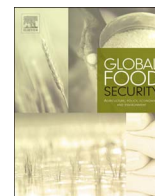




Contents lists available at ScienceDirect

Global Food Security

journal homepage: www.elsevier.com/locate/gfs

Not just for the wealthy: Rethinking farmed fish consumption in the Global South

Ben Belton^{a,*}, Simon R. Bush^b, David C. Little^c

^a Department of Agricultural, Food and Resource Economics, Michigan State University, 446 W Circle Dr, East Lansing, MI 48824, United States

^b Environmental Policy Group, Wageningen University, P.O. Box 8130, 6700 EW, The Netherlands

^c Institute of Aquaculture, University of Stirling, Stirling FK9 4LA, UK

1. Introduction

Fish¹ is a rich source of vitamins, minerals, fatty acids and high quality protein, playing an essential role in the diets of billions of consumers, many of them poor, malnourished and living in low and middle income countries (Thilsted et al., 2016; HLPE, 2014; Kawarazuka and Béné, 2011).

Fish utilized for human consumption is obtained from a continuum of sources running from capture fisheries (the harvest of naturally reproducing fish populations), to aquaculture (breeding and farming under controlled conditions). Global capture fisheries output peaked in the mid-1990s, and has plateaued or declined since (cf. FAO, 2016a; Pauly and Zeller, 2016). In contrast, aquaculture has boomed, growing at an average rate of 8.2% per annum over the past three decades. As a result, farming now provides more than half of the fish destined for direct human consumption (FAO, 2016b).

The growth trajectories of capture fisheries and aquaculture are often juxtaposed to make the case that sustained and rapid aquaculture development is vital to the future food security of fish dependent populations in Southern nations (e.g. Barange et al., 2014).

A counter-narrative (which we term 'economic geography'), holds that aquaculture largely fails to meet the needs of poor and undernourished Southern consumers. The narrative asserts that most farmed fish produced in Southern countries is destined for export to Northern markets (McIntyre et al., 2016; Ponte et al., 2014), and that farmed fish remaining in domestic markets is consumed primarily by wealthy urbanites (Beveridge et al., 2013; Bush, 2004; Ahmed and Lorica, 2002; Lewis, 1997). A related argument is that aquaculture production is concentrated in Asia and does little to address the needs of malnourished populations in Africa (Hall et al., 2013; Golden et al., 2016).

A second pair of narratives sets up contrasting visions around aquaculture's supply side. The first emphasizes the predominance and desirability of low intensity 'small-scale' fish farming that contributes directly to household food security and producer incomes (e.g. Bondad-Reantaso and Subasinghe, 2013). The second frames environmental

degradation and social dislocation associated with the rise of 'industrial' export-oriented aquaculture as compromising the food security of communities in Southern fish producing nations (e.g. Nayak and Berkes, 2011; van Mulekom et al., 2006).

We argue that despite their influence in shaping science, policy and popular perceptions, none of these narratives adequately account for the current diversity of aquaculture in the Global South, nor its aggregate 'macro' effects on food security. The remainder of this paper makes this case.

First we demonstrate that, contrary to the focus on international trade, farmed fish is overwhelmingly consumed domestically in Southern aquaculture-producing nations, and is increasingly widely available and readily accessible to low-income urban and rural consumers in these markets. Second, we address supply side arguments by challenging the dominant narratives linking aquaculture and food security and the prescriptions for promoting aquaculture that arise from them. We conclude by highlighting the need for future research and policy to pay closer attention to existing patterns of aquaculture development and their contributions to Southern food security.

2. International trade vs. domestic consumption

Seafood is among the most highly internationally traded food commodities (e.g. Asche et al., 2015; Tveterås et al., 2012). Fish and shellfish exports from developing countries exceed the value of coffee, rubber, cocoa, tea, tobacco, meat, and rice combined (Smith et al., 2010) and trade in fish products accounts for 10% of all agricultural exports (Gephart et al., 2016). In 2012, 37% of global fish production was exported (Kobayashi et al., 2015), with an estimated value of \$129 billion (HLPE, 2014).

The scale of the international seafood trade and its apparent tendency to move large quantities of fish away from poor food insecure Southern nations to wealthy food surplus countries renders it controversial (HLPE, 2014). For example, Smith et al. (2010) contrast the status of large net exporters of seafood (e.g. China, Indonesia, Vietnam,

* Corresponding author.

E-mail address: beltonbe@msu.edu (B. Belton).

¹ The terms 'fish', 'aquatic animals' and 'seafood' are used interchangeably as a shorthand for edible aquatic animals. Aquatic plants, algae, non-edible aquatic animals (e.g. corals, sponges), and aquatic mammals, are excluded all calculations in the paper.

<https://doi.org/10.1016/j.gfs.2017.10.005>

Received 9 March 2017; Received in revised form 2 October 2017; Accepted 27 October 2017
2211-9124/ Published by Elsevier B.V.

Table 1
Population, undernourishment, and aquaculture and fisheries production for selected countries.

Country	Population (millions) ^a	Prevalence of Undernourishment (% of population) ^{a,b}	Undernourished population (millions) ^c	Aquaculture production (t) ^d	Capture fisheries production (t) ^d	Aquaculture as a share of fish production (%)
Bangladesh	161	16	26	1,859,808	1,550,446	55
Brazil	208	5	10	472,829	765,287	38
China	1371	9	123	42,694,335	16,274,939	72
Egypt	92	5	5	1,097,544	356,858	75
India	1311	15	197	4,549,607	4,645,182	49
Indonesia	258	8	21	3,819,517	6,103,001	38
Myanmar	54	14	8	926,175	3,786,840	20
Philippines	101	14	14	815,008	2,335,004	26
Thailand	68	7	5	1,052,701	1,843,747	36
Vietnam	92	11	10	3,203,326	2,803,800	53
Subtotal	3714		418	60,490,850	40,465,104	60
World	7347	11	808	69,296,511	93,763,656	42
Subtotal as share of world (%)	51	n/a	52	87	43	n/a

Notes:

^a World Bank (2016).

^b Undernourishment refers to the percentage of the population whose food intake is insufficient to meet dietary energy requirements continuously.

^c Calculated from data in columns 2 and 3.

^d Production data for 2013 (FAO, 2016b).

Thailand, India, and Myanmar) possessing moderate to high levels of undernourishment, with the largest net importing markets (e.g. the United States and European Union), which are wealthy and well-nourished.

Asche et al. (2015) and Béné et al. (2015a) provide thorough synopses of the debate over whether international trade in seafood has positive or negative effects on fish consumption and poverty. Our intent in the present paper is not to contribute to the literature on seafood trade. Rather, we argue that an emphasis on international trade has obscured the contributions made by farmed fish to domestic food security in the main Southern aquaculture producing countries.

To demonstrate this point, we estimate the volume of fish originating from aquaculture and capture fisheries that are traded internationally, or remain in country for domestic consumption, for the ten largest aquaculture producing developing countries in the world – Bangladesh, Brazil, China, Egypt, India, Indonesia, the Philippines, Myanmar, Thailand and Vietnam (FAO, 2016a). Together these countries accounted for 87% of global production of farmed aquatic animals and 43% of global capture fisheries landings in 2013. They were also home to 51% of the global population, and 52% of all malnourished individuals (Table 1).

The trade component of the FAO Fishstat J database (FAO, 2016b), on which we base our analysis, does not specify whether internationally traded seafood products originate from capture fisheries or aquaculture. Following the methodology set out by Bush et al. (2013), we estimated the share of internationally traded aquatic animal products derived from each source, working on the assumption that the shares of farmed and wild fish species groups in exports from each country are proportional to the shares of farmed and wild fish of these species groups in national production.²

National fish production is reported by FAO in live weight equivalents (the weight of freshly harvested fish prior to any processing). The quantity of fish products traded internationally is reported in nominal terms - i.e. as the volume of fish traded post-processing (if any). To estimate the live weight equivalent (LWE) of each internationally traded product listed in Fishstat J we assigned conversion factors for

² At the country level, production data were categorized by the “ISSCAAP species groups” reported by FAO. Exports were categorized by “ISSCAAP commodity divisions”. Species divisions and commodity divisions were then combined under five aggregate “ISSCAAP commodity groups” (crustaceans, freshwater and diadromous fishes, marine fishes, miscellaneous aquatic animals, and molluscs, including cephalopods) to enable comparison across countries and product categories. The complete dataset used, including all calculations, is available for download (see Belton et al., 2017b).

similar categories of product, obtained from published sources (FAO, 2015; Bush et al., 2013; European Commission, 2011; Tacon et al., 2006). For each country, reported aquaculture production was divided by the apparent LWE of aquaculture exports to estimate the share of farmed fish exported and the share remaining as domestic food supply. The same procedure was followed for capture fisheries production and exports.

Fig. 1, reveals the extent to which excessive focus on international trade in seafood has inflated perceptions of its significance. The vast majority of fish farmed and landed in the ten most important Southern aquaculture producing nations is not exported. Eighty-nine percent of the farmed fish produced in these countries is consumed in their domestic markets. The share of capture fisheries landings exported is almost double that of farmed fish, and exceeds that of aquaculture in seven of the ten countries, but is still modest at 22%.

In eight of the ten countries, apparent domestic consumption of farmed fish exceeds 90% of total national aquaculture production. Only in Thailand and Vietnam do aquaculture exports exceed domestic consumption. Both these countries are also major exporters of capture fisheries products, and have fish supplies per capita well in excess of the global average of 20.1 kg, at 24.8 kg/capita/year and 32.7 kg/capita/year, respectively (FAO, 2016a, 2016c). Their seafood exports are surplus to domestic consumption needs, and do not divert food away from consumers at home.

To address the possibility that extrapolating the proportion of aquaculture and capture production to exports could bias results, we performed an alternative calculation using the most conservative assumptions possible with respect to aquaculture's contribution to domestic fish supplies. For this estimate, for each country, we attributed 100% of exports to aquaculture in species groups where production of farmed fish exceeded exports. For species groups where export volumes exceeded farmed fish production, we assumed that 100% of farmed fish was exported, with capture fisheries making up the gap between farmed fish production and total exports. Our original and alternate estimates are presented together in Table 2. The alternate estimate has little impact on the overall results: even under the most stringent assumptions, domestic consumption of farmed fish equals or exceeds 90% of production in seven countries and stands at 84% in one more, with only 15% of farmed fish exported overall.

These results are supported by data presented in FAO (2016a), indicating that freshwater fish (by far the most important category of fish produced in the ten selected countries) account for just 4.8% of international trade in fish by volume. Shrimp (the second most important

Download English Version:

<https://daneshyari.com/en/article/7454527>

Download Persian Version:

<https://daneshyari.com/article/7454527>

[Daneshyari.com](https://daneshyari.com)