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Delivering for Nutrition in South Asia
Equity and Inclusion
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Integrated aquatic and terrestrial food production enhances micronutrient and economic productivity for nutrition-sensitive food systems

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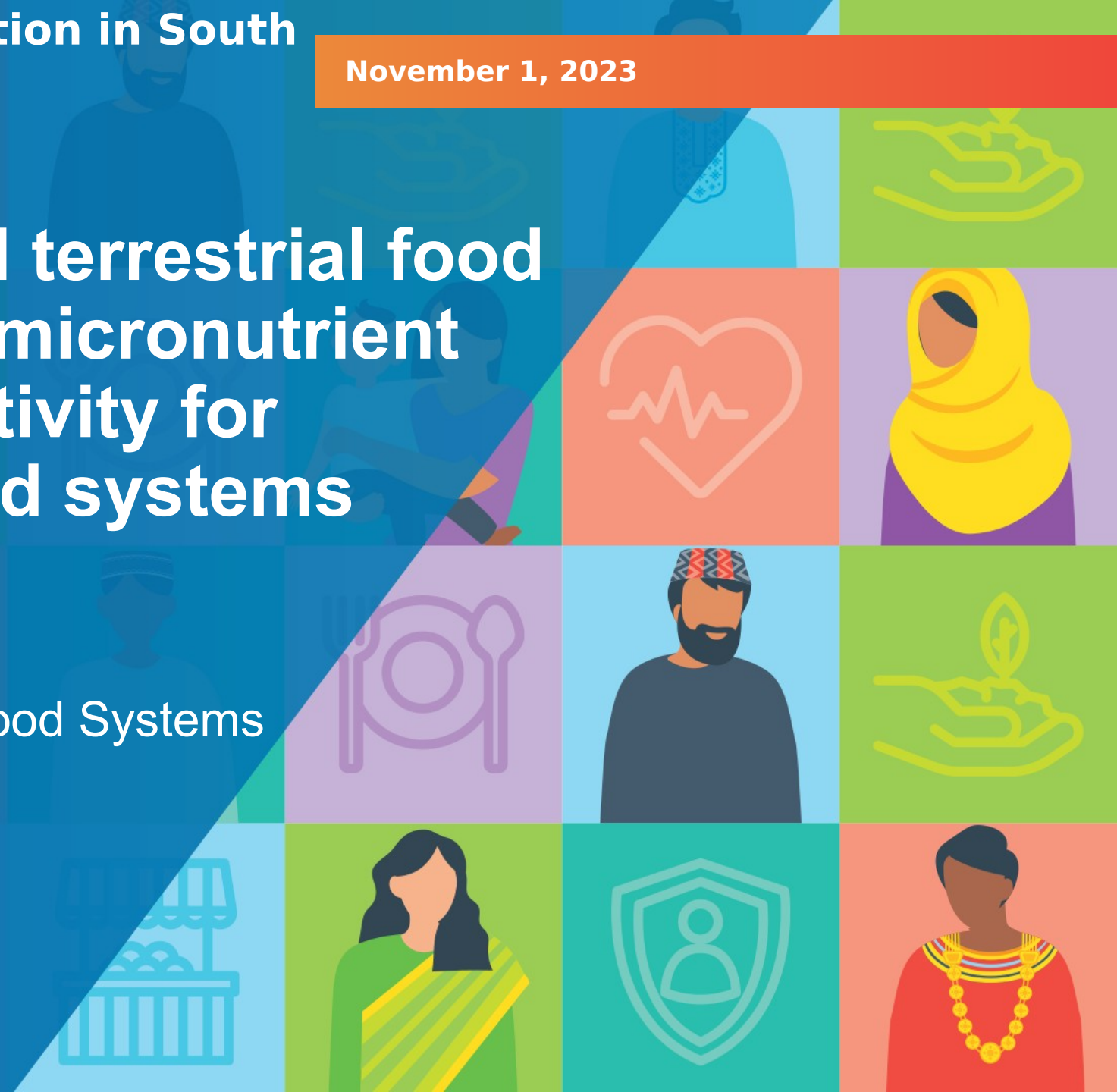
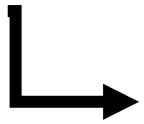


Background

- **<u>Nutrition-sensitive agriculture (NSA):</u>** Programs to address the underlying causes of malnutrition

- **<u>Why the recent push for NSA programs?</u>**
- Triple burden of malnutrition persisted even after green revolution

- A key component of NSA is *crop diversification*



<u>Improved diets and nutrition</u>

- NSA within **aquaculture** → Integrated aquaculture-agriculture (IAA)

Setting

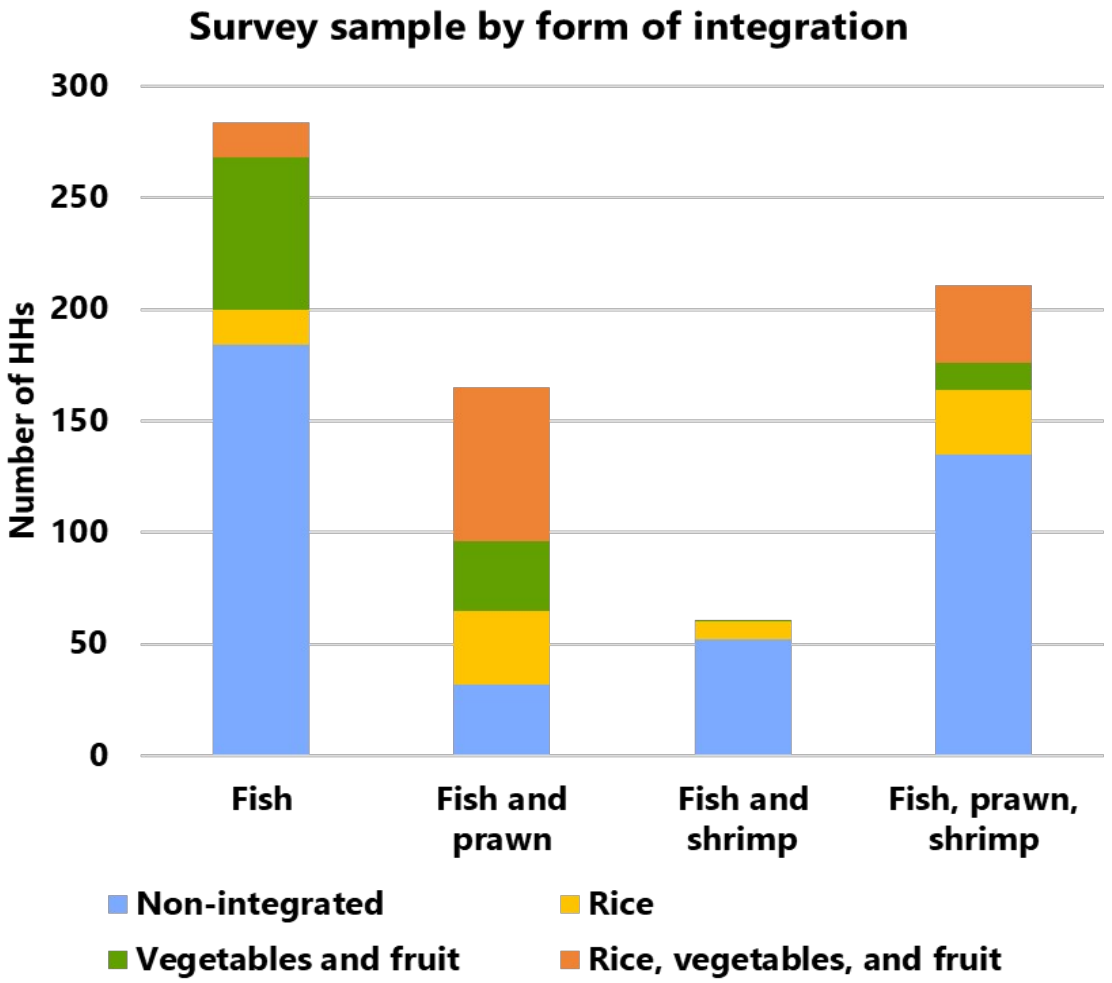
- Bangladesh: IAA is common
- →limited research on whether these practices improve productivity of micronutrients

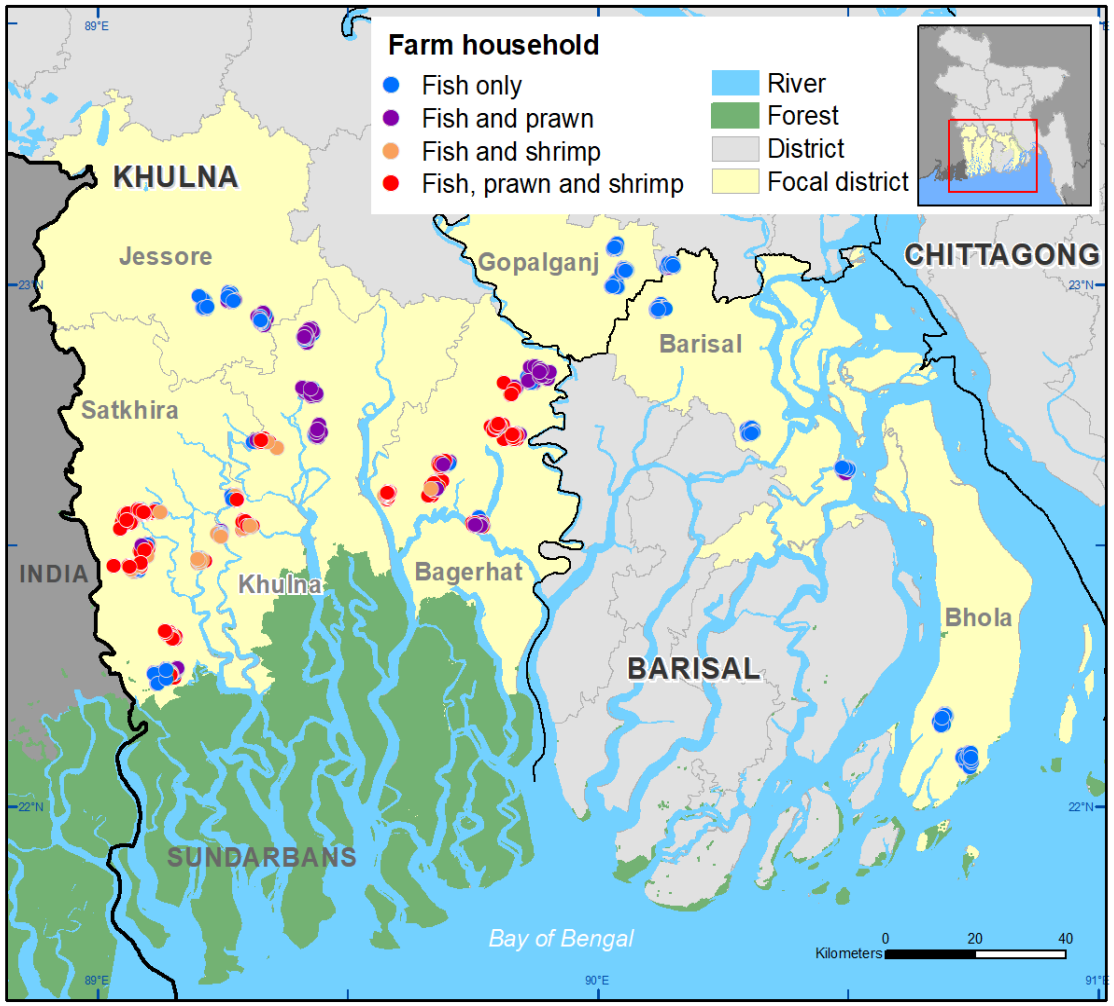
- **RQ:** What is the nutritional and economic productivity of different integrated farming systems?

- **Data sets:**

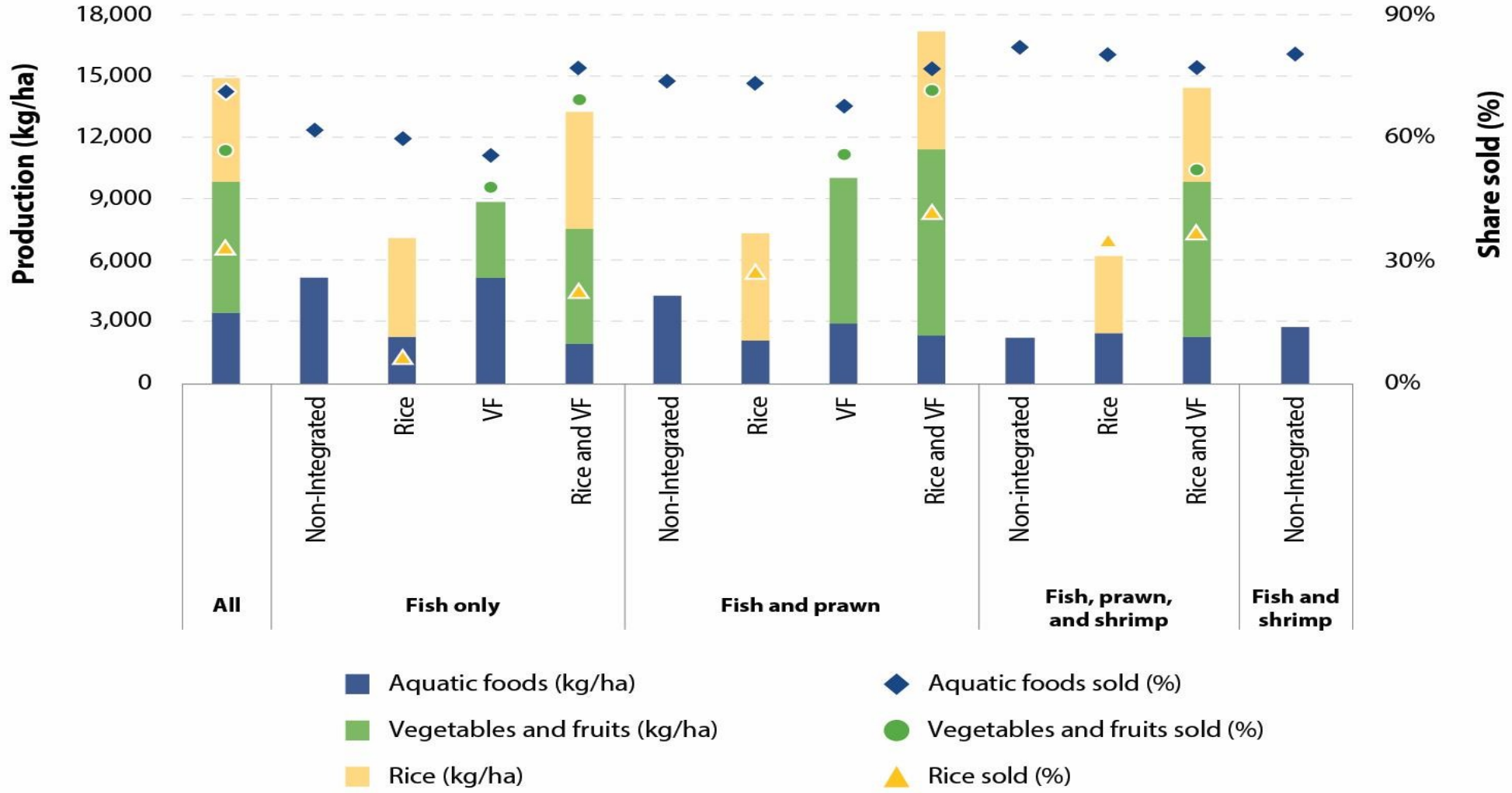
- Fish Innovation Lab, collected December 2020 and January 2021
  - Production amounts and value per sample pond
- Bangladesh Food Composition Tables

Survey sample

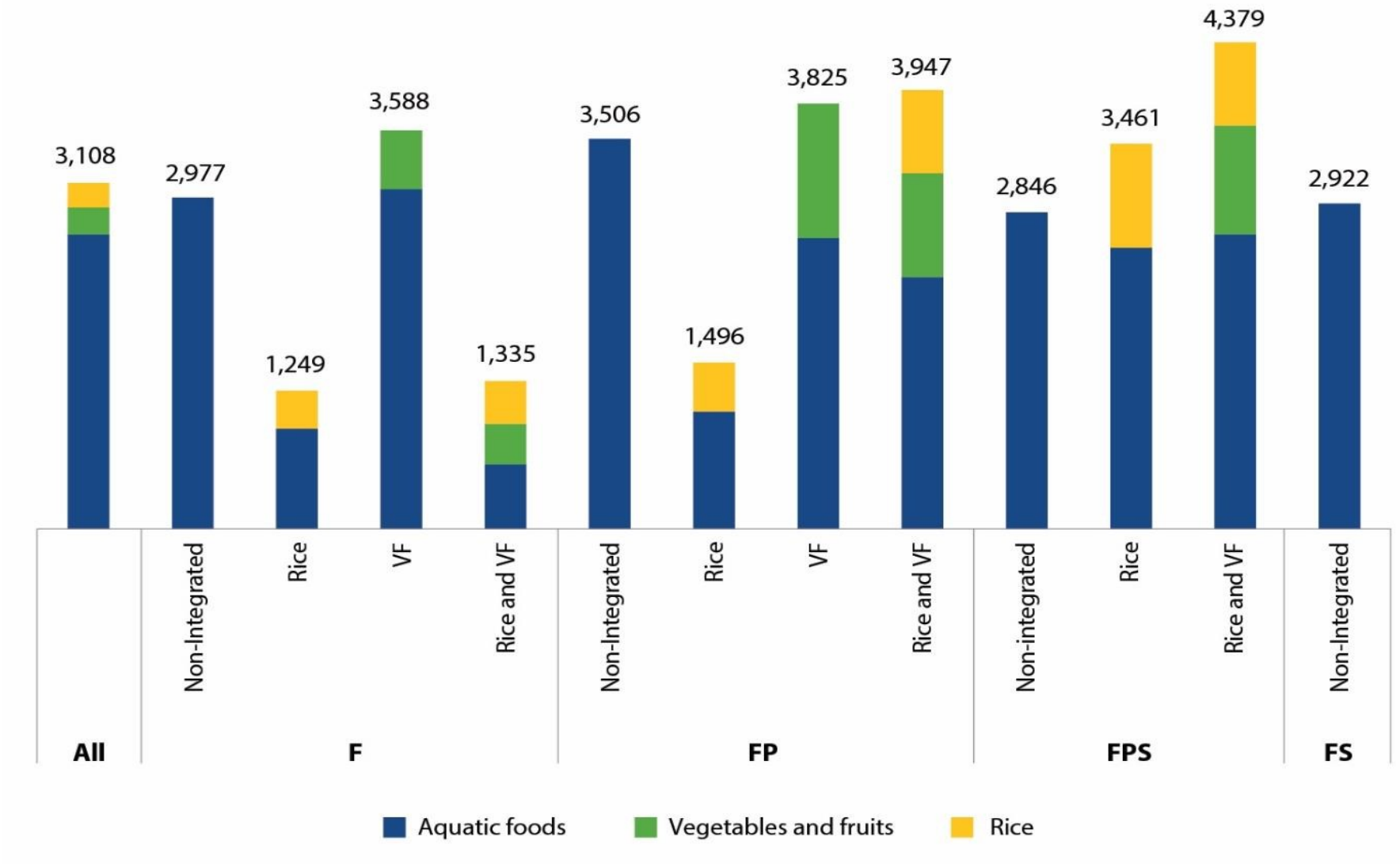




Average quantities of foods produced/ha and shares sold for each food group in each farming system



Economic productivity (USD/ha) by farming system



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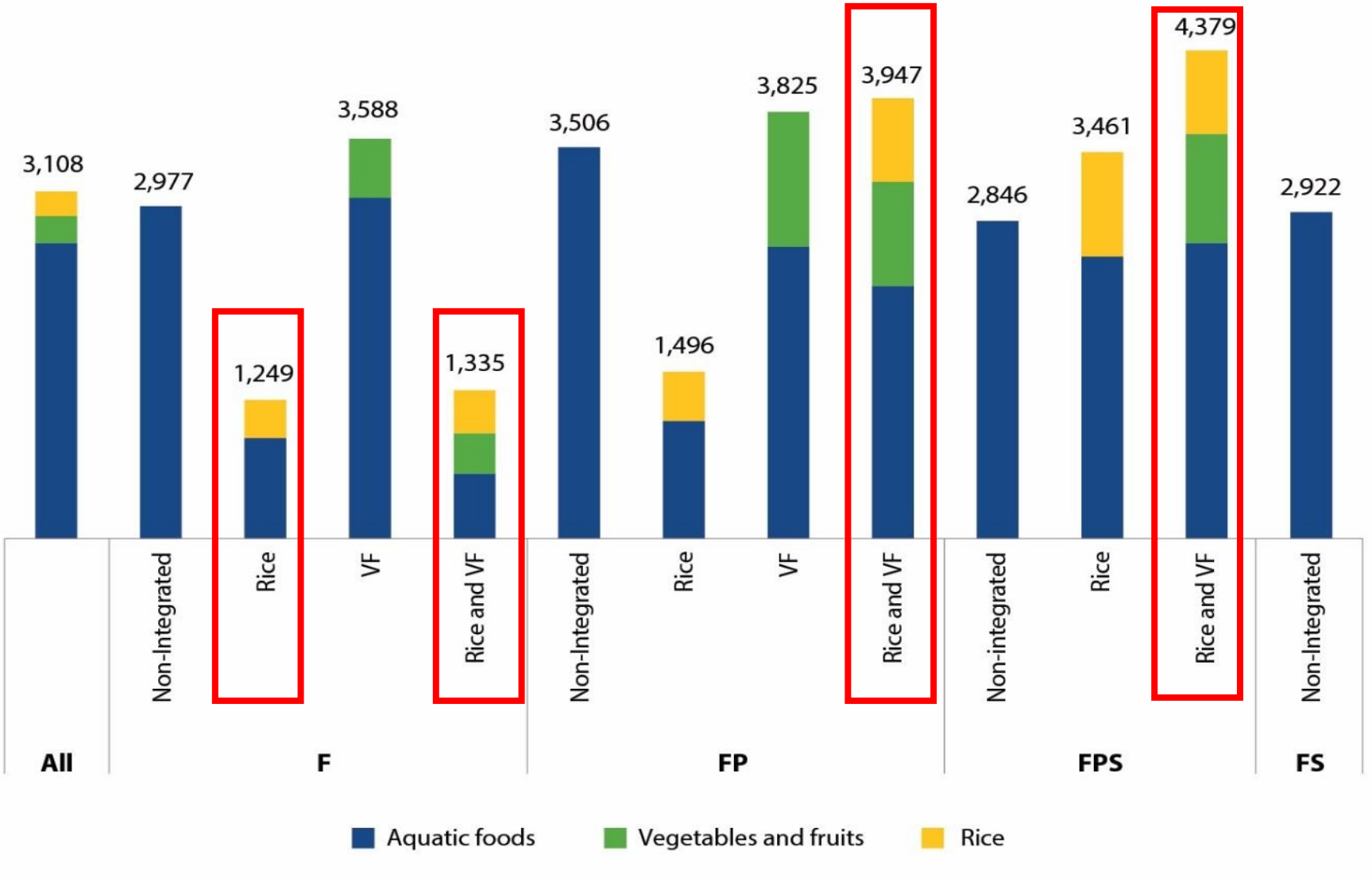
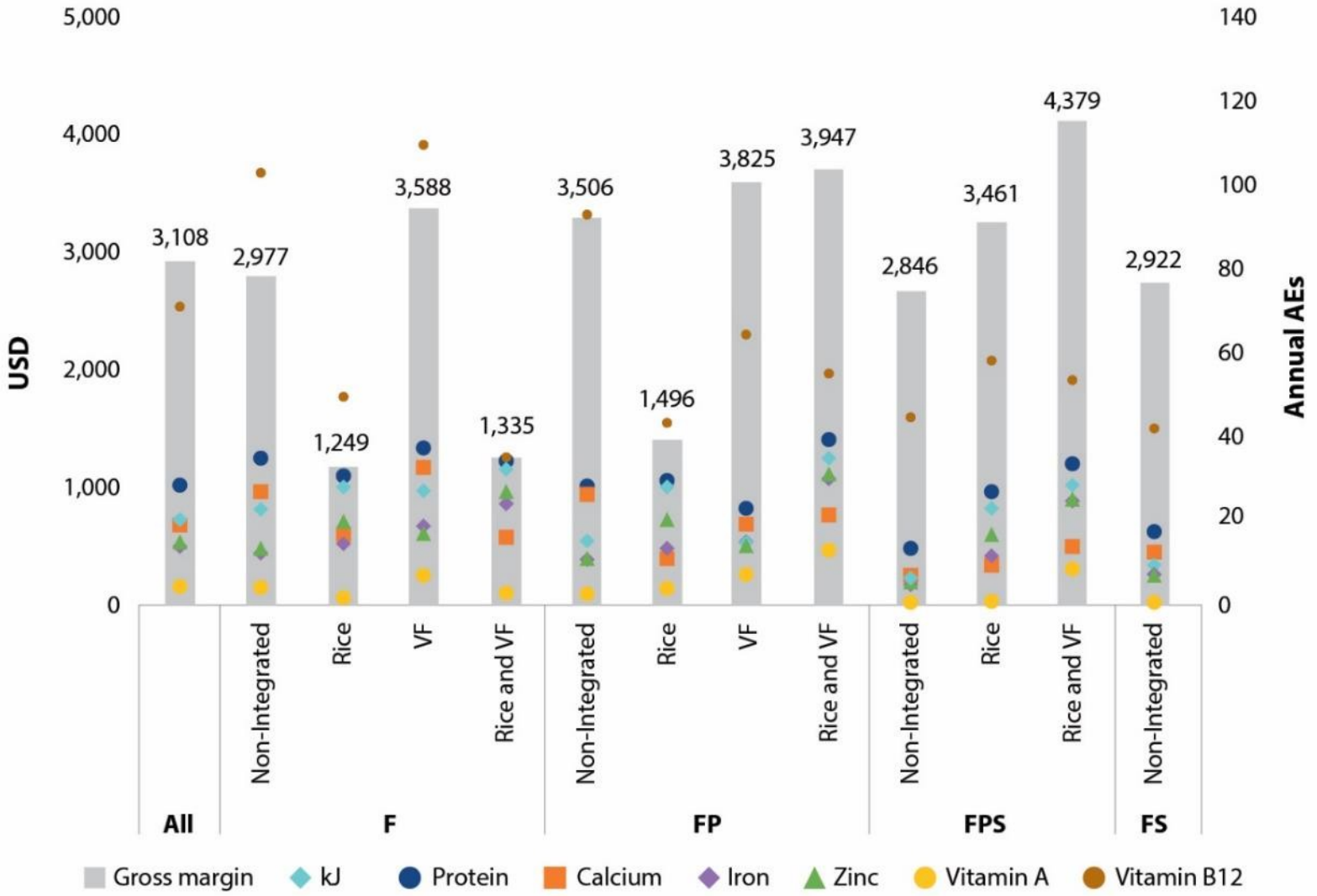


Economic productivity and estimates of nutrient productivity by farming system



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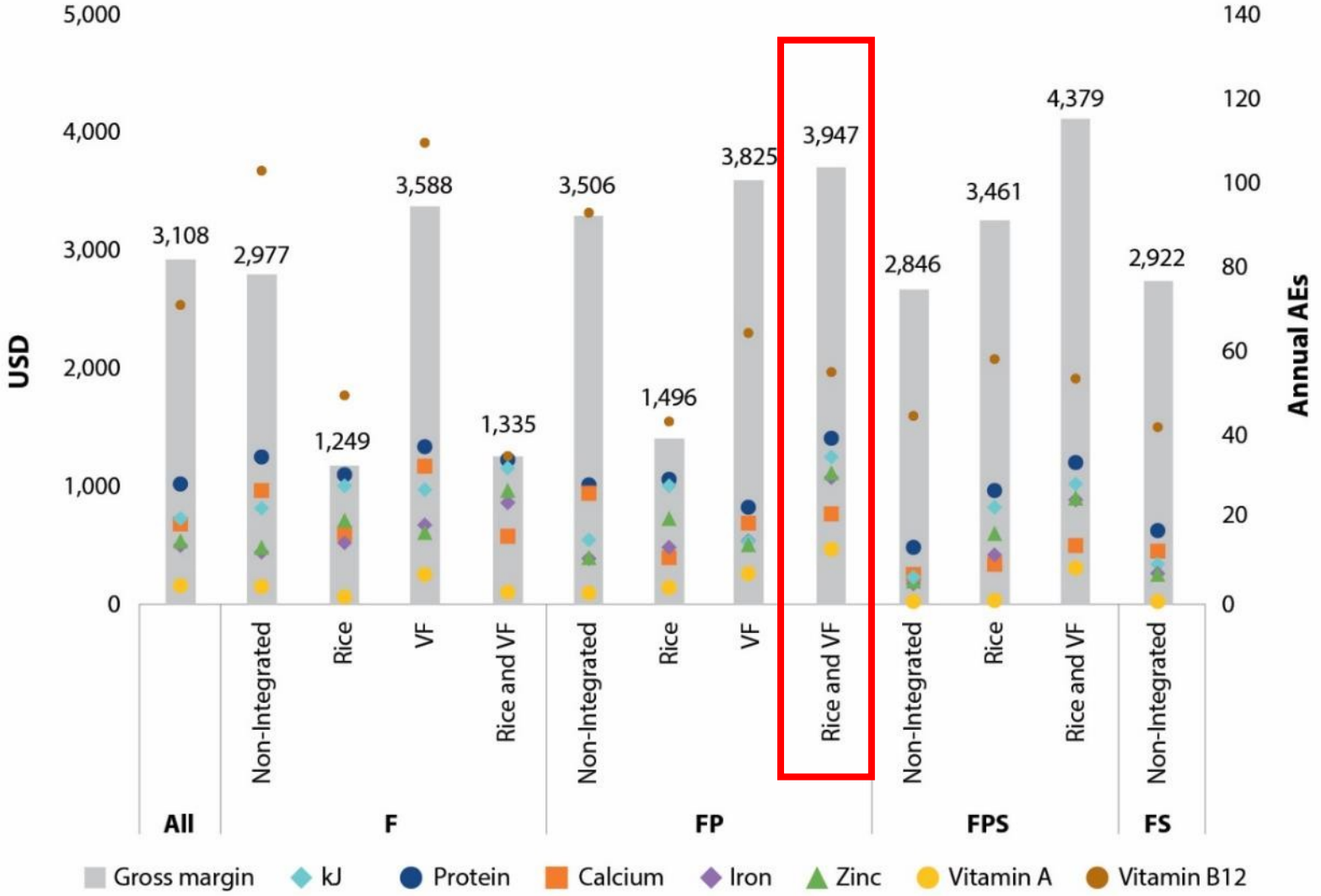

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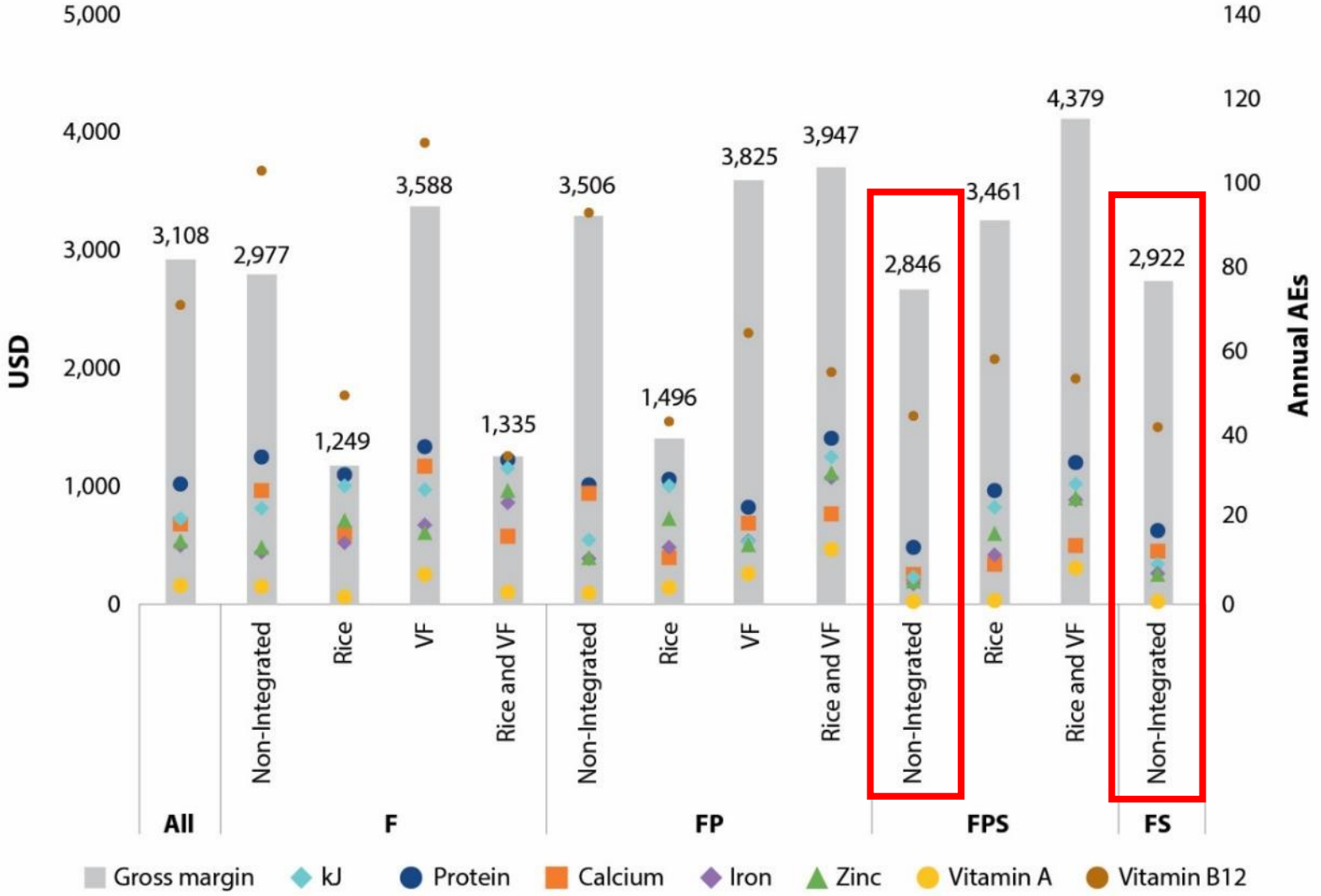

OLS regression analysis: correlates of economic and nutrient productivity

Production (t/ha)	Economic productivity (USD/ha)	kJ (AEs/ha)	Protein (AEs/ha)	Calcium (AEs/ha)	Iron (AEs/ha)	Zinc (AEs/ha)	Vitamin A (AEs/ha)	Vitamin B12 (AEs/ha)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Carp	**1387.3*** **	3.5***	**7.3*** **	**6.5*** **	2.6***	2.9***	0.2*	**25.6*** **
	(60.8)	(0.1)	(0.0)	(0.3)	(0.1)	(0.1)	(0.1)	(1.2)
Other stocked fish	**438.1*** **	**7.2*** **	**7.1*** **	2.4***	1.8***	2.0***	1.1***	**21.9*** **
	(45.3)	(0.1)	(0.0)	(0.2)	(0.1)	(0.0)	(0.1)	(0.9)
Unstocked fish	-66.5	**4.6*** **	**7.7*** **	**12.5*** **	**5.0*** **	**4.2*** **	**3.7*** **	-1.3
	(369.4)	(0.8)	(0.3)	(1.7)	(0.7)	(0.4)	(0.7)	(7.4)
Crustaceans	**3944.3*** **	0.8**	5.0***	0.8	2.2***	2.4***	-0.3	**30.1*** **
	(166.7)	(0.4)	(0.1)	(0.8)	(0.3)	(0.2)	(0.3)	(3.3)
Rice	47.7	**4.4*** **	3.4***	0.4	2.0***	3.1***	0	0.4
	(80.1)	(0.2)	(0.1)	(0.4)	(0.1)	(0.1)	(0.1)	(1.6)
Leafy vegetables	64.6	-0.3	1.8***	3.3	**3.4*** **	**3.3*** **	**10.4*** **	0.9
	(563.5)	(1.3)	(0.4)	(2.6)	(1.0)	(0.5)	(1.0)	(11.2)
Vit. A-rich vegetables	336.1***	0	0.6***	1.3***	1.1***	0.2**	**8.9*** **	0
	(106.8)	(0.2)	(0.1)	(0.5)	(0.2)	(0.1)	(0.2)	(2.1)
Other vegetables	142.7***	0.3***	0.6***	0.3**	1.3***	0.9***	0.3***	-0.1
	(26.1)	(0.1)	(0.0)	(0.1)	(0.0)	(0.0)	(0.0)	(0.5)
Nuts/oilseeds	414.1**	3.8***	2.0***	**5.7*** **	**6.7*** **	1.6***	1.5***	3.4
	(161.7)	(0.4)	(0.1)	(0.7)	(0.3)	(0.2)	(0.3)	(3.2)

OLS regression analysis: correlates of economic and nutrient productivity

Production (t/ha)	Economic productivity (USD/ha)	kJ (AEs/ha)	Protein (AEs/ha)	Calcium (AEs/ha)	Iron (AEs/ha)	Zinc (AEs/ha)	Vitamin A (AEs/ha)	Vitamin B12 (AEs/ha)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Carp	**1387.3*** **	3.5***	**7.3*** **	**6.5*** **	2.6***	2.9***	0.2*	**25.6*** **
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Conclusion

- Production of specific combinations of aquatic foods and vegetables can simultaneously improve nutrient productivity and economic productivity, thereby promoting nutrition-sensitive agriculture (NSA)

- Increasing production diversity is not necessarily the most effective path to improving diet diversity
    - Income is another pathway (esp. for HHs affected by salinity)

Future research

- Identify and promote specific crop combinations that maximize economic and nutrient output for a given level of salinity

Acknowledgment

- The Feed the Future Innovation Lab for Fish, through the United States Agency for International Development (**USAID**)

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