due to concurrent increases in paddy area (Table 1)

## Conclusions

Commercial aquaculture is a high value activity, yielding much higher returns than paddy cultivation, can be viable at small/medium scale, and makes important contributions to food and nutrition security goals.

Aquaculture in Myanmar has grown quickly despite an unfavorable policy environment which increases the cost of adoption and, in some areas, prevents it completely. This is a testament to how attractive it is to farmers.

The potential loss of rice area to aquaculture resulting from liberalizing land use restrictions in Myanmar 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 a current 1.1% equivalent share of rice area to just 3.2%. This implies a decrease in rice area and production of 2.1%, or less.

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 confiscation of land for large scale agricultural projects;
- Avoid the environmental impacts of further expansion of the land frontier

Reductions in paddy production caused by conversion of rice land to ponds could easily be made up through greater efficiencies, raising Myanmar's rice yields closer to levels to those achieved by its neighbors. Rice security and fish security is not a necessarily zero sum game: more fish doesn't have to mean less rice!