

# The Status of Aquaculture in Myanmar:

## A review of existing data

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# Outline

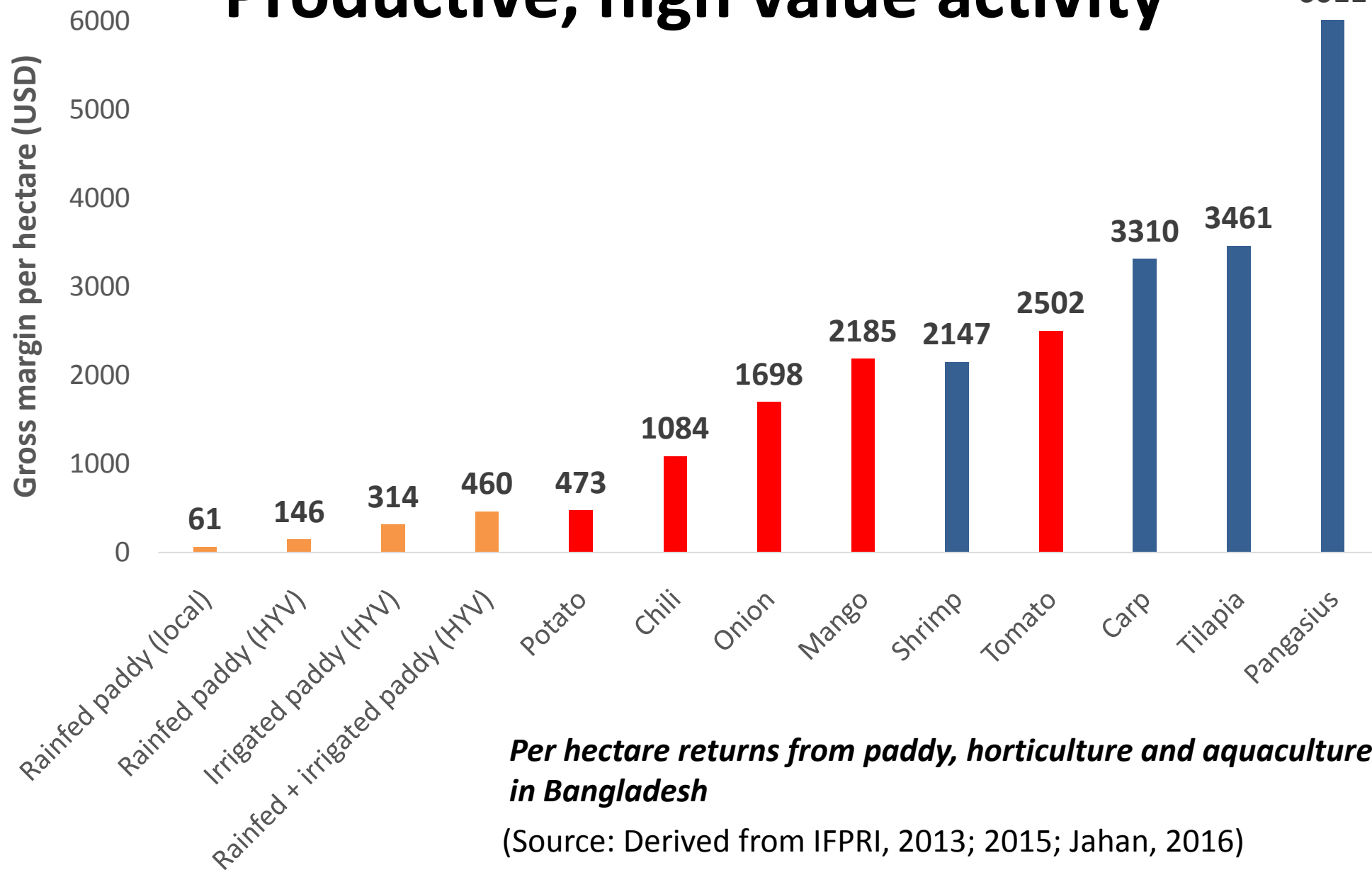
- Why focus on aquaculture?
- Conventional Wisdom (literature review)
- Fish Consumption and Price Data  
(IHLCA 2010 and CSO)
- Production and Trade  
(CSO, DOF, FAO)
- Spatial Analysis of Pond Area  
(Google Earth Pro)



# Why focus on aquaculture?

- Fish is crucial to food and nutrition security in many of the world's least developed countries – often *the* major source of micronutrients
- Demand for fish increasing in line with rising incomes and urbanization, shift from staples to higher value foods
- Global capture fisheries output growth stagnant
- Aquaculture is fastest growing food sector globally, providing half the world's food fish, set to grow 35% by 2022 to 85 million t (OECD/FAO, 2013)
- Fish farming is a high value agricultural activity

# Productive, high value activity



***Per hectare returns from paddy, horticulture and aquaculture in Bangladesh***

(Source: Derived from IFPRI, 2013; 2015; Jahan, 2016)



# The conventional wisdom on Myanmar's aquaculture

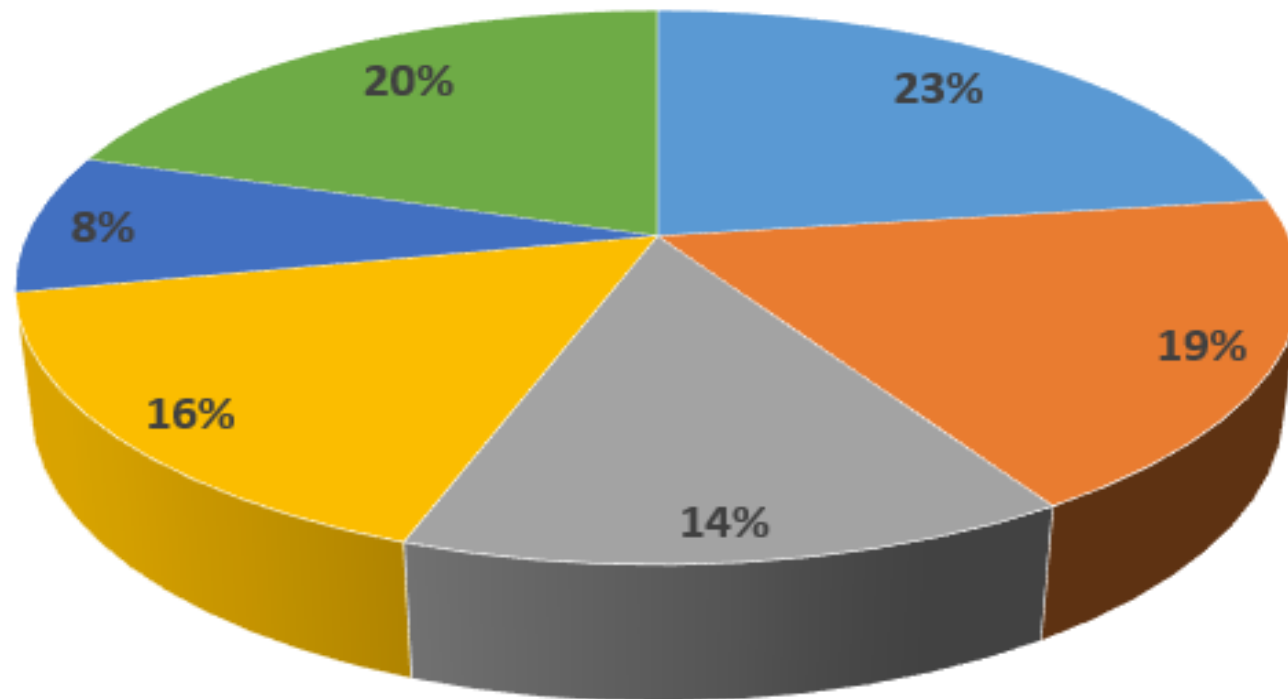
- Large-scale farm dominated
- No small-scale producers
- Impossible to construct ponds on paddy land
- Export oriented
- Low productivity and technical efficiency
- Limited employment generation

# Fish Consumption





# Household Food Expenditure Budget Shares



■ Rice and other staples

■ Fish

■ Food & beverages taken outside home

■ Meat, eggs & milk

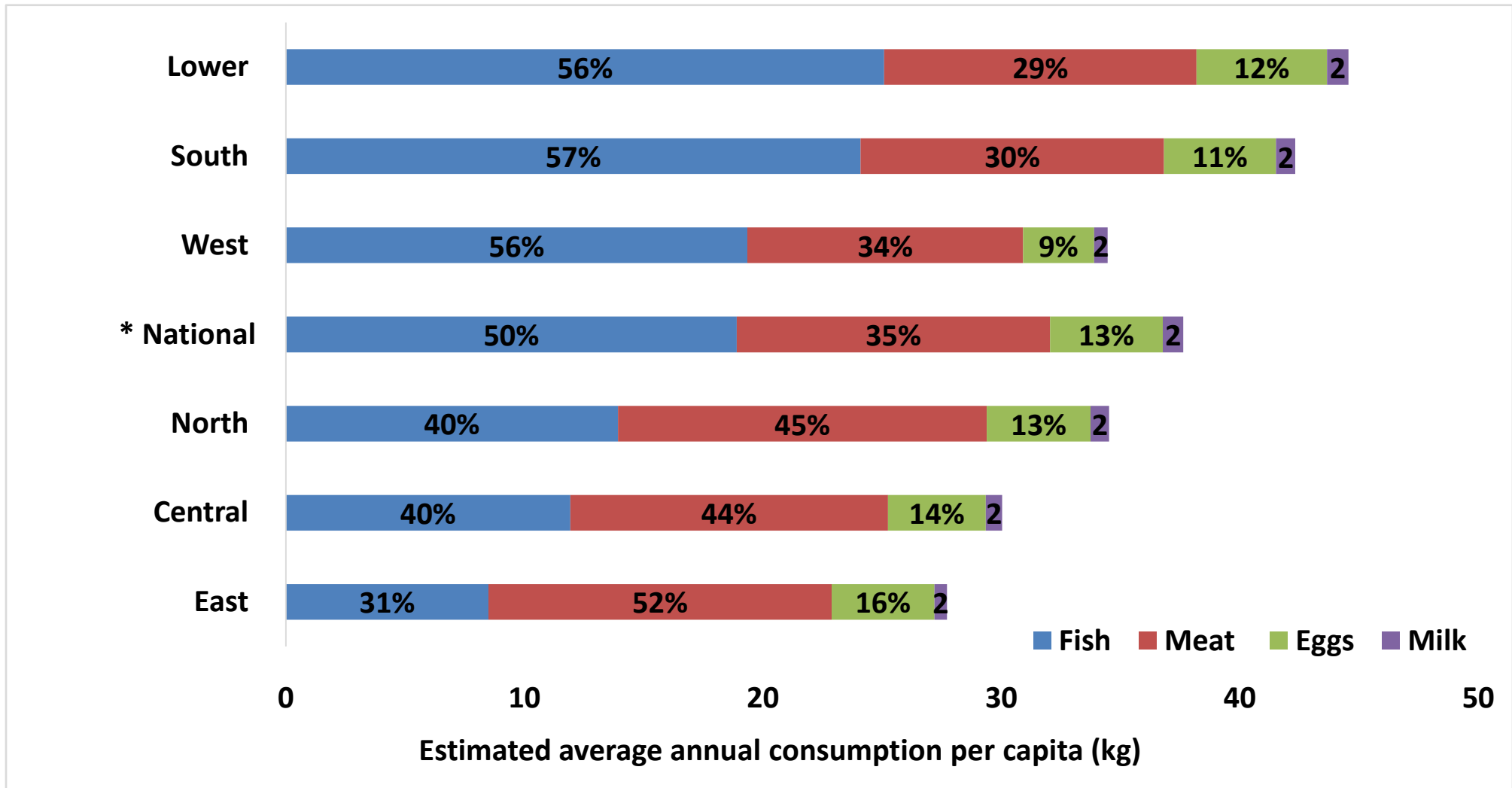
■ Vegetables & fruits

■ Other foods & beverages

***Share of national food expenditure by food group (%)***

(Source: Authors' calculations from IHLCA 2010 dataset)

# Fish's contribution to consumption of animal source foods



***Myanmar estimated average annual consumption of animal source foods per capita, by location*** (Source: authors' calculations from IHLCA 2010 dataset)



# Rural and Urban Fish Consumption

	Average fish consumption (kg/capita/year)				
	Aquaculture	Dried/ processed	Fresh-water capture	Marine capture	All fish
National	3.9	6.4	5.1	3.5	18.9
Rural	3.5	6.5	5.5	3.3	18.7
Urban	5.0	6.3	4.0	4.1	19.4
Urban – Rural Difference (%)	41	-2	-27	25	3

***Average consumption of fish by source and location***

(Source: Author's calculations from IHLCA dataset 2010)



# Fish consumption by economic status

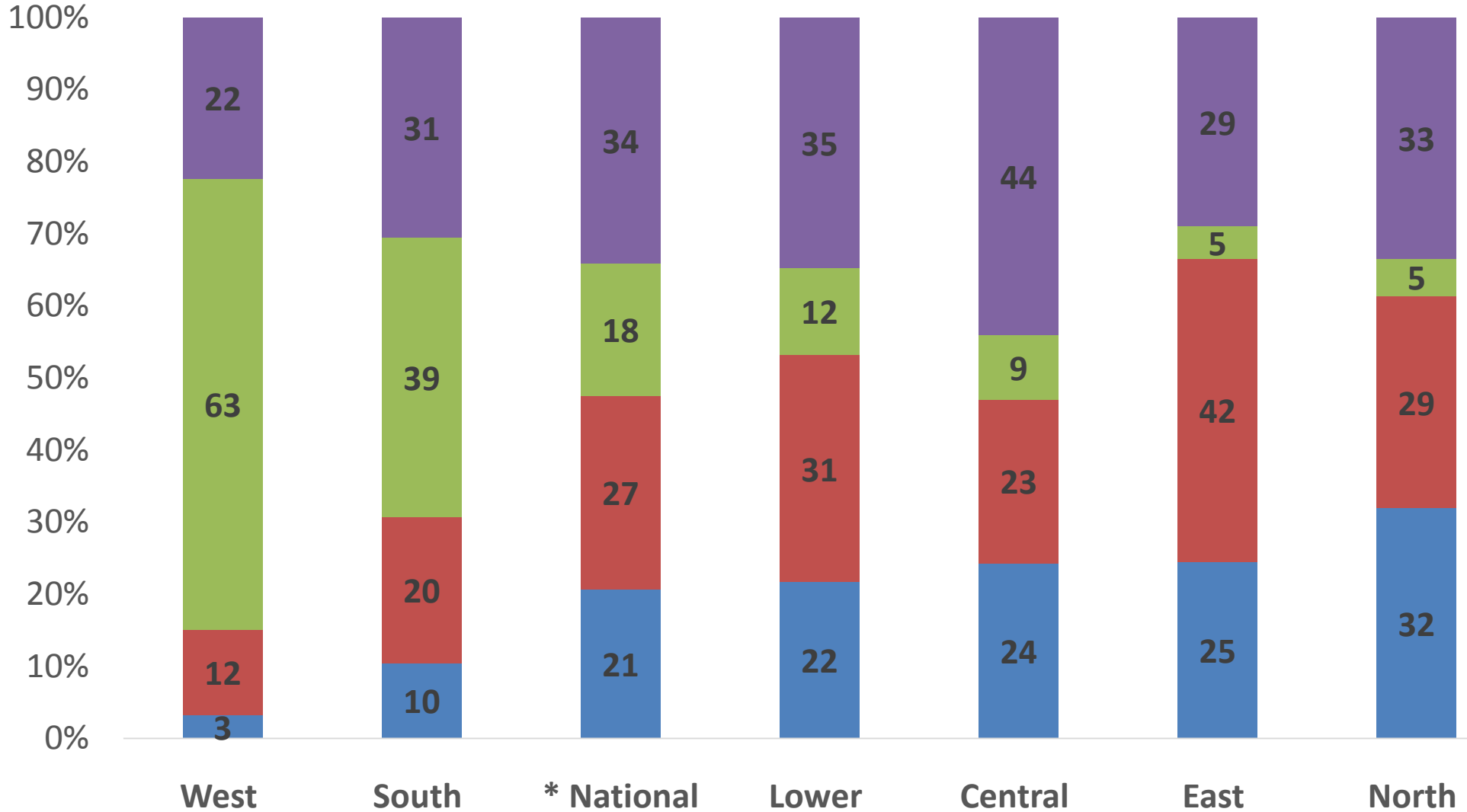
	Average fish consumption (kg/capita/year)				
	Aquaculture	Dried/ processed	Fresh- water capture	Marine capture	All fish
Quintile 1	1.6	4.2	4.3	3.0	13.0
Quintile 2	3.2	5.8	4.6	3.0	16.6
Quintile 3	4.1	6.4	4.8	3.1	18.4
Quintile 4	4.9	7.3	5.3	3.8	21.2
Quintile 5	5.5	8.3	6.3	4.4	24.5
Q5-Q1 Difference (%)	253	98	47	45	88
Consumption increase per quintile (%)	34.4	17.3	9.5	10.1	16.2

***Average consumption of fish by source and expenditure quintile***

(Source: Author's calculations from IHLCA dataset 2010)

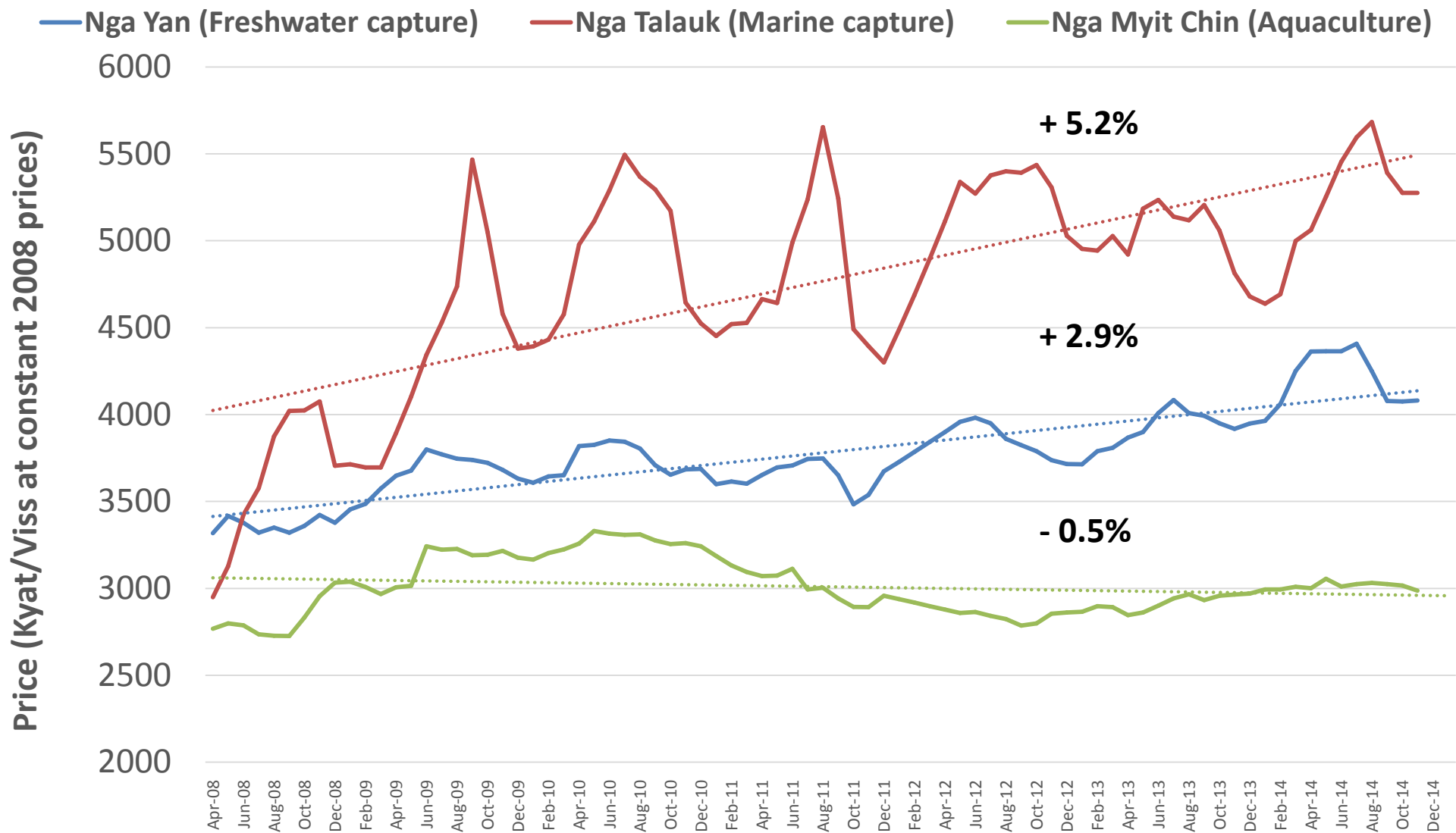
# Fish Consumption Geography

■ Aquaculture      ■ Freshwater capture  
■ Marine capture      ■ Dried/processed fish products



*Share of fish consumed by source and region* (Authors' Calculations from ILHCA- 2010)

# Historical Price Trends

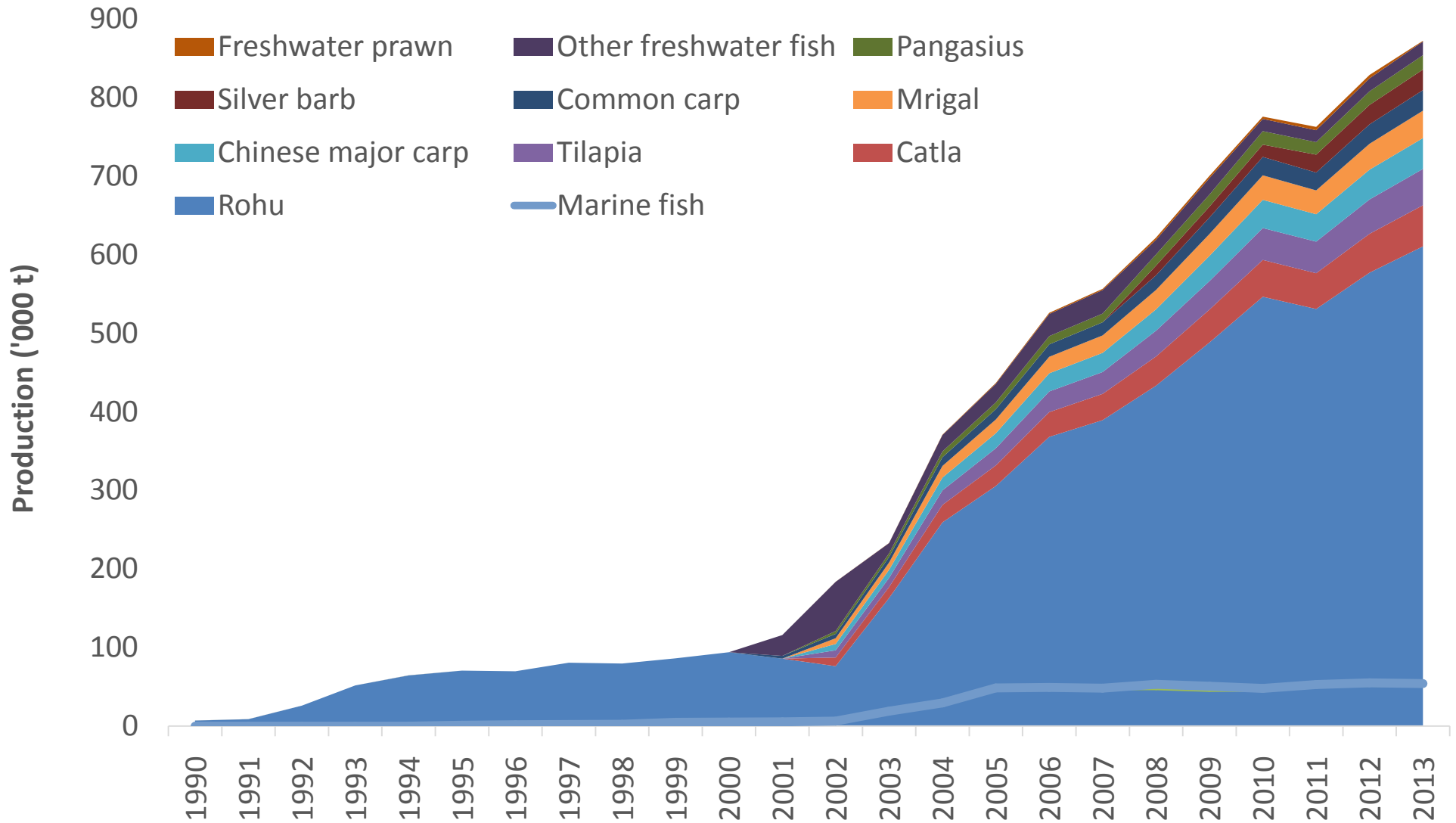


Real fish prices, May 2008-Jan 2015 (Source: CSO, various years)

# Fish Production and Trade

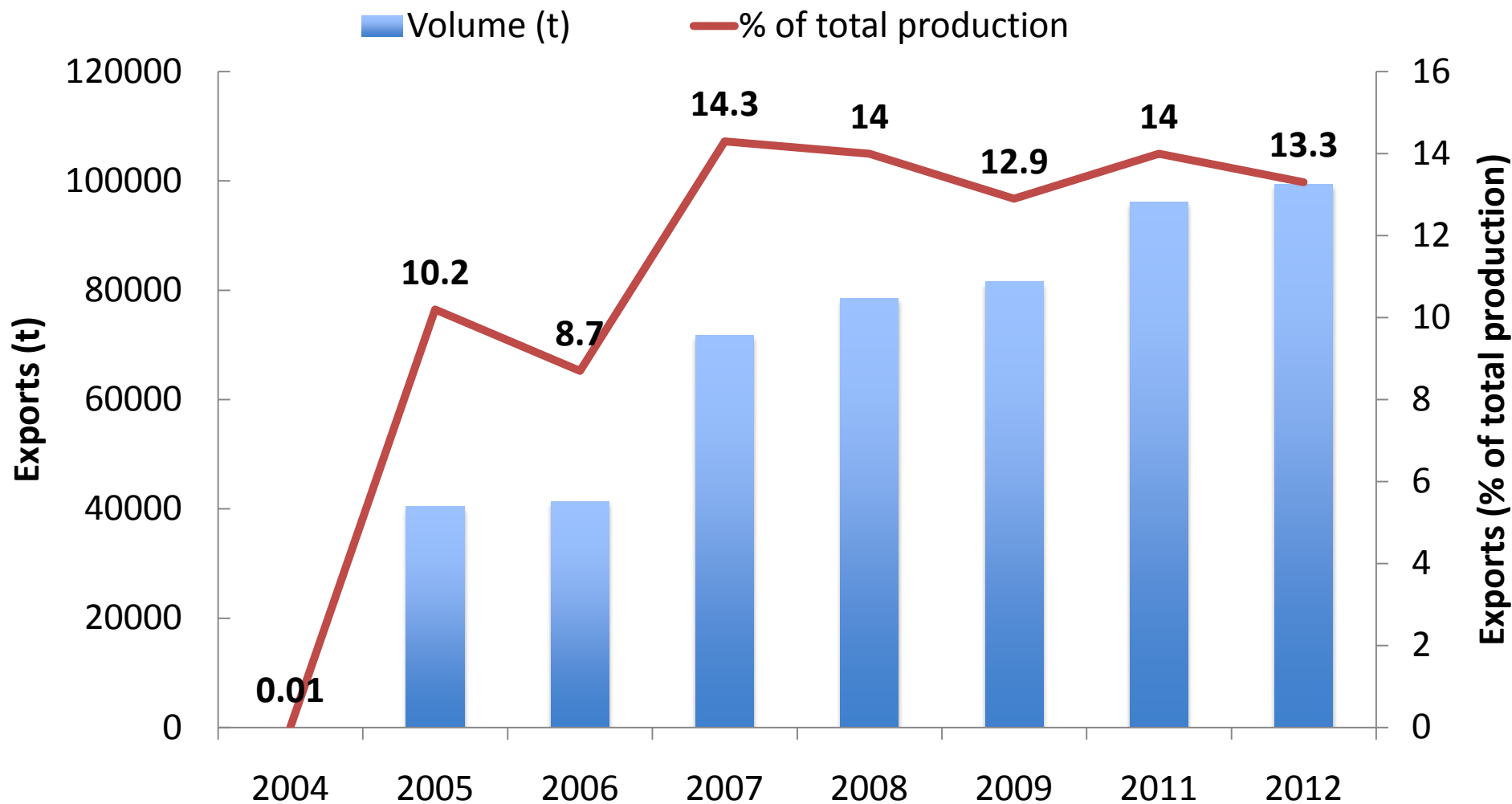


# Reported aquaculture production



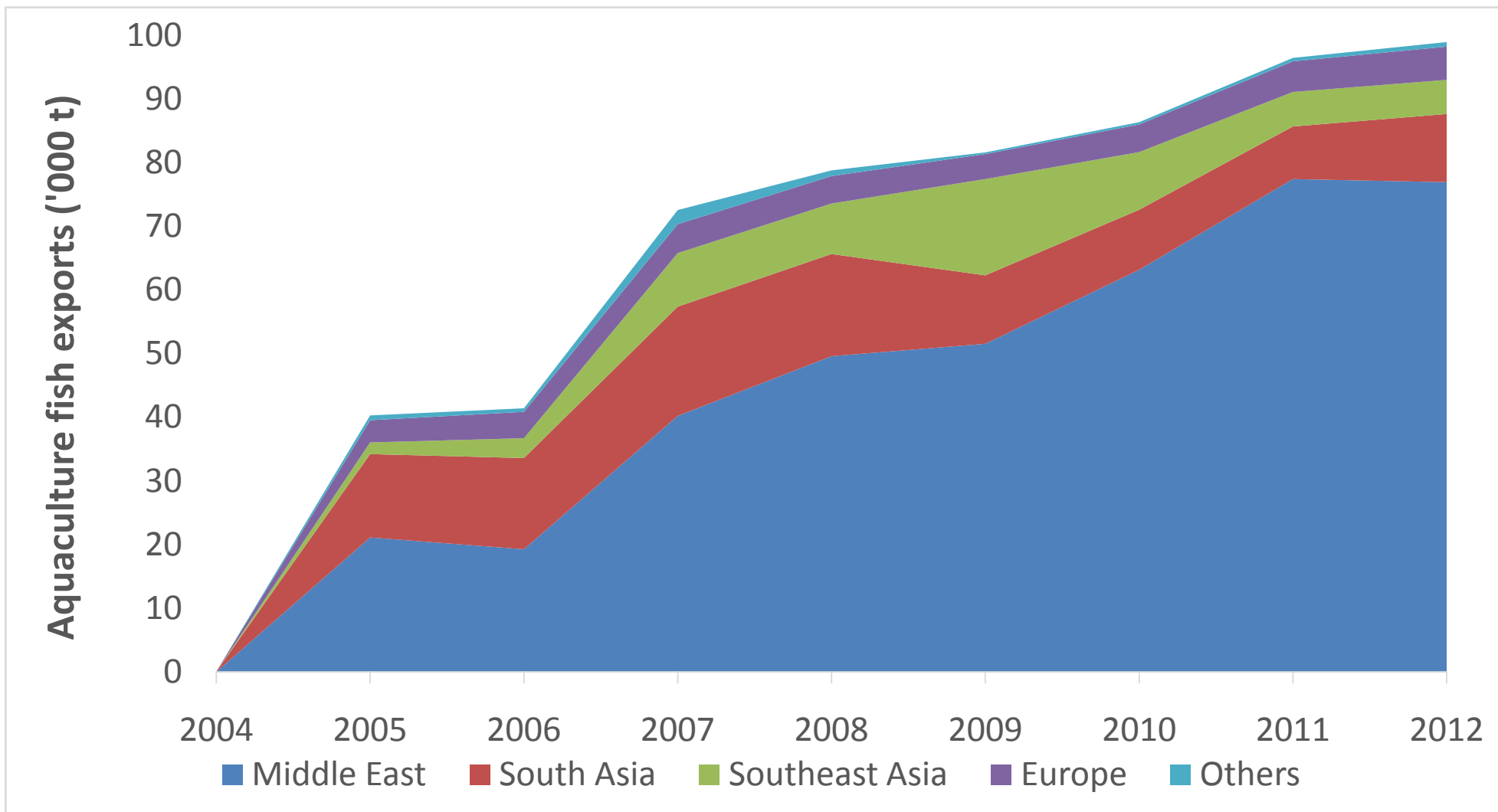
**Myanmar aquaculture production by species, 1990-2013** (Source: FAO, 2015)

# Freshwater Aquaculture Exports



**Myanmar Inland Aquaculture Exports by Volume and Share of Total Production (Source: derived from DOF, 2014)**

# Exports of farmed fish, by importing region



***Volume of freshwater aquaculture exports by importing region, 2004-2012***

(Source: CSO, 2010; DOF, 2012)



# Estimation of 2010 fish supply based on consumption and trade data

Source	Apparent production (t)	Officially reported production (t)	Difference (%)
Marine capture	923,150	2,060,780	123
Freshwater capture	524,341	1,002,430	91
Aquaculture	324,322	858,760	164
Total	1,771,813	3,921,970	121

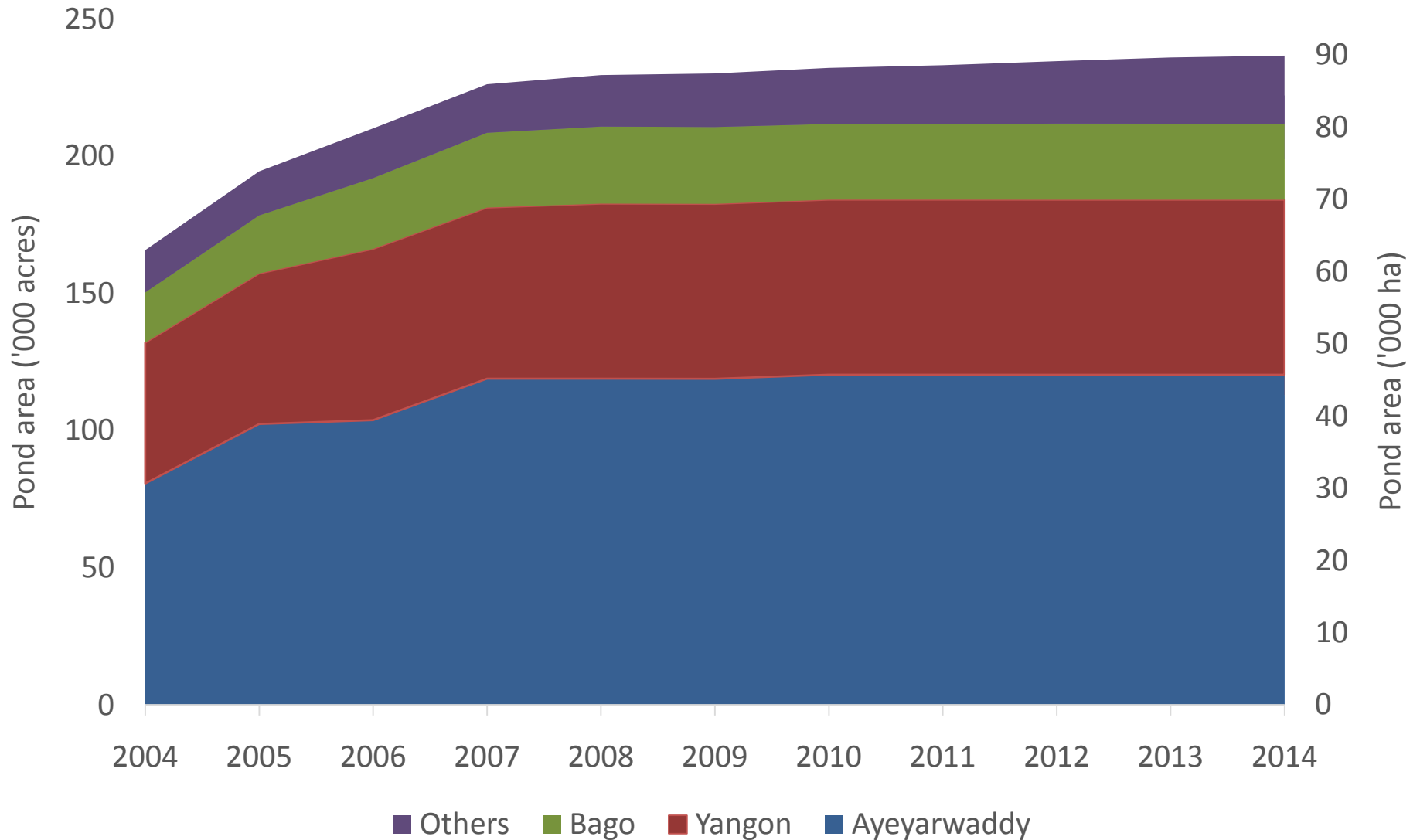
***Estimate of Myanmar's total fish supply in 2010, based on apparent consumption and exports*** (Source: Derived from DOF, 2012; 2014, IHLCA 2010)

An aerial photograph of a rural landscape, showing a dense grid of agricultural fields. The fields are separated by thin lines, likely roads or ditches. The colors of the fields vary, ranging from dark green to light green, suggesting different crops or stages of growth. A semi-transparent green overlay is applied to the entire image, creating a monochromatic effect. The text "Spatial Analysis" is centered in the image in a white, bold, sans-serif font.

# Spatial Analysis



# Reported fish pond area



**Myanmar inland fishpond area** (Source: DOF, 2014)

# Estimation of pond area and growth rates using satellite imagery

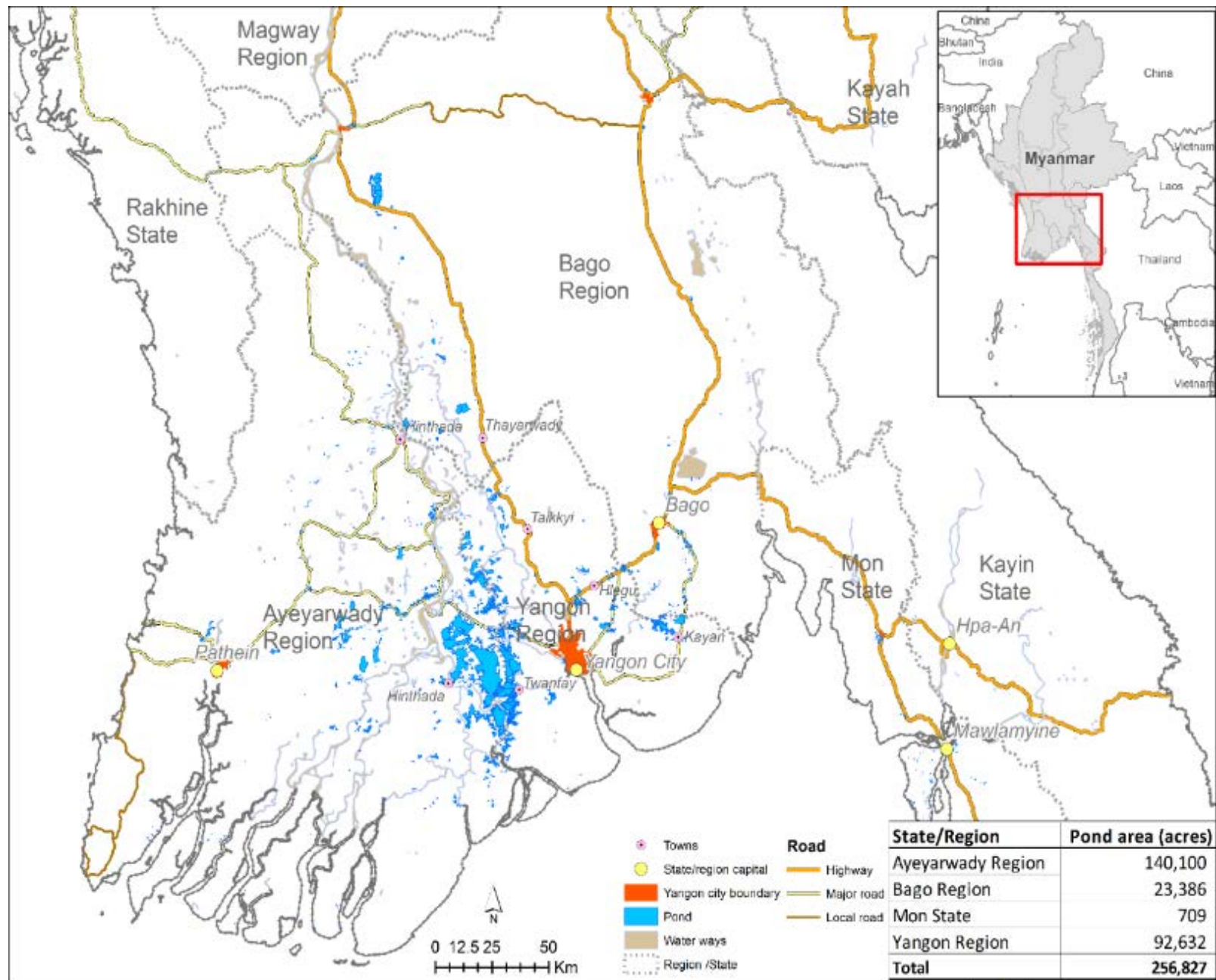


Item	Pond area (acres)	Number of ponds
<b>Hlegu Cluster (</b>		
2004	678	128
2009	1553	173
2014	1721	266
Change '04-'14 (%)	154	108
<b>"Nyaungdon Island" Cluster</b>		
2003	9698	994
2010	27663	1509
2014	34192	1736
Change '03-'14 (%)	253	75
<b>Latkyargyi Cluster</b>		
2003	2240	441
2014	3111	509
Change '03-'14 (%)	39	15

*Estimated spatial change in selected pond clusters*  
 (Source: Authors' calculations from Google Earth Pro)



# Spatial distribution of fish ponds in Lower Myanmar



(Source: Authors', derived from Google Earth satellite images)

# Gap between reported and GIS estimated pond area

Region/State	Pond area (Ha) Official	Pond area (Ha) Google Earth	Difference (%)
Ayeyarwady	45,705	56,721	24
Yangon	24,236	37,503	55
Bago	10,532	9,468	-10
<b>Sub-total</b>	80,868	103,978	<b>29</b>

## *Comparison of officially reported and estimated pond area*

(Source: Authors' own calculations from DOF, 2014; Google Earth Pro)



# Conclusions

- Triangulation of multiple data sources paints a picture of aquaculture that is much more complex than suggested by the conventional wisdom
- Fish is by far the most important animal source food consumed in Myanmar, and crucial source of micronutrients in the diet
- Aquaculture's contribution to fish consumption growing fast, and is especially important in urban areas and Upper Myanmar
- The real price of aquaculture fish is falling over time
- The growth of aquaculture has been driven mainly by the domestic market, not by exports
- Total fish production may be significantly lower than officially reported, but pond area has expanded rapidly over the last decade