Aquaculture xxx (2017) xxx–xxx

Contents lists available at ScienceDirect

Aquaculture

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

Mapping access to urban value chains of aquaculture in Laguna Lake, Philippines

Kristian Saguin *

Department of Geography, University of the Philippines, Diliman, Quezon City, Philippines

ARTICLE INFO

Article history:
Received 30 April 2016
Received in revised form 22 January 2017
Accepted 31 January 2017
Available online xxxx

Keywords:
Aquaculture
Value chain
Access
Urbanization
Philippines
Metro Manila

ABSTRACT

Urbanization has become a significant driver of aquaculture in the rapidly expanding cities of the global South. Using a case study of Laguna Lake and Metro Manila in the Philippines, this paper disaggregates the urban as a driver of aquaculture, and examines the social relations that structure urban-oriented aquaculture. It integrates access analysis with the value chain heuristic to identify how urbanization shapes domestic aquaculture value chains, and to map access mechanisms for firms and actors engaged in these chains. Macro-level urban processes drive aquaculture in at least four ways: as a source of demand for fish, as a source of input and capital flows, as a set of activities that transforms sites of aquaculture production, and as a sociocultural discourse. Micro-level mapping of access in the urban value chains shows a multitude of actors who derive benefits that range from direct participation in fish production and exchange to the indirect consumption benefits associated with lower-priced fish. Benefit and access mechanisms are unevenly distributed across the chain, and are configured and reinforced by social relations tied to place-based institutional contexts. Access analysis of urban value chains within the framework of urban drivers presents a means to evaluate the sustainability, poverty alleviation and development goals of aquaculture amid increasing urbanization.

Statement of relevance:

- Examines access mechanisms in poorly understood urban value chains of domestic aquaculture
- Identifies specific urban drivers of aquaculture development
- Provides analysis that combines a value chain approach with urbanization as a driver framework, which informs aquaculture goals of sustainability, poverty alleviation and development

1. Introduction

Urbanization has become a significant driver of aquaculture development, especially in the rapidly expanding cities of the global South (Bunting and Little, 2015; Little and Bunting, 2005). Population growth and higher disposable incomes have increased domestic fish consumption and demand that capture fisheries alone could not meet. These drivers are also accompanied by other facets of urbanization, such as the changing composition of urban fish consumption and environmental change in the peri-urban spaces of aquaculture. Urbanization is a process of population growth but it also entails a host of spatial, ecological, social, economic and cultural transformations with repercussions for meeting aquaculture's goals of sustainability, food security and poverty alleviation.

Aquaculture - in its immanent and interventionist forms (Belton and Little, 2011) - presents an opportunity to address urban needs for fish while improving its developmental promise for those engaged in the sector (Bene et al., 2016; Krause et al., 2015). The concept of value chains presents a holistic framework to extend analysis of development impacts beyond producers, and to include other actors who reap benefit from direct or indirect involvement in fish production, exchange and consumption. Mapping this distribution of benefit requires being attuned to both inter-firm relations within the chain and to extra-firm, place-based institutions and livelihood strategies. The emerging body of literature on global aquaculture value chains has shown the complexity of governing North-South transnational relations and the potentials for improving benefits derived from participation in the chain (Bush and Duijf, 2011; Dey et al., 2015; Islam, 2008; Jespersen et al., 2014; Ponte et al., 2014; Tran et al., 2013). Yet, value chain studies

* Department of Geography, 4/F Bulwagang Silangang Palma, Africa St., University of the Philippines, Diliman, Quezon City 1101, Philippines.
E-mail address: kcsaguin@up.edu.ph.

http://dx.doi.org/10.1016/j.aquaculture.2017.01.030
0044-8486/

have paid less attention to domestic aquacultural chains - including those with strong urban orientations - that still comprise majority of the world's aquaculture production (Belton and Bush, 2014). Understanding what drives these urban-oriented, domestic value chains should complement existing states of knowledge in well-documented global value chains (GVCs).

This paper seeks to contribute to understanding the drivers and social relations that structure the urban value chains of aquaculture through a case study of fish flows from peri-urban Laguna Lake to Metro Manila, the largest urban region in the Philippines. With a long history of engagement in aquaculture, the Philippines ranked as the world's 11th largest farmed food fish producer in 2012 (FAO, 2014). Unlike the strong export orientation of neighboring countries such as Thailand and Vietnam (Jespersen et al., 2014; Ponte et al., 2014), most of Philippine aquaculture production - with the major exception of aquatic plants - is destined for the domestic market. Despite 45% of the population residing in urban areas where per capita farmed fish consumption is higher, a gap in knowledge remains about the drivers and social relations that sustain the connections between urbanization and aquaculture.

The paper combines access and value chain analyses to map access mechanisms in urban aquaculture value chains. Recognizing the importance of governance and institutional factors (Hamilton-Hart and Stringer, 2016; Mohan, 2016; Tran et al., 2013), it presents a two-level analysis of the Laguna Lake aquaculture value chain, examining (1) macro-level urban drivers of the chain, and (2) micro-level access dynamics within place-based relations and institutions. Apart from issues of governance through lead firms driving the value chain, the paper extends broadly the focus on access mechanisms employed by various actors to obtain livelihood benefit from participation in the chain.

Urban processes shape urban value chains of aquaculture through particular macro-level mechanisms. While urban demand for fish as a result of rising incomes and population growth is important in eventual aquaculture chain configurations, other forms of urban relations can be identified, such as: the urban as discursive justification for interventionist aquaculture projects; the urban as a set of activities that impact production conditions; and the urban as source of input and capital flows. This objective of disaggregating urbanization as a driver of aquaculture seeks to establish how urban processes influence the configuration of aquaculture value chains, with implications for development through improved access and livelihood strategies, and value chain upgrading. Employing access analysis of urban value chains details the mechanisms that structure access to the chain through micro-level inter-firm coordination, local social relations and place-based institutions. A value chain approach rescaled to the urban is useful to identify actors, activities and relations that shape benefits derived from aquaculture beyond the sphere of production or the formal ownership or employment in farms. Combining access analysis of urban value chains with the framework of urban drivers of aquaculture addresses a knowledge deficit about what shapes the urban value chains of aquaculture, who benefits, and how.

2. Urban value chains of aquaculture

2.1. Urbanization and aquaculture

Despite rapid urban expansion in many of the largest aquaculture producing countries in the global South, mechanisms by which urbanization drives aquaculture production and consumption continue to be poorly documented. This omission becomes significant when situated within the importance of urban linkages of rural economies, including the largely-domestic orientation of aquaculture in the global South (Belton and Bush, 2014). Discussions of urbanization and aquaculture have focused primarily on emergent forms of urban and peri-urban aquaculture (Costa-Pierce et al., 2005), particularly the wastewater-fed and wetland-based integrated peri-urban aquaculture systems of Asia (Bunting, 2004; Bunting et al., 2010; Edwards, 2015). Building on insights from existing comprehensive reviews of urbanization and aquaculture (Bunting and Little, 2015; Little and Bunting, 2005), the following discussion identifies ways that urban processes drive aquaculture: (1) the urban as a source of demand for fish; (2) the urban as a source of input and capital flows; (3) the urban as a set of activities that transforms sites of aquaculture production; and (4) the urban as a sociocultural discourse.

First, the urban as a source of demand for fish is a function of population growth, increased incomes and changing consumption patterns in cities. As city-dwellers do not generally produce fish in urban areas (except for urban aquaculture), and as traditional capture fisheries alone could not meet demand for fish, aquaculture has emerged as an essential supplier of urban fish requirements (Belton and Little, 2008; Little and Bunting, 2005; Toufique and Belton, 2014). More than just sheer demand, urban markets of the global South are characterized by increasing affluence and changing consumption patterns. This affects aquaculture in terms of the types and varieties of fish that are in demand, and food quality, safety and sustainability issues tied to a more discerning middle class and a broader transformation of global South food systems (Belton and Little, 2008; Jespersen et al., 2014; Little and Bunting, 2005; Reardon et al., 2012; Toufique and Belton, 2014; Zhang et al., 2015). Higher urban fish prices also attract producers to supply fish to the urban market (Islam et al., 2004), while differences in fish prices and preferences would also segment urban consumption according to particular species (Little and Bunting, 2005).

Second, the urban is also an important source of inputs for aquaculture, specifically in the form of nutrients as fertilizer or feeds, and of capital and technical knowledge. The former is a significant consideration for aquaculture locating in or around urban centers, where there has traditionally been an availability of cheap nutrients from wastewaters and other domestic sources (Belton and Little, 2011; Bene et al., 2016; Karim et al., 2011; Little and Bunting, 2005). The latter takes the form of urban middle-class entrepreneurs who invest in aquaculture farms (Belton and Little, 2011; Miller and Atanda, 2011). These entrepreneurs have access to financial and technical know-how that enables them to pioneer early immanent aquaculture development in urban and peri-urban sites (Little and Bunting, 2005).

Third, urbanization drives aquaculture through various activities associated with urban sprawl, industrialization, and other forms of land use change. In many Asian cities characterized by a complex mixture of peri-urban land uses (McGee, 1991) such as Bangkok, Kolkata, Phnom Penh, Ho Chi Minh City and Hanoi, surrounding wetlands support multifunctional agricultural and aquacultural production primarily for urban consumption (Bunting and Little, 2015). Urban encroachment via industrial, residential and commercial developments, and surging land values have increased pressure for reclamation and infilling of these wetlands, as well as conversion of rice farms supporting integrated agriculture-aquaculture systems (Bunting and Little, 2015; Little and Bunting, 2005). Traditional wastewater-fed aquaculture dependent on nutrients from urban sewerage and drainage sources have also suffered a decline as a result of land use conversion and disruption in nutrient cycling flows, while pollution and poor water quality continue to affect aquaculture production in urbanizing wetlands, rivers, lakes and coastal zones (Bunting et al., 2010; Edwards, 2015; Little and Bunting, 2005).

Fourth, the urban can also take the discursive form of a policy justification for introducing aquaculture or of a sociocultural idea of urbanity in fish production and consumption. Early aquaculture development is often accompanied by discursive production of the urban as a potential market to legitimate aquaculture interventions as economically or socially feasible. The four mechanisms reviewed above are by no means exhaustive but they demonstrate the various ways that urban processes shape aquaculture practices. Identifying these mechanisms is not sufficient however in understanding urban-rural linkages in aquaculture where asymmetrical relations persist. Mapping actors, relations and the distribution of benefits within these urban chains is thus essential.

Please cite this article as: Saguin, K., Mapping access to urban value chains of aquaculture in Laguna Lake, Philippines, Aquaculture (2017), http://dx.doi.org/10.1016/j.aquaculture.2017.01.030