

Accepted November 2016 by *Economic Geography*

**Where chain and environmental governance meet: Inter-firm strategies in the canned tuna global value chain<sup>1</sup>**

Elizabeth Havice and Liam Campling

ABSTRACT

In value chain scholarship, ‘chain governance’ is the relationships of power among firms in a production network. For economic geographers working on the environment, ‘governance’ refers primarily to state and non-state based institutional and regulatory arrangements shaping human-environment interactions. Yet the theoretical and empirical links between these two concepts of governance are opaque. Drawing on a longitudinal case study of the canned tuna value chain and an historical materialist method, we demonstrate how inter-firm strategies over the appropriation of value and distribution of costs and risks work through the environment. We document moments of change in the value chain that enliven a dynamic understanding of how a lead firm becomes and reproduces its power, and strategies that subordinate firms deploy to try to counter the power of lead firms. We posit that these moves broaden value chain scholarship’s focus from governance typologies towards the ‘gravitational tendencies’ of capitalist competition and that such tendencies are inextricable from the environmental conditions of production through which they are made possible. This approach enables us to look at value chains and the environmental conditions of production as mutually constitutive, helping to explain vexing modern ‘environmental’ problems as a core element of the general tendencies, mechanisms and drivers of power in chains.

Key words: firm strategy, environmental governance, global value chains, global production networks, fisheries

---

<sup>1</sup> Authorship of this paper is fully collaborative.

## 1. Introduction

Economic geographers' differing uses of the term 'governance' meet in the study of resource-based sectors, yet the two fields have remained analytically distinct. In value chain scholarship both from a global value chain (GVC) or global production network (GPN) framework, 'chain governance' refers to relationships of relative power and coordination among firms.<sup>2</sup> Foundational work in GVC literature elaborates on whether and the extent to which some firms have the market power to 'govern' how those relationships operate from functional, profit-oriented, cost-reducing and distributional perspectives. GPN scholars (e.g. Coe and Yeung 2015) build from the buyer-driven or 'captive' chain governance in GVC analysis (e.g. Gereffi 1994; Gereffi et al. 2005) by theorizing lead firms' strategies to reproduce their leadership. In environmental economic geography, 'governance' refers primarily to the plethora of institutional and regulatory arrangements shaping and presiding over human-environment interactions, including resource extraction. These include state-led environmental agreements at global to local scales, market-based – often third party – environmental regulation, and private sector environmental commitments and investments, to name but a few.

In addressing 'the environment', value chain scholars generally illustrate the environmental impacts or opportunities that run in parallel to the existence and expansion of value chains, or highlight the impact that value chains have on the environment (e.g. Bolwig et al. 2010). As such, attention to the interplay between chain governance and environmental governance is a powerful possibility of value chain analysis that has not been adequately explored, despite prominent calls to do so (e.g. Clapp and Helleiner 2012; Dauvergne and Lister 2013). We suggest that this challenge emerges in part because value chain scholars' central focus on chain governance and upgrading has narrowed the field of analysis into typologies, to the exclusion of seeing chains as part of the larger socio-ecological dynamics of capitalism. We deploy the methodologically more open, proximate category of inter-firm strategies to capture the diversity of struggles over the distribution of value as firms articulate with and through the environmental conditions of production.

---

<sup>2</sup> We use 'value chain' as a general term to group chain tracing methodological approaches and denote empirical phenomenon (e.g. the 'value chain in canned tuna'). We use the global value chain (GVC) or global production network (GPN) nomenclature to refer to the analytical frameworks and their specific conceptual contributions.

The principal contribution of this paper is to describe how firms in value chains – both lead firms and otherwise – strategize *through relations with other firms by working through and using the environment* to appropriate value, pass on risk and costs and position themselves commercially and politically. We explore several inter-firm strategies – including a GVC understanding of chain governance as drivenness, private standards, and inter-firm association – that are generative of what we are calling the *environmental conditions of production*: the ever-shifting combination of regulatory, commercial and ecological conditions that shape and are shaped by dynamic resource extraction practices. We explore how strategic decisions that firms make in relations with other firms, such as whether to establish an association or centralize (mergers and acquisitions) ownership, work through the environmental conditions of production.

The ‘environmental’ issues that we tackle include overfishing, fisheries decline and related stymied resource management efforts at ‘sustainability’. Fish-as-food is a profoundly important use value to humanity, millions of people are employed in fisheries sectors, and fish products are an important commodity in international trade, especially for many economies in the global South (FAO 2016; World Bank 2010). In fisheries sectors, power dynamics governing the sphere of circulation (relations among firms within and across jurisdictions) are intimately linked to practices in the sphere of resource extraction and regulatory efforts to manage these practices (rules about how fishing firms remove fish from the oceans). Yet, the role of downstream dynamics in value chains in ‘governing’ the environmental conditions of production are rarely conceptualized and have not been elaborated empirically. Instead, efforts to describe or rectify problems related to resource extraction tend to either a) idealize prospects for leadership by lead firms in correcting them (Österblom et al., 2015) or, b) blame fisheries resource managers and coastal and island states for weak governance (e.g. World Bank, 2009).

The empirical component of the paper focuses on the European Union- and United States-centered value chains in canned tuna, which comprise the vast majority of the global consumer market for such products. While relatively ‘short’ in terms of the sequence of ‘nodes’ (see figure 1), the value chains that deliver the familiar can of tuna are geographically dispersed, logistically complex and intersect with varied forms of public and private environmental governance (Hamilton et al.,

2011). Tuna are caught primarily with industrial fishing gears in the tropical oceanic regions. Product is differentiated by species and quality: skipjack or ‘light meat’ is the highest volume and lowest price product line, yellowfin is a premium product, and albacore or ‘white meat’ feeds into some premium product lines. A fourth species, bigeye, complicates this equation: while not directly targeted for canned tuna production, bigeye are ecologically fragile and are commonly caught as bycatch alongside skipjack (WCPFC 2015). Thus, protecting bigeye would require changes in the current extractive model.

In the next section we review GVC and GPN literature on governance and firm strategy alongside work on governance in environmental economic geography. Sections three and four investigate how inter-firm strategies *implicitly* create and contend with environmental conditions in the canned tuna value chain. Section five draws attention to instances of firms developing strategies in relation to other firms that explicitly articulate with the environmental conditions of production. Section 6 offers conclusions and implications of our findings for value chain scholarship and researchers interested in environmental governance.

Data used here have been collected continuously since 2005. The long term nature of this project has enabled us to document the centrality of ‘the environment’ to how lead firms *become* and how their power is contested by other firms, states and non-state actors over time. Together and individually we have conducted semi-structured interviews in 18 countries with over 500 people, primarily industry representatives, government officials (especially in fisheries and trade agencies), fisheries science and management experts, fish workers and their representatives, and officials from international organizations and environment- and development-oriented advocacy organizations. For supporting data and context, we analyze news media, industry press, academic literature, gray literature and descriptive statistics on production, trade and sales available through secondary sources such as the scientific committees of regional fisheries management organizations and private sector data sources.

## **2. Inter-firm Strategies, Economic Geography and the Environment**

Chain governance is the most important conceptual contribution of the GVC framework and has been the focus of attempts at specifying models of inter-firm linkages and their relation to degrees of chain drivenness and coordination (Gereffi et al. 2005; Gibbon et al. 2008; Ponte and Sturgeon 2014). Recent GPN scholarship has built from the GVC model of chain governance, emphasizing intentionality and agency in accounting for outcomes in chains and bridging economic actors to structural dynamics in the economy (Coe and Yeung 2015). This approach identifies four firm strategies, which generally work within a model of chain governance dominated by lead firms: intra-firm coordination (internalization), inter-firm control (lead firm organized externalization), inter-firm partnership (collaboration, co-evolution and joint development of a lead firm and its strategic partners for competitive advantages) and extra-firm bargaining (negotiation and accommodation between firms and extra-firm actors around value capture) (Coe and Yeung 2015: 123-163). While bringing conceptual nuance to thinking about the layers of inter-firm and extra-firm strategies, this focus can have the effect of flattening power in value chains, obfuscating the nature of value chains within the general dynamics of the system of global capitalism.

Conceptualizing the environment as central to the dynamics of contestation and change among capitals in competition requires broadening beyond deductive typologies of ‘governance’ (Bair and Palpacuer 2015). To do so, our methodological approach assume that the historical diversity of inter-firm relations is shaped by the ‘gravitational tendencies’ (Shaikh 2016: 5) of the capitalist profit motive, including competition over the distribution of costs and risks and the appropriation of value ‘let go of’ by other firms (Bair 2005; Starosta 2010).<sup>3</sup> We situate ourselves in the rich tradition of empirical work that has identified a diversity of strategies deployed by firms to try to shape outcomes in their relations with other firms in natural resource-related sectors ranging from Chayanov (1966) to Gibbon and Ponte (2005). These dynamics are overdetermined – i.e. shaped by complex articulations of historical agents, institutions and environmental conditions of production. Thus we should not expect to see the same relations among firms even in similar value chains, but would expect them to be shaped by the same ‘gravitational tendencies’. In other words, and following Pickles and Smith’s (2016) call for a conjunctural economic geography, we maintain

---

<sup>3</sup> Following Starosta (2010), we use ‘let go of’, rather than produced by firms because processes of exploitation of labour in articulation with nature *produce* surplus value. Firms are a formal or customary legal form that encloses this social relation of production.

that inter-firm strategies are time and place contingent, making it difficult to predetermine which will be more or less important in any particular set of interfirm contexts. In this sense, inter-firm strategies is a proximate category that combines other conceptual contributions without privileging one over the other and without relying on mono-casual explanations such as transactions costs and increasingly fine-grained and deductive typologies of chain governance.

This approach enables us to look at the relations between firms in value chains and the environmental conditions of production as mutually constitutive, helping to explain ecologically and politically vexing modern environmental problems by making the general tendencies, mechanisms and drivers of power in chains visible. The growing fields of environmental economic geography and international political economy of the environment have turned attention to how the environment plays into firm accumulation strategies, not least because natural resources are increasingly conceptualized as integral to economic issues, to the point where they ‘might be considered at the forefront of – rather than marginal to – economic geography’ (Bakker, 2012, pg106).

Three themes on the relationship between firms and the environment that inform, or directly draw upon value chain studies, have emerged. First is research theorizing the dominant, yet contingent, power of firms within the system of states and international institutions involved in global environmental governance. Findings highlight that firms work through the state to secure their interests in inter-state environmental negotiations (Levy and Newell, 2005; Newell and Paterson, 1998) and gain legal protection in trade agreements from the potentially negative environmental outcomes of their activities (McCarthy, 2004). Firms have also been found to collaborate in associations to push agendas in international environmental agreements though collaboration is complicated by internal conflict (Pulver 2002).

The second stream of research explores the relationship between the environment and power relations among firms in value chains. There are two sub-streams here. In one, GVC and GPN scholars deploy the chain/network tracing methodology to point to the materiality and territoriality of natural resources as central in structuring firm-state relations and socio-ecological possibilities in chains (Bridge, 2008; Gellert 2003; Havice and Campling, 2013). The other centers on ‘buyer

power' in value chains as a mechanism through which branded firms act as global environmental governors. In this case, attention to inter-firm relations reveals that 'big brand' sustainability is actualized through buyer power, enabling big brands to leverage corporate sustainability to reproduce their own commercial advantage (often at the expense of less powerful firms in the chain) (Dauvergne and Lister 2013).

Third is 'environmental upgrading'. Bolwig et al. (2010) offer an initial mapping of ways value chains 'affect the environment' directly in primary production and indirectly by emissions produced in activities along the chain. Their framework identifies how the multi-scalar 'impacts' of value chains such as poverty, gender and the environment can be mitigated by firms' upgrading strategies. From the perspective of inter-firm relations, this group identifies environmental upgrading as a potential competitive advantage that suppliers might strategically develop and deploy to improve their position, (De Marchi et al. 2013; Goger 2013; Khattak et al. 2015), though lead firms have been found to selectively engage in more or less 'shallow' or 'deep' levels of collaboration with suppliers (Jeppesen and Hansen 2004). From this lens, environmental upgrading is, in part, an important way for suppliers to navigate inter-firm power relations. In short, the main emphasis of the nascent environmental upgrading literature is on identifying and improving on the environmental *impacts* of firms from a policy-oriented lens.

Building from these three streams, we work through the interplay between the tuna value chain and specific strategies that firms deploy to create and contend with the environmental conditions of production that are central to our case. Before turning to the empirical findings, we highlight two further points on method. First, unlike Coe and Yeung (2015), we do not *presuppose* the existence of lead firms and the power that they exert over other firms in chains; instead, analyzing inter-firm strategies and the environmental conditions of production together enables us to make sense of our case without ontological separation from the totality of capitalism, which is the larger object of interest that our case informs. As Henry Bernstein points out

the advantages of the [value chain] approach in cutting a particular 'slice' from larger economic organisms to examine under the analytical microscope, may have corresponding disadvantages if we lose sight of the entities from which the 'slice'

is extracted, how and where it fits into, and is shaped by, other elements of those entities (1996, 128).

Through sensitivity to the interplay between system-wide socio-ecological dynamics (the abstract) and categories that better explain local specificities and contingencies (the concrete inter-firm strategies identified in our research) we identify how firms mediate the dynamics and tendencies of capitalism through the environment.

Second, this method opens political space for seeing inter-firm relations as contingent sites of struggle over the distribution of value, cost and risk, that manifest in relations around institutions (Nielson and Pritchard 2009), class (Selwyn 2012), gender (Mezzadri 2012) and the environment (Bridge 2008). Inter-firm strategies may be developed and deployed by lead firms, and they can be (and are) resisted and reworked by less powerful firms. These ‘frictions’ (Tsing 2005) are an always-already existing aspect of supply chain capitalism. In our case, attention to inter-firm strategies also casts new light on the stymied and entrenched politics of fisheries management, allowing us to broaden our understanding of the politics of ‘environmental conditions of production’ at the point of extraction.

### **3: Chain governance in the canned tuna industry**

#### *Supermarkets/ retail*

Our account of the articulation of inter-firm strategies with environmental conditions in the tuna value chain begins with a classic GVC story of drivenness at the ‘end’ of the chain: supermarket power. As is well established, the ‘supermarket revolution’ of the 1980s shifted market power from branded-manufacturing firms to large retailers, initially in the UK and US and later in the 1990s to Western Europe and Japan, and increasingly much of the global South (Durand and Wrigley, 2009; Reardon et al., 2012). Supermarkets’ increased market share and sales density generate enhanced economies of scale, buying power and reduced unit costs relative to competitors, resulting in an oligopolistic structure (Burt and Sparks, 2003). As a result, retailers’ power over suppliers of primary commodities and basic manufactures has increased, allowing them to pass costs onto branded-manufacturers.

Growing concentration and centralization enables supermarkets to develop a range of techniques related to their lead firm status that sharpen competition among suppliers. Supermarkets play branded firms off of each other through the practice of ‘slotting’: a branded-firm rents premium shelf space for a period, and even then may be squeezed for additional revenue within that period so maintain their retail ‘real estate’. As one manager of a major UK tuna brand put it, supermarkets are asking: ‘what is it worth for you to be on the shelf?’.<sup>4</sup> Supermarkets also have the power to discontinue (or ‘delist’) a brand if it does not provide a sufficient return to the supermarket.<sup>5</sup> For instance, in 2013 and 2014 Tesco delisted 70 products sold by Princes (owned by Mitsubishi), including canned fish (Bamford 2014).

In our case, canned tuna is a ‘core category’ for retailers in the US and in many EU principal markets: it has high turnover and customers compare prices across outlets. Studies on tuna sales in the US have shown that supermarket customers with tuna in their ‘basket’ spend 65 percent more on a shopping trip than customers without it (Lischewski, 2006). In the US and UK, retailers often sell canned tuna on promotion, competing to attract high-volume consumers (Spruyt, 2000). Big retail firms pass the cost of such promotions on to suppliers. A senior executive of a US canned tuna brand elaborated on this dynamic:

Supermarkets have 100 percent control now. In the late 70s, early 80s the food business told stores what to do. It began with increased prices for ‘real estate on the shelf’. ... Now they tell *us* what we’re gonna do, and what our margin is going to be.<sup>6</sup>

Supermarkets also express control over major brands through their own-brands or ‘private label’ (Hughes, 1996), which is an increasing percentage of market share in major markets (Table 2). Supermarkets’ lower marketing and per unit supply chain management costs enable them to sell private label more cheaply than the branded equivalent, exacerbating price pressures on branded-manufactures.<sup>7</sup> Moreover, they can switch shelf space to their private label canned tuna. As one representative of a Thai firm exporting to both the EU and the US put it, the supermarkets are ‘trying to kick out most national brands and promote their *own* brand’.<sup>8</sup> A second US branded firm

---

<sup>4</sup> Interview, EU industry representative, May 2007

<sup>5</sup> Interviews, EU industry representatives, October 2005, June 2010.

<sup>6</sup> Interview, US industry representative, May 2006.

<sup>7</sup> Interviews, EU and US industry representatives, March 2009 and February 2006.

<sup>8</sup> Interview, Thai industry representative, May 2006

executive specified: ‘We try to influence our shelf price. It used to be easier, but no-one wants to step-up, they’re afraid of retaliation [from supermarket buyers]’.<sup>9</sup> In the US, the concerns of this executive have been realized. In late 2015, retailers launched class action lawsuits and more than 44 related cases accusing the major three brands – Starkist, Bumble Bee Foods and Chicken of the Sea – of a price-fixing scheme. A foundation of the claim is rooted in the environmental conditions of production: in the time leading up to the allegations, raw material prices were at record lows as extraction volumes sky-rocketed. The retailers argue that the brands should have dropped their prices in the face of these savings (LaFreniere 2015).

Big retail capital uses chain governance strategies not only to wield influence over *small* producers, as often illustrated in GVC analyses (e.g. Neilson and Pritchard 2009), but also over large enterprises. Competitive dynamics squeeze both branded- and non-branded manufacturers of canned tuna, forcing them to sell at lower prices and trim their own margins or, in the case of the US-centred chain, degrade quality by using volume enhancing additives, smaller can sizes and/or lower grade fish.<sup>10</sup> These competitive accumulation strategies are environmental governance because they are contingent commercial tools that nurture high volume, low price production practices that are realized through raw material supply.

---

<sup>9</sup> Interview, US industry representative, May 2006

<sup>10</sup> Multiple interviews, US industry representatives, May 2006, and EU industry representatives, September 2010.

**Table 2: Supermarket and brand concentration in selected principal markets for canned tuna in late 2000s/early 2010s**

Country	Top 5 supermarket chains (and % share of total grocery sales)*	Top 5 supermarkets share of total grocery market*	Main 'national' brands of canned tuna (and % share value sales)	Private label as % canned tuna sales
USA	Wal Mart Stores, Inc (16.4%); Kroger Co (10.7%); Safeway Inc (5.1%); Supervalu (4.5%); Publix Super Markets (4.0%) (2010)	40.6%	StarKist (29.7), Chicken of the Sea (14.7); Bumble Bee (29.4) (2013/14)	14.0% (2013-2014)
UK	Tesco (31); Asda (16.5); Sainsbury's (16); Morrisons (12); Co-op (5)	80.5%	John West (35.5); Princes (24.8) (2009/10)	38% (2009/10)
France	Carrefour (25.3); Leclerc (16.1); EMC Distribution (13.2); Auchan (12.6); ITM Enterprises (Intermarché) (12.6)	79.8%	Petit Naivre (23); Saupiquet (18); Chancerelle (5) (2008)	38% (2008)#
Germany	Edeka (18.6); Rewe (14.7); Metro (14); Schwarz (Kaufland & Lidl) (11.2); Aldi (10.5)	79%	Saupiquet (4).	95% (2010)
Netherlands	Albert Heijn (29.5); Superunie (29.5); Schuitema (C1000) (14.5); Aldi (9); Super de Boer (7.5)	90%	John West (43.5); Deep Blue (22.3); Princes (18.7) (2009/10)	15.5% (2009/10)

\* 2006 or nearest available year

Sources: (Campling, 2012a; Melbourne, 2014; USDA, 2015 and Personal Communication USDA ERS, August 2015).

### *Branding and processing*

GVC scholars document that supermarkets are not the only ‘lead firms’. Branded-merchandisers and traders can also act as ‘core’ companies, and degrees of ‘drivenness’ depend upon the specificities of the industry in question (Gereffi 1994, Gibbon and Ponte 2005). As such, these GVC scholars have turned attention to market power (or lack thereof) that firms *in the middle* of supply chains – those engaged in branding and processing – have over chain governance dynamics (Daviron and Ponte, 2005), including in relation to the management of environmental concerns (e.g. Goger, 2013).

Firm strategies for coping with chain governance underwritten by centralization interface directly with the environmental conditions of production in branded and non-branded nodes in the canned tuna chain. Global processing capacity far outstrips the raw material supply that the oceans can deliver (McGowan and McClain, 2010). Through the 1990s there was a 30 percent gap between processing capacity and actual consumption (StarKist, 2001), a gap that worsened in the 2000s with US\$500 million invested in new processing facilities between 2006 and 2008 (Hamby, 2009). Meanwhile, consumption declined in the US and levelled off in the EU – the two most important markets for canned tuna (Hamilton et al. 2011). According to a plant manager in Ecuador, ‘There’s overcapacity everywhere in processing. ... People built plants before fishing restrictions were in place and the processing capacity is slow to correct’.<sup>11</sup> Because processors rely on high volumes to generate profit in a low-margin industry, they compete for tuna raw material (the highest input costs) and generate demand for more tuna extraction. To secure supply, they develop sourcing strategies in relations with the fishing firms that are extracting raw material in the oceans.

*Branded ownership* in canned tuna is increasingly centralized, though the strategies that yield centralization are sites of continuous change and struggle among firms. Until the late 1980s, processors individually owned national brands. Giant food multinationals such as Heinz, Mitsubishi and Unilever began to internationalize by acquiring overseas canned tuna brands in Europe and the United States (Hamilton et al 2011). These moves initiated a slow process of centralization through mergers and acquisitions (M&As), which rapidly accelerated in the early

---

<sup>11</sup> Interview, Ecuadorian industry representative, August 2010.

2010s leaving only five firms controlling all of the dominant brands in the EU and North America (Figure 2).

**Figure 2: Controlling firms in the EU and North American canned tuna markets**



Firm logics underlying M&As reveal the ongoing power struggles between firms in the centralization process, as well as the way they are explicitly articulated with the environmental conditions of production. The different logics behind individual M&As also indicate that centralization manifests for historically specific reasons. First, M&As diversify and secure raw material access in multiple oceans, reducing the political and regulatory risks associated with sourcing from one ocean. Second, firms acquire premium brands that resonate with consumers to command higher brand rents and supply a wider geographical range of markets. Third, through centralization, branded manufacturers enhance economies of scale in manufacturing and raw material buying power. Raw material supply is central to the success of each strategy.

*Non-branded* manufacturer's activities and business models are primarily oriented around supplying finished product to these increasingly centralized private labels and brands.<sup>12</sup> Non-branded manufacturers emerged when branded firms began outsourcing production in the 1970s, reflecting changing costs structures in which brands maintain control over production without doing the processing themselves. For example, in the early 1970s EU-centred value chain, Western Europe, Japan, and West Africa were the main locations for tuna processing. From the early 1980s onwards, the manufacturing node dispersed geographically as: (neoliberal) policies of export-orientated industrialisation flourished, commodity frontiers opened in the Indian and Western Pacific oceans, new industrial purse seine fleets divorced from supplying their 'national' production systems (especially boats owned by Taiwanese and South Korean firms), and technological and organizational innovations enabled production to disperse (Campling, 2012a). These dynamics located new production sites in Southeast Asia, the Indian Ocean and the Pacific Islands where factories often received substantial state subsidises, including through joint-ventures with foreign firms (Havice and Campling, 2013).

Supermarket and branded firms' strategies are historically formulated around geographically dispersed, export-oriented non-branded firms that ensure regular supply 'because of the possibility of sourcing from so many places around the world'.<sup>13</sup> This chain governance move – a spatial fix in the form of 'global ocean strategy'<sup>14</sup> – protects brands and supermarkets against regional fluctuations in raw material supply and price (e.g. declining catch rates, El Niño events, piracy) and wider local political-economic dynamics (e.g. labor struggles, political crises, violent conflict). Supermarket buyers play non-branded manufacturers against each other in price negotiations and growing centralization offers the remaining leading branded-firms similar advantages. These conditions help explain why the price of canned tuna in the US declined by 68 percent in real terms between 1980 and 2004 (Lischewski 2006).

The non-branded node is considerably less concentrated than branding or retail. Multiple, independent sites of non-branded production have emerged on all continents. In contrast to the five firms that own the dominant brands in the EU and North America (Figure 2), around 240 processing plants dotted the world in 2012, the vast majority of which are owned by non-

---

<sup>12</sup> These firms sometimes also own a 'brand', but it is normally oriented to domestic or minor sub-regional markets.

<sup>13</sup> Person. comm., EU industry representative, October 2005.

<sup>14</sup> One manager called this a 'multi-regional strategy' (Interview, US industry representative, February 2006).

branded processors.<sup>15</sup> The extent of supermarket and branded-firm power over non-branded manufacturers is reflected in their application of a ‘cost plus’ formula in supply arrangements: buyers pay costs along with a pre-determined profit margin.<sup>16</sup>

Non-branded firms often attempt to counter buyer power not just through inter-firm relations, but also through the environment. For example, some are located in production sites benefitting from economies of scale and efficient labor forces, such as in Thailand and Ecuador, but whose profitability is threatened with insecure raw material supply when catch volumes are low or inter-firm linkages with raw material suppliers are indirect. Others are sited in geographic proximity to tuna resources such as small tropical islands, but these face competitive disadvantages in terms of lack of economies of scale, expensive transportation costs and labor availability and relative cost. Fishing firms, traders and big brands also secure resource access through non-branded manufacture: they exchange investments in labor-intensive processing plants for fishing rights in resource rich countries (see Havice and Reed, 2012). The complex logics of non-branded firms are thus often linked to national development policy and ‘upgrading’ objectives, which in turn can complicate state regulation of resource extraction necessary to feed the plants. These dynamics make non-branded manufactures a transmission belt that feeds the high volume, price squeezed features of the sector upstream towards the point of extraction (and its direct management).

#### **4. The Boats**

The prior analysis revealed a classic chain governance story in which lead firm and non-lead firm strategies are implicitly articulated with and through the environmental conditions of production by assuming sufficient availability of tuna resources to comply with the demands of chain governance from a concentrated retail ‘end’ of the chain. The imperative to maintain high volumes of raw material throughput in the value chain structures individual firms’ strategies and relations between firms. It is well documented that buyer-drivenness in the sphere of circulation has tangible impacts on socio-ecological relations of production in food systems (Freidberg, 2007; Gennet et al., 2013). Like non-branded processors, boats owners

---

<sup>15</sup> Industry source, April 2015.

<sup>16</sup> Multiple interviews, Thai industry representatives, April 2015.

face pressures for high volumes and the constraints of low prices. To contend while also managing fuel and fish price volatility, labor and insurance costs, vessel owners and operators have tended to intensify production, modifying extraction practices by shifting to gear types that increase ‘catch per unit effort’ (i.e. volume of fish caught each time fishing gear is set) and increasing vessel size to maximize catch before returning to ports to offload (Campling 2012). In addition, demand for tuna raw material from an overcapitalized processing sector has attracted capital into new fishing vessels (Havice, 2013; ISSF, 2014a), deepening competitive dynamics between fishing firms.

We argue that the well documented tuna fisheries management organization failures (e.g. Lodge et. al 2010) can be explained in part by the failure to recognize that they are regulating not only ‘boats’ or even of ‘fishing nations’, but the competitive effects of downstream interfirm relations. As such, fisheries management bodies are indirectly engaging in the management of interests across tuna value chains. Boat owners’ strategies are formulated in relation to actions and politics associated with fisheries management (a point widely acknowledged in the policy sphere, e.g. OECD 2003) *and* to the pressures and opportunities their interactions with the broader chain present. Yet, these intersections are rarely acknowledged in either fisheries management bodies or in value chain literatures. Fishing firms navigate this complexity through at least two (interlinked) inter-firm strategies: 1) heterogeneity in ownership and business strategies; and, 2) association (see section 5).

#### *Vessel ownership, financing and contracts*

Fishing activities are linked to the sphere of commodity circulation through historically and geographically variable shifts between ownership/ forward integration, supply contracts, spot markets and financial dependency. For example, until the 1970s, some branded tuna processing firms in the US owned vessels before divesting when globally, vessel building, and thus supply, grew rapidly in the 1980s (Havice 2009). Today, as resource access has become more competitive, relations between boats and downstream actors remain important. For example, according to a manager of an export-oriented non-branded processor in Ecuador that owns fishing vessels: ‘Vertical integration is very important for us. It ensures supply and that we can make our final product. It helps us to be as consistent as possible in our contractual obligations’.<sup>17</sup> Likewise, since the early 2000s, trading company Tri Marine, started backward

---

<sup>17</sup> Interview, Ecuador industry representative, August 2010.

integrating into boat ownership in order both to ensure a portion of raw material supply and to learn more about the cost structure of boat ownership so as to better negotiate with suppliers.

However, vertical integration between boats and trading/ processing nodes is not uniform. In the EU industrial tuna fleet, in 2011, three branded-processors owned 34 percent of the purse seiners, four firms specialized in fishing owned another 33 percent, and the rest of the vessels were owned by various arrangements of owner operators (Campling 2012). In the US fleet, in 2014, 37 percent of the fleet had investors from large Taiwanese shipbuilding firms (Seaweb database, October 2014). Outside of formal ownership, trading companies and processing companies manage supply relations with fishing firms through supply contracts, vessel financing, and conditions of resource access arrangements. For example, a procurement manager for a non-branded firm in Ecuador that is 51% owned by a large trading firm said, ‘We don’t have boats, we have long term relationships with boat owners. We buy everything that they bring. ...We pay in advance and pay fuel in advance. We don’t have contracts with them, but the relationship is long term. To keep the working relationship good, we loan them money’.<sup>18</sup> In the 1970s Japanese trading firms provided various types of financing to Korean and Taiwanese fishing companies and were repaid in fish (Comitini 1987). This practice meant that trading firms were assured of regular supply without assuming the financial risk of boat ownership, but became less common with the boom in global purse seine capacity (and tuna supply) from the 1980s onwards. In the mid-2000s, the Taiwanese trading company FCF spearheaded a processing plant investment in Papua New Guinea that came with long-term strategic resource access, which was then sold to boat owners locking them in to supply fish without FCF having to assume the risk of boat ownership.<sup>19</sup>

Inter-firm strategies and formal environmental governance (fisheries management) meet at the fishing node of the chain. Yet, fisheries management bodies treat fishing vessels as isolated actors engaged in a technical act, leaving them and their management disconnected from the inter-firm strategies which shape resource extraction. We have demonstrated that inter-firm strategies drive a volume imperative that in turn, shapes fishing practices and the resulting environmental conditions of production (i.e. fisheries decline and overcapacity). These

---

<sup>18</sup> Interview, Ecuador industry representative, August 2010.

<sup>19</sup> Interviews, industry representatives, 2006.

strategies intertwine with and generate an inter-state fisheries management structure that has enabled dramatic growth in resource extraction that has kept raw material volume high.

## **5. Environmental governance as chain governance**

In what follows, we look at three nodes (fishing, processing and retail) where firms explicitly engage with the environmental conditions of production to stabilize or improve their position in chains. We show two inter-firm strategies that build from existing chain governance structures and use environmental conditions of production to reshape or navigate power relations in the chain: environmentally-framed standards and association in which firms cooperate with horizontal competitors around an environmental logic in order to (temporarily) defend collective interests in their node. In offering their own ‘solutions’ to ‘environmental’ problems, firms are deepening and reformulating their strategies and positions in the tuna value chain that contributed to the environmental problems in the first place. The inter-firm strategies we examine here are now a norm in value chains, as illustrated in literature on corporate environmental governance as risk management (Meckling, 2015) or as a mechanism to deflect criticism from enterprises and investors (Bracking, 2009). Our examples illustrate that the environmental conditions of production are central to how firms (including non-lead firms) change and contest power dynamics in chains.

### *Fishing*

Lead firms put intense – though most frequently, indirect – commercial pressure on boat owners to fish harder, faster and further. Competition among fishing firms is sharp because ownership is not concentrated. In response to these conditions, tuna vessel owners and operators developed an association: the World Tuna Purse Seine Organization (WTPO). WTPO members cooperatively self-regulate their fishing activities to influence chain dynamics and lobby for stronger state-led fishing regulations. This association articulates with the environmental conditions of production and is a tactic undertaken by non-lead firms in a decentralized node of the chain to exert pressure on lead firms to increase raw material price.

From the mid-1980s, high demand for canned tuna spurred a boom in processing plants and in turn, purse seine boat building which enabled branded-processors like Heinz to outsource boat ownership. Branded firms were able to externalize ownership because they had oligopsonistic

control over access to markets and could thus exert a high degree of inter-firm control over boat owners. The period of increased supply of canning-grade tuna that followed translated into a sharp decline in tuna prices, which deepened competitive pressures throughout the chain into the late 1990s and early 2000s. At the time, there were no limits on fishing outputs or capacity in the RFMO in the Eastern Pacific, and there was no RFMO in the Western Pacific, the two most important fishing grounds. In the face of low prices, fleet representatives from Ecuador, France, Japan, Philippines, Spain and South Korea representing 65 percent of global purse seine catch voluntarily formed the WTPO and restricted their own members' fishing activity by extending their time in port (Tarte, 2002). Upticks in skipjack prices rewarded the effort (Morón, 2002), but tensions within the WTPO were rife because 'most members didn't abide by decisions'.<sup>20</sup> For example, at this time Taiwanese and Philippine interests built boats and Spanish fleets aggressively accessed the Western Pacific (Joseph, 2003).

After tuna prices stabilized in the early 2000s, the WTPO receded. When price again collapsed in 2014, the WTPO re-emerged. By this time, state-led environmental governance had further developed, so the group articulated its actions in relation to state regulation, seeking to ally with coastal states' environmental governance interests. WTPO appealed to Pacific island countries whose waters are the source of ~60 percent of global tuna catch, asking the island countries to close fishing in their waters for two months. The islands rejected the request (Campling and Havice, 2015). In the absence of a state-mandated closure, in mid-2015 the WTPO again exerted the power of collective action and agreed to extend their port turn-around time to reduce fishing effort by 35 percent. The effort was designed to force prices up and to improve revenues for fishing firms as the expense of buyers, without presenting too much risk for any one fishing firm (Havice et al., 2015).

The WTPO is an inter-firm control strategy designed to mitigate the vulnerabilities that boat owners face vis-à-vis buyers as the least centralized node in the value chain. It is premised on its members' direct articulations with the resource and the regulators of fisheries access (coastal and island states). Through association, decentralized fishing firms attempt to counter downstream control relations by big retail and branded firms; it is an ephemeral strategy that flexibly emerges and recedes in relation to the mediation between resource availability

---

<sup>20</sup> Interview, international fisheries specialist, May 2006.

(environmental conditions of production) and downstream commercial pressures usually dictated through the power of lead firms.

### *Processing/ Trading*

Association is not used only by the ‘weak’ to countervail lead firm control strategies. In 2009 tuna branded-processors partnered with NGO WWF (led by WWF-USA) and with prominent scientists to develop the International Seafood Sustainability Foundation (ISSF). A charitable organization, ISSF’s stated mission is to undertake ‘science-based initiatives for the long-term conservation and sustainable use of tuna stocks, reducing bycatch and promoting ecosystem health’ (ISSF, 2014b). Processing firms’ formation of ISSF is not simply an effort to contend with growing social norms around sustainability, but a collectivity that ensures these firms’ own reproduction in an era of deepening competition for, and political contestation over, tuna resources. ISSF tactics are inseparable from existing inter-firm control strategies in the chain, including the highly centralized branded and retail nodes and the tendency to explicitly regulate ‘the environment’ at the fishing node of the tuna value chain. As with the WTPO, the association strategy works with existing governance dynamics and *through* dynamic environmental change. Distinctions between the ISSF and WTPO models illustrate the diverse possibilities of association as an inter-firm strategy explicitly developed around ‘the environment’.

By mid-2015, the commercial members of ISSF were 19 branded and non-branded manufacturers representing roughly 75 percent of the total global tuna processing capacity<sup>21</sup> and providing the potential for control through association: as a collective, ISSF members *could* use their buying power to extend environmental governance practices to the sphere of circulation. However, in addition to ‘member commitments’, ISSF focuses on influencing environmental practices in *other* nodes of the chain, especially fisheries management, and on managing its members’ interactions with these practices (ISSF, 2013; no date). While ISSF’s work is broad, we draw on two examples of environmentally-framed association that influence the tuna value chain.

---

<sup>21</sup> Email communication, ISSF, July 2015. ISSF also includes one of the big three tuna trading companies (Tri Marine). But we exclude this node in Figure 3’s coverage of ISSF to avoid conflating non-members (FCF and Itochu).

First, as retailers have begun to seek supply of tuna products that are certified as ‘sustainable’ (below), several tuna fisheries have begun the Marine Stewardship Council eco-certification process. In 2011, MSC recommended certification for two tuna fisheries: the Western and Central Pacific free-school skipjack purse seine fisheries (free-school, rather than on fish-aggregating devices – FADs – that have higher incidence of by-catch), covering over 400,000mt of tuna catch annually, and the New Zealand albacore troll fishery, a much smaller (roughly 3,000mt annually), but commercially relevant fishery. In response, the ISSF lodged formal objections at the MSC to both certifications, primarily on grounds that auditors did not follow certification process procedures, and, more fundamentally, that the RFMO regulations overseeing the fisheries were not robust enough to meet requirements for an eco-certification (Jackson, 2011).

Both fisheries eventually were certified following formal responses to ISSF objections, but the objection illustrates that ISSF provides the processing sector with a novel inter-firm control strategy to influence environmental governance. First, it enabled ISSF members to delay and weigh in on the MSC process which, initiated by interested coastal states and fishing firms in response to retailer demand, would be costly for processing firms (ISSF members) to implement (Freitas, 2010). Second, it enabled ISSF members to turn attention away from its members own raw material demand practices in favor of emphasizing the importance of RFMO-based management for addressing environmental conditions. Notably, RFMO measures are slow to emerge and when they do, they apply evenly to all ISSF members and their suppliers.

Scientists, managers and industry alike identify excessive fishing capacity, represented by the growing number, size and technical development of vessels in tuna fisheries, as a major driver of overfishing and degradation of marine resources (Joseph, 2003). Despite this concern, capacity has continued to grow steadily. ISSF has positioned itself as a leader in addressing the ‘capacity problem’ (ISSF et al., 2010). In an effort to halt a surge in boat building in the late 2010s, ISSF members collectively adopted a resolution to ‘refrain from transactions in skipjack, bigeye and yellowfin tuna caught by large scale purse vessels that are not actively fishing for tuna as of December 31, 2012’ (ISSF Measure 6.1). To ‘govern’ the resolution, ISSF developed the Record of Large-Scale Purse Seine Vessels and required vessels to register in order to be eligible to sell to ISSF companies. Further, a vessel has to be on the Record to be listed on a second ISSF registry, the Pro-Vessel Registry (PVR). PVR Listing requires

compliance with ISSF-defined 'sustainable' production conditions. ISSF suggests that the PVR can assist processors, traders and other seafood buyers to identify vessels that are making sustainability efforts, though the onus for complying with ISSF-defined measures rests firmly on fishing firms. These capacity-related measures enable ISSF to limit the number of operational vessels, select its historical suppliers as those that will continue to be operational, and then further delineate the definition of sustainable extraction practices by defining conditions for the PVR. In practice, however, rather than limiting capacity (and related supply), ISSF's move generated a boat building and registration rush prior to the end of 2012 deadline (Villegas and Smith, 2016).

ISSF is a second form of association among mid-level firms in the tuna value chain that enables concentrated processing firms to increase their power in the value chain by generating new forms of environmental governance and engaging with existing forms in order to represent their interests. This particular inter-firm strategy of association may or may not alter the environmental conditions of production in the direction of limiting catch or other ecological problems, however ISSF enables a sum of horizontal competitors to collectively gain both power and representation.

### *Retail*

For retailers, 'the environment' presents risks and opportunities related to supply continuity, reputation and competition with other retailers, dynamics that are intensified by advocacy groups frequently targeting supermarkets because their buying power offers potential to use procurement to effect production relations (Greenpeace, 2015; Klooster, 2005). Inter-firm strategies related to corporate centralization are core in generating and managing such risks and opportunities.

Supermarkets use two related inter-firm strategies to directly engage the environmental conditions of production: 1) committing to purchase seafood certified as 'sustainable' by a third party – often MSC, the leading capture fisheries eco-label; and, 2) reforming internal procurement practices around environmental criteria. Both are predicated on market power over suppliers that is underpinned by highly centralized ownership. Both also emphasize suppliers' fish extraction practices, rather than the volume of sales model core to the retail business model. Buyers and retailers apply these inter-firm strategies differently, reflecting distinct cultures of corporate governance and consumption. On the former, third party

certification is the most well-known inter-firm strategy (e.g. Ponte 2012). Several Northern European and North American retailers have made commitments to selling MSC tuna product, some publically and others privately, but have not been able to adopt MSC commitments more broadly in part because of a dearth of certified producers of MSC product (and related chain of custody certification) to ensure continuity and volume of supply (Leadbitter and Benguerel, 2014). The second approach, unilateral commercial standards based on environmentally-focused procurement policies, are also enabled by lead-firm market power and is a more generalized strategy among Northern European and North American big retail. To meet these commitments, retailers frequently apply procurement policies to their own private label. Supermarkets specify and commit to procure products from supplier firms that abide to specific standards; usually selective capture methods (pole and line as opposed to large scale purse seine catch) or that avoid tuna caught using ever-intensifying extractive technologies (e.g. firms that fish on fish aggregating devices, FADs).

For both strategies, in theory, large retailer demand for MSC product will drive more tuna fishing and processing firms (as well as resource owners) to seek certification and, in turn, generate ecological improvements and potential price premiums for suppliers. The MSC process offers those firms that have the capacity to comply an opportunity to gain sales in an emerging market segment, and more general reputational gains. As retailers have sought to control inter-firm relations around sustainability, not all supplying firms have simply complied. For example, as pole-and-line procurement policies grew in the early 2010s, ISSF commissioned a report that raised questions about the sustainability of the bait fisheries that are required to support the pole-and line technique (Gillett, 2011); the pole and line technique does not offer enough supply to feed ISSF members' large processing capacity.

In addition to upstream expressions of power, the complex drivers of such retailer sustainability commitments include horizontal inter-firm competition at the retail node. For example, in early 2011, Greenpeace was developing its sustainability ranking of UK canned tuna brands. Upon discovering that it was to receive the worst ranking for its private label, Tesco switched its procurement policy a day before the public release to improve its ranking against competitors.<sup>22</sup> The immediate effect was a dramatic increase in the price of the very limited global supply of pole and line caught tuna. Retailers have become environmental governors by deploying lead-

---

<sup>22</sup> Various person. comms, EU industry and NGO representatives 2011, 2013 and 2014.

firm status to manage inter-firm relations in the tuna value chain. Under pressure for their role in the depletion of tuna resources, big retail uses buyer power translated through private standards to manage competition with other retailers and with their suppliers in ways that limit their risk and generate competitive opportunities associated with the very environmental problems that they have contributed to creating through chain governance models premised on centralization, low price and high volume. Retailers have selectively created environmentally-oriented inter-firm strategies that are enforced by virtue of their market power, while avoiding directly addressing the volume-based origins of the problem at hand.



## **6. Conclusion**

Over the course of ten years of research on tuna value chains, we have noted two areas of ‘governance’ of interest to economic geographers – chain governance and environmental governance – simultaneously in play in our case, but lacking an analytical tool to bridge them conceptually. Arguably this divide pervades economic geography scholarship more broadly. We have sought to develop conceptual advances on governance in value chain scholarship and meld them with a historical materialist method to bridge this divide. The result offers insights to both value chain thinking and to understanding the nature and origins of pressing ‘environmental’ changes – not to mention the vexing challenges that now typify state- and non-state based efforts to achieve more sustainable production systems.

We built from and broadened GVC governance and GPN emphasis on inter- and extra-firm strategies with an emphasis on methodological sensitivity to historical processes of contingency, contestation and change among capitals in competition. We develop the category of inter-firm strategies as a synthetic, proximate concept to group insights on the varied mechanisms of struggle over the distribution and appropriation of value among enterprises. This approach enables us to look at how value chains and the environmental conditions of production are mutually constitutive. That is, rising from the concrete categories necessary to explain our empirical research, we have been able to explore how inter-firm strategies – centralization, chain governance, standards and association – work both in combination with existing power dynamics in chains and implicitly and explicitly with and through the environment. These examples of inter-firm strategies are not exhaustive, for example, financialized mechanisms are missing from the analysis here, and we focus on inter-firm relations to the exclusion of thorough analysis of firm relations with states (e.g. through political lobbying) and other institutional actors (such as tuna regional fisheries management organizations).

Our analysis reveals that chain governance and environmental governance are not only imbricated, but inseparable and mutually constituted. The downstream chain governance that emerges from dynamics of concentration and centralization (a classic GVC story of chain governance as drivenness) yield an imperative for high volumes of raw material, which in turn shape fishing

practices and state-led efforts to limit fishing effort and total volumes removed from the oceans. Meanwhile, through the development and deployment of environmentally-oriented standards and association, firms strategically meld the environmental conditions of production and existing chain dynamics (e.g. levels of centralization) to express control over other firms and/or improve their horizontal and/or vertical competitive position relative to other firms. Importantly, these strategies are deployed not only by lead firms, but also by less powerful firms in less consolidated nodes of the chain. Each strategy works through the *combination* of inter-firm strategy and environmental conditions of production. This layered optic reveals the diversity of strategies that firms use to influence other firms and situates them within the gravitational tendencies of the larger socio-ecological totality of capitalism.

Our findings raise important questions for resource managers, or what is usually separated out from global value chains as ‘environmental governance’. The analysis shows that the target of state-led fisheries management activities – fishing capital’s activities – are shaped simultaneously by its direct articulation with the resource and its governance *and* by the implicitly and explicitly ‘environmental’ dimensions of control relations in value chains. This perspective helps to unpack the complications of resource management by revealing what fisheries managers are tasked with managing: complex fishing firms, as well as the ways that these firms reflect and refract dynamics emanating from the entire chain. Our findings also suggest that the work of state-led fisheries management bodies, including RFMOs, is becoming more deeply politicized as downstream firms argue that RFMOs are the *principal* site for contending with deteriorating environmental conditions, even as they continue their own high-volume business models. This means that firms are increasingly interested in influencing RFMOs which are not structurally designed to engage with or regulate the competitive dynamics of capital.

Exploring how inter-firm strategies work with and through environmental governance unleashes a powerful possibility of value chain analysis that has not been adequately explored. It illuminates that accumulation in the tuna value chain, as in other natural resource sectors (albeit in different ways), necessarily works *through* the ocean, tuna populations, the production and exchange relations that feed upon them and the new and emerging inter-firm strategies that firms use to manage them: what we have called the environmental conditions of production. It shows that chain

governance and environmental governance are mutually constitutive, problematizing the additive theorizing that typifies much value chain work that considers impacts ‘on’ the environment, and broadening theories of inter-firm strategies and power relations so as to connect them to the historical and geographical contexts in which they are formulated.

## References

Bair, J. (2005) ‘Global capitalism and commodity chains: looking back, going forward’, *Competition & Change*, 9 (2), 153–80

Bair, J. and F. Palpacuer 2015, ‘CSR beyond the corporation: contested governance in global value chains’, *Global Networks*, 15 (supplemental issue): S1–S19

Bakker, K., 2012. The matter of nature in economic geography, in: Barnes, T.J., Peck, J., Sheppard, E. (Eds.), *The Wiley Blackwell Companion to Economic Geography*. Wiley Blackwell, Oxford, pp. 104-117.

Bamford, V., 2014. Tesco continues to delist Princes products, *The Grocer*.

Bernstein, Henry, 1996. ‘The Political Economy of the Maize Filière’. *Journal of Peasant Studies*, 23 (2-3): 120-145

Bolwig, S., Ponte, S., Du Toit, A., Riisgaard, L., Halberg, N., 2010. Integrating Poverty and Environmental Concerns into Value-Chain Analysis: A Conceptual Framework. *Development Policy Review* 28 (2), 173-194.

Bracking, S., 2009. Hiding conflict over industry returns: A stakeholder analysis of the Extractive Industries Transparency Initiative, Working Paper 91. Brooks World Poverty Institute, Manchester.

Bridge, G., 2008. Global production networks and the extractive sector: governing resource-based development. *Journal of Economic Geography* 8 (3), 389-419.

Burt, S., Sparks, L., 2003. Power and competition in the UK retail grocery market. *British Journal of Management* 14 (3), 237-254.

Campling, L. 2012. 'The Tuna 'Commodity Frontier': Business Strategies and Environment in the Industrial Tuna Fisheries of the Western Indian Ocean', *Journal of Agrarian Change*, 12(2-3): 252-278

Campling, L., Havice, E., 2015. WCPO purse seine industry pushes for up to two months global closure. *FFA Trade and Industry News* 8 (2).

Chayanov, A.V., 1966. *The Theory of Peasant Economy*, eds D. Thorner, B. Kerblay and R.E.F. Smith. Homewood, IL: The American Economic Association

Clapp, J., Helleiner, E., 2012. International political economy and the environment: back to the basics? *International Affairs* 88 (3), 485-501.

Comitini, Salvatore 1987, 'Japanese Trading Companies: Their Possible Role in Pacific Tuna Fisheries Development', in David J. Doulman ed., *The Development of the Tuna Industry in the Pacific Islands Region: An Analysis of Options*, Honolulu: East-West Center.

Coe, N.M., Yeung, H.W.-c., 2015. *Global Production Networks: Theorizing Economic Development in an Interconnected World*. Oxford University Press, Oxford.

Dauvergne, P., Lister, J., 2013. *Eco-business: a big-brand takeover of sustainability*. MIT Press, Cambridge.

Daviron, B., Gibbon, P., 2002. Global commodity chains and African export agriculture. *Journal of Agrarian Change* 2 (2), 137-161.

Daviron, B., Ponte, S., 2005. *The Coffee Paradox*. Zed Books, London.

De Marchi, Valentina, Eleonora Di Maria and Stefano Ponte 2013, 'The greening of global value chains: Insights from the furniture industry', *Competition & Change*, 17(4): 299-318.

Durand, C., Wrigley, N., 2009. Institutional and economic determinants of transnational retailer expansion and performance: A comparative analysis of Wal-Mart and Carrefour. *Environment and Planning A* 41, 1534-1555.

FAO 2016. *The State of World Fisheries and Aquaculture 2016: Contributing to food security and nutrition for all*. Rome: FAO

Freidberg, S., 2007. Supermarkets and Imperial Knowledge. *Cultural Geographies* 14 (3), 321-342.

Freitas, N., 2010. MSC certification of PNA skipjack possible threat to ISSF members, Atuna.

Gellert, P.K., 2003. Renegotiating a Timber Commodity Chain: Lessons from Indonesia on the Political Construction of Global Commodity Chains. *Sociological Forum* 18 (1), 53-84.

Gennet, S., Howard, J., Langholz, J., Andrews, K., Reynolds, M.D., Morrison, S.A., 2013. Farm practices for food safety: an emerging threat to floodplain and riparian ecosystems. *Frontiers in Ecology and the Environment* 11 (5), 236-242.

Gereffi, G., Korzeniewicz, M., 1994. *Commodity Chains and Global Capitalism*. Greenwood Press, Westport.

Gereffi, G., Humphrey, J., Sturgeon, T., 2005. The Governance of Global Value Chains. *Review of International Political Economy* 12 (1), 78-104.

Gibbon, P., Ponte, S., 2005. *Trading Down: Africa, Value Chains and the Global Economy*. Temple University Press, Philadelphia.

Gibbon, P., J. Bair, and S. Ponte, 2005. Governing global value chains: an introduction, *Economy and Society*, 37(3)

Gillett, R., 2011. The promotion of pole-and-line tuna fishing in the Pacific Islands: Emerging issues and lessons learned, ISSF Technical Report 2011-08. International Seafood Sustainability Foundation, McLean.

Goger, A., 2013. The making of a 'business case' for environmental upgrading: Sri Lanka's eco-factories. *Geoforum* 47 (June), 73-83.

Greenpeace, 2015. Ensuring sustainable seafood. <http://www.greenpeace.org/usa/oceans/sustainable-seafood/>, accessed 23 July.

Hamby, J., 2009. The future of tuna - an indication based on recent investments, European Tuna Conference, Brussels.

Hamilton, A., Lewis, A., McCoy, M.A., Havice, E., Campling, L., 2011. Market and Industry Dynamics in the Global Tuna Supply Chain. Pacific Islands Forum Fisheries Agency, Honiara.

Havice, E., 2009. Shifting Tides: The Political Economy of Tuna Extraction in the Western and Central Pacific Ocean, *Environmental Science, Policy and Management*. University of California-Berkeley, Berkeley, p. 346.

Havice, E., 2013. Rights-based management in the Western and Central Pacific Ocean tuna fishery: Economic and environmental change under the Vessel Day Scheme. *Marine Policy* 42 (November), 259-267.

Havice, E., Campling, L., 2010. Shifting tides in the Western Central Pacific Ocean tuna fishery: The political economy of regulation and industry responses. *Global Environmental Politics* 10 (1), 89-114.

Havice, E., Campling, L., 2013. Articulating upgrading: island developing states and canned tuna production. *Environment and Planning A* 45 (11), 2610-2627.

Havice, E., Campling, L., McCoy, M., 2015. WTPO extends purse seiners' time in port to reduce tuna supply. *FFA Trade and Industry News* 8 (3).

Havice, E., Reed, K., 2012. Fishing for Development? Tuna Resource Access and Industrial Change in Papua New Guinea. *Journal of Agrarian Change* 12 (2&3), 413-435.

Hughes, A., 1996. Retail restructuring and the strategic significance of food retailers' own labels: a US-UK comparison. *Environment and Planning* 28, 2201-2226.

ISSF, UCSDCEE, IGCC, FFA, 2010. Bellagio Framework for Sustainable Tuna Fisheries: Capacity Controls, Rights-based Management and Effective MCS, Bellagio.

ISSF, 2013. Enabling sustainability through engagement and advocacy: ISSF 2013 Annual Report.

ISSF, 2014a. Report of ISSF Capacity Transfer Workshop, Barcelona.

ISSF, 2014b. Who we are - our story.

ISSF, no date. ISSF Strategic Plan 2013-2017. International Seafood Sustainability Foundation.

Jackson, S., 2011. MSC Statement of Objection - New Zealand Albacore Troll Fishery. MSC Notice of Objection.

Jeppesen S and Hansen MW 2004, 'Environmental upgrading of third world enterprises through linkages to transnational corporations: Theoretical perspectives and preliminary evidence', *Business Strategy and the Environment*, 13(4): 261–274.

Joseph, J., 2003. Managing fishing capacity of the world tuna fleet, FAO Fisheries Circular No. 982. United Nations Food and Agriculture Organization, Rome.

Khattak, Amira, Christina Stringer, Maureen Benson-Rea and Nigel Haworth 2015, 'Environmental upgrading of apparel firms in global value chains: Evidence from Sri Lanka', *Competition & Change*, 19(4): 317–335

Klooster, D., 2005. Environmental certification of forests: The evolution of environmental governance in a commodity network. *Journal of Rural Studies* 21 (4), 403-417.

LaFreniere, M 2015, 'Canned tuna price-fixing class action lawsuit consolidation into MDL', *Top Class Actions*, 14 December.

Leadbitter, D., Benguerel, R., 2014. Sustainable tuna - can the marketplace improve fishery management? *Business Strategy and the Environment* 23, 417-432.

Levy, D., Newell, P., 2005. *The Business of Global Environmental Governance*, Global Environmental Accord. MIT Press, Cambridge.

Lin, G., 2012. Global M&A trends and implications for the tuna industry, *Infofish Tuna 2012*, Bangkok.

Lischewski, C.D., 2006. The U.S. Market for Shelf Stable Tuna: An Update, in: Subasunghe, S., S. Pawiro and S.M. Anthonysamy (Ed.), *Tuna 2006: 9th Infofish World Tuna Trade Conference and Exhibition*. Infofish, Bangkok, pp. 132-140.

Lodge, M.W., Anderson, D., Løbach, T., Munro, G., Sainsbury, K.J., Willock, A., 2010. *Recommended Best Practices for Regional Fisheries Management Organizations: Report of an Independent Panel to Develop a Model of Improved Governance by Regional Fisheries Management Organizations*. Chatham House, London.

McCarthy, J., 2004. Privatizing conditions of production: trade agreements as neoliberal environmental governance. *Geoforum* 35 (3), 327-341.

McGowan, M., McClain, K., 2010. *Global Tuna Demand Workshop: Market and Cannery Overview*.

Meckling, J., 2015. Oppose, support, or hedge? Distributional effects, regulatory pressure, and business strategy in environmental politics. *Global Environmental Politics* 15 (2), 19-37.

Melbourne, D., 2014. North America Ambient Seafood and Tuna, *Infofish Tuna 2014*, Bangkok.

Mezzadri, Alessandra 2012. Reflections on Globalisation and Labour Standards in the Indian Garment Industry: Codes of Conduct Versus 'Codes of Practice' Imposed by the Firm. *Global Labour Journal*, 3 (1): 40-62.

Mitchell, J., 2014. *Carting away the oceans VIII: 2014 Rankings of Seafood Sustainability in US Supermarkets*. Greenpeace, Washington DC.

Moore, J. W. 2015, *Capitalism in the Web of Life: Ecology and the Accumulation of Capital*, London: Verso

Morón, J., 2002. The world tuna purse seine fishery and the WTPO, in: Subasinghe, S., Pawiro, S. (Eds.), *Global Tuna Industry Situation and Outlook: Resources, Production & Marketing Trends and Technological Issues*. INFOFISH, Kuala Lumpur.

Newell, P., Paterson, M., 1998. A climate for business: global warming, the state and capital. *Review of International Political Economy* 5 (4), 679-703.

Neilson, J., Prichard, B., 2009. *Value Chain Struggles: Institutions and governance in the plantation districts of South India*. Wiley-Blackwell, West Sussex.

OECD, 2003. *Environmentally Harmful Subsidies: Policy Issues and Challenges*. Organisation for Economic Cooperation and Development, Paris.

Österblom, H., Jouffray, J.-B., Folke, C., Crona, B., Troell, M., Merrie, A., Rockström, J., 2015. Transnational Corporations as 'Keystone Actors' in Marine Ecosystems. *PLoS ONE* 10 (5).

Ponte, S., 2012. The Marine Stewardship Council (MSC) and the Making of a Market for 'Sustainable Fish'. *Journal of Agrarian Change* 12 (2-3), 300-315.

Ponte, S., Sturgeon, T., 2014. Explaining governance in global value chains: A modular theory-building effort. *Review of International Political Economy* 21 (1), 195-223.

Pulver, S., 2002. Organising Business: Industry NGOs in the Climate Debates. *Greener Management International* 39 (September), 55-67.

Reardon, T., Timmer, P., Minten, B., 2012. Supermarket revolution in Asia and emerging development strategies to include small farmers. *Proceedings of the National Academy of Sciences* 109 (31), 12332-12337.

Selwyn, B., 2012. Beyond firm-centrism: re-integrating labour and capitalism into global commodity chain analysis. *Journal of Economic Geography* 12 (1), 205-226.

Spruyt, N., 2000. Private labels vs. supermarket brands in the UK, in: Subasinghe, S., Sudari, P. (Eds.), *Tuna 2000 Bangkok: Papers of the 6th World Tuna Trade Conference*. INFOFISH, Bangkok.

StarKist, 2001. Prehearing statement of StarKist Samoa, Inc, Special Industry Committee No. 24 for All Industries of American Samoa. US Department of Labor, Wage and Hour Division, Washington DC.

Starosta, G., 2010. Global commodity chains and the Marxian law of value. *ANTIPODE* 42 (2), 433-465.

Tarte, S., 2002. The European Union and the Western and Central Pacific Tuna Fishery, Thirteenth Europe Pacific Solidarity Seminar, Strasbourg.

Tsing, A.L., 2005. *Friction: An ethnography of global connection*. Princeton University Press.

USDA, 2015. Retail Trends, United States Department of Agriculture Economic Research Service.

Villegas, A., Smith, J., 2016. ISSF vessel registry seen as having 'wrong result', Undercurrent News.

WCPFC Scientific Committee, 2015. Scientific Committee Seventh Regular Session: Summary Report, Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean.

World Bank, 2009. *The Sunken Billions: The Economic Justification for Fisheries Reform, Agricultural and Rural Development Sustainable Development Network*. The World Bank, Washington, DC.

World Bank, 2010. *The Hidden Harvests: The Global Contribution of Capture Fisheries* (conference edition). Washington, DC: World Bank