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Natural Resources and Global Value Chains:
What Role for the WTO?

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Natural resources are critical to global value chains. Minerals, rare earths, good climate and fertile soil are commonly required for the beginning of the chain, with the consequence that any interruption in their supply threatens the entire chain's integrity. (Liu and Maughan: 2012). Trade in such resources provides a valuable source of income for resource-rich states. Yet, over exploitation results in exhaustion and biodiversity loss, and extraction may cause environmental damage and human rights problems. Consequently, any positive contribution to resource-rich states' sustainable development is quickly undermined. Effective regulation is critical to maximize benefits and minimize potential harm therefore.

At its heart, any global value chain is predicated on the up and downstream trade in the goods and services. The World Trade Organisation's (WTO) rules remove unnecessary restrictions to trade in natural resources, but permits domestic regulation under certain conditions. At first glance, the rules allow states to impose measures that militate against over-exploitation of the resource, whilst ensuring that regulation does not unnecessarily impede the flow of resources within the value chain (EC-Seals Appellate Body: 2014, para 5.127).[2]

It will be argued below that the WTO rules' application to natural resource use in global value chains is problematic. Substantive challenges arise because the rules' application to one state's regulation is experienced in diverse and unpredictable ways all along the supply chain, with the result that often the rules do not support the state's attempts to alleviate the harm suffered. Normative challenges also arise because the rules' are commonly thought to address different problems to those found in global value chains. For example, important rules, like Articles I and III of the General Agreement on Tariffs and Trade (GATT) covering non-discrimination are designed to prevent states from closing their markets to imported goods in order to create equality of competitive opportunities between 'like' products irrespective of their origin (EC-Seals Appellate Body: para 5.82; Cho & Kelly: 2013).[3] As trade becomes more integrated, export controls are

[1] University of Warwick. With thanks to Danae Azaria and two anonymous reviewers for their comments on an earlier draft.
[2] European Communities-Measures Prohibiting the Importation and Marketing of Seal Products, WT/DS400 & DS401/AB/R, 22 May 2014: para 5.127.
[3] The rules on trade in services work slightly different, but note the equivalent non-discrimination rules in Articles II, XVI, XVII GATS. The aim of the WTO rules is contested.

increasingly disruptive to the chain, yet they are inadequately regulated by the WTO (Karapinar: 2011). Private actors like multinational corporations, such as Wal-Mart, CocaCola and Heinz, dominate trade and their activities can undermine the sustainable use of natural resources. Nevertheless, the WTO's rules do not impinge directly on such corporations' practices as the rules are contained in an international treaty unsurprisingly predicated primarily on the activities of states and 'separate customs territories possessing full autonomy of [their] external commercial relations.'(Article XII Marrakesh Agreement Establishing the WTO).

As dominant corporations exert greater control over trade flows, the challenge is not only to think about whether the WTO rules should be amended to address private actors' domination of this perceived public regulatory space. Rather, it is first necessary to understand how the existing WTO rules work in this new world. For, to look at global value chains in a controversial area like natural resources is to consider the way the corporation organizes its business activities and the drivers and constraints on those activities: that is, the space the corporation is operating in. This is an economic (sectoral), geographic and a legal space. If we think of the WTO rules working within this space, rather than the corporation working solely within the *WTO's* regulatory space, then the WTO rules are simply one of many constraints on corporate behaviour, some of which are self-imposed, like corporate social sustainability for example. Thinking about the WTO rules' impact on natural resource use in global value chains in this way means a radical re-imagination of its rules may not in fact be necessary. This article is a first step to re-thinking how the WTO rules work in a world dominated by corporate power. The discussion offers some general thoughts in the context of natural resources, but leaves more sustained discussion of how these issues play out in every WTO Agreement for later work.

1. Global Value Chains, Natural Resources and Sustainable Development

The terms 'global supply chain' and 'global value chain' are used synonymously in the literature, although global value chain scholarship grew out of the earlier work on global supply chain (Gereffi & Lee, 2012, p25). Global supply chain scholarship interrogated the organization and governance of the chain as a whole, whereas global value chain evaluated how to isolate and capture the 'value' at each stage of the chain (Gereffi, Korzeniewicz, & Korzeniewicz: 1994, p1). 'Global value chain' is used throughout this article because it captures the complex interactions between participants in the chain.

Global value chains are not a new phenomenon, but were first seen in 1960s, when globalization altered competition between firms from the local to the international stage, thereby facilitating a

change in production methods (Gereffi & Lee, 2012, p.25). From the 1960s, US companies in particular sliced up their value chains and outsourced key stages of production to lower overall production costs to maximize corporate profits (Gereffi & Lee: 2012, p.25). From simply outsourcing the assembly of US car parts to Mexican workers to take advantage of cheap Mexican labour costs, value chains became more complex and most intermediate production of consumer goods is now subject to outsourcing of one type or another. This too is marked by a shift in organization of value chains from the simple producer-driven chain like that of the US-Mexican car part assembly where the power is held by the main manufacturer of the product, to the complex buyer-driven chains where power is held by the dominant retailers like Wal-Mart and global brand owners like Coca-Cola and value is added at each stage of the long value chain (World Economic Forum: 2013, p.25; Dauvergne and Lister: 2012, p37).

New global value chain models are emerging as corporations decide how best to guarantee the supply of goods and services up and downstream in the chain (Gereffi, Humphrey, & Sturgeon: 2005). For example, the dominant corporation may decide to internalize all, or some key aspects of its value chain activities through foreign direct investment (FDI) where the dominant company itself invests in assets for the purposes of production in a country separate to that in which it has its corporate seat (Jägerskog, et al: 2012, p14; Cotula: 2014, p.4). This happens if it is difficult for the company to guarantee the security of its intellectual property due to weak national legislation within the potential supplier's jurisdiction, or if the dominant company has been unable to enter into key supply contacts with fully independent local suppliers through arms-length transactions (World Investment Report: 2013, p142). For example, large-scale acquisition of natural resources like land by the dominant company for the purposes of agricultural production for food and biofuel is a common form of FDI in short agri-food global value chains (Häberli & Smith: 2014, p195).

Value chains may be constructed in more complex ways: these so-called "non-equity modes of governance," (NEMs) take many forms: for example, the dominant company may issue a comprehensive formal set of instructions to its supplier that governs precisely how a particular input to the chain should be created including the product's technical specification and any labour/environmental standards to be maintained during the production process (World Investment Report: 2013, p142). The objective in this 'captive' NEM relationship is to strengthen the local supplier's capability to feed their product more efficiently into the chain without the continued and costly intervention of the dominant supplier; a strategy designed to reduce transaction costs and maximize profits in the longer term. The degree of interdependence between the dominant supplier and the local producer in captive NEMs can be such, that in some cases, it appears the local supplier

is in fact a subsidiary of the dominant company, although this may not be the case (World Investment Report: 2013, p144). The dominant company may equally organize its value chain relationships so it can swap between many competent suppliers to enable it to choose the best product needed for production at any point in time (i.e. modular NEM: World Investment Report: 2013, p144). Local suppliers can then supply dominant companies in other value chains too, with the consequence that it is difficult to regard that supplier as fitting into a single global value chain because it could be a key part to a number of chains. Joint ventures are also very common corporate structures where the relationship between companies is dependent on the mutual exchange of know-how crucial to the relevant input to the chain.

Natural resources are crucial to global value chains in a number of ways. In terms of primary agricultural resources like grain and cotton, trade liberalization following the successful conclusion of the Uruguay Round of multilateral trade talks in 1995 and the introduction of the Agreement on Agriculture in particular, led to the large-scale reduction in market access restrictions, domestic and export subsidies that adversely affected developing countries' agricultural products' ability to penetrate developed country markets (McMahon: 2006). The combination of lower trade barriers and low world commodity prices enabled developing countries to capitalize on their comparative advantage in agricultural production, especially in good climate and labour costs, to produce non-seasonal food like fruits and vegetables in dedicated export processing zones for export to developed country markets (Guarin: 2013, p3). Availability of such off-season fresh produce is very attractive to large buyer-driven global supply chains like Wal-Mart and Tesco because they can guarantee the continued supply of such produce for consumers throughout the year irrespective of the crops' natural growing cycle (Dauvergne & Lister: 2012, p37).

Food retailers use their market power to redefine their relationships with suppliers who must enter into contractual agreements controlling price, quality and volumes over specific time periods (Guarin: 2013, p3). Squeezing costs out of the supply chain and pushing them on to the producer can have positive effects for the producer as it encourages expansion in agricultural production into large-scale industrial style farming to enable the farmer to take advantage of economies of scale, which in turn increases the farmer's profits (World Investment Report: 2013, p161). Likewise, the guarantee of a buyer for each crop guarantees a regular income for the farmer, and thus is a strong contributor to poverty reduction. Small agricultural producers may be able to access a global value chain too if the chain is highly fragmented and the dominant company seeks supply from many different sources to meet its demand (Lee & Gereffi: 2012, p12327. For example, smallholders may supply into global value networks predicated on certain production standards, like 'Fair Trade.'

Smallholders producing products like coffee eligible for the 'Fair Trade' certification are guaranteed a fair price at a fixed minimum as well as continued trading relationships with their buyers (Daviron & Ponte: 2005, p173-177; FLO-CERT GmbH: 2014).

The overall benefits of global value chains to local agricultural producers may be more apparent than real as questions remain precisely who keeps the profits in such an arrangement, especially as the point of such 'outsourcing' by the supermarket is to keep prices low for the ultimate consumer (Guarin: 2013, p3). Labour costs remain prohibitively low, sometimes achieved at the price of violation of local labour laws and human rights (United Nations: 2012, para 1). For example, Coca-Cola's supply chain relies heavily on sugar from Brazil with over 46% of Coke's sugar requirement sourced from there (Locke & Cosolovsky: 2013, p6). The sugar industry is very labour intensive, with very poor labour standards caused, at least in part, by the drive to lower sugar production costs. In 2012, the United States Department of Labor reported the common use of forced labour, poor living conditions, long shift patterns with no sun protection for workers, as well as the use of child labour (United States Department of Labour: 2012, p33). Use of migrant workers too is common. Such workers live in communal dorms; wages are very poor and brutally harsh working conditions mean health problems are common (Blanding: 2005).

In other areas of agricultural production, farmers may be locked into using specific varieties of crop for the dominant buyer in the supply chain. The farmer may 'choose' to use patent protected hybrid varieties because they maximize yields which can be supplied direct into the food supply chain for further processing, or alternatively may be supplied into a different value chain for biofuel production like ethanol for example. However, the constant demand for corn in the ethanol chain means that farmers are incentivized to move away from inter-cropping to monoculture, with the consequent loss of biodiversity and soil degradation (Pollan: 2011, p45-50). And, because further soil deterioration requires crops that are more pest resistant, or which can grow in exhausted soil, the producer is forced to buy the hybrid variety and use more fertilizer at greater cost both to the farmer and the environment (Pollan: 2011, p55). These problems are evident too when the use of a specific crop variety is a legal requirement in the supply contract between the farmer and the dominant buyer in the supply chain. For example, Heinz only uses specific tomato varieties sourced under contract from a limited number of growers (Lee, Gereffi & Beauvais: 2012, 12329). These tomatoes have been developed specifically for product quality and efficient processing and no other varieties are used. Such production is both economically and environmentally unsustainable.

Growing demand for natural resources, especially agricultural produce for the agri-food global value chains, sees some dominant buyers undertaking large-scale land acquisitions (i.e. agri-FDI), especially in Mozambique, Kenya and Ethiopia (Deininger et al: 2011). In 2011, the World Bank reported that farmland acquisitions rose from an average annual acquisition of 4 million hectares in 2008, to 56 million hectares in 2009 (Deininger et al: 2011, p.xiv). The increase was driven by the rise in investment corporations keen to capitalize on the rising commodity prices after the adverse climatic conditions affecting the 2008 harvest, but more importantly, for the purposes of this discussion, land was required to supply corn for biofuel production and to supply growing demand for vegetable oils and sugar cane for food processing (Lim & Senduk: 2012, p75). A similar story emerges for mineral extraction with large-scale investment in coke, silicon and Tungsten.

Whilst such vertical integration through FDI in countries in Sub-Saharan Africa and East Asia brings valuable investment income, technical expertise and jobs, the economic and environmental sustainability of these acquisitions is more uncertain. I have written elsewhere about the frequent reports of farmers being displaced from prime land after its acquisition, and moved onto less profitable land, with the loss of their livelihood and consequent food insecurity (Häberli & Smith: 2014). A lack of property rights in some countries means indigenous peoples are moved to make way for other production or mineral extraction. This may result in violation of their right to food, or other human rights. For example, the Alangan and Tadyawan peoples were moved from their ancestral farming lands in the Philippines to make way for the Mindoro Nickel mining project operated by Intex Resources SA without full consultation so that their human rights were violated, especially as they pertain to their culture and traditional values (Norwegian Contact Point: 2011, p5).

Global value chains present opportunities and challenges in the context of the exploitation and protection of natural resources therefore. The ability of goods, services and investment to move freely across state borders is at the heart of global value chains' success. Increasing fragmentation of production means countries rich in natural resources, but weak in extraction/exploitation know-how gain from inward FDI by single companies needing such resources for the chain. Gains can be made too from the diverse value chain structures as domestic producers receive valuable income either from joint exploitation with the dominant company because they have a guaranteed buyer for their produce, or because there are multiple diverse chains into which those producers supply. However, over exploitation of natural resources like minerals, fertile land and soil; land grab; displacement of food crops into biofuels or into exports of food; the incentive to move to monoculture with loss of biodiversity and the consequential adverse effects on the environment

particularly climate change, are all problems which must be balanced against the benefits derived from participation in global value chains. By their very nature, global value chains are international, so effective regulation must itself have an international reach. The WTO's rules are an obvious choice for this task as states will often resort to trade measures to maximise the positive effects, whilst minimising the negative effects of natural resource exploitation. For example, export quotas and minimum environmental standards for the extraction process are common. Whilst the WTO rules regulate a *state's* trade measures, their ability to stimulate positive benefits of trade in natural resources within a global value chain whilst minimising any negative effects is less certain. The next section explores the extent to which the WTO meets these challenges and where potential problems may arise.

2. Global Value Chains, Natural Resources and the WTO

The WTO is an institutional framework through which its member states (members) conduct their external trade relations with each other in accordance with multilaterally agreed rules and other legal instruments annexed to the Marrakesh Agreement Establishing the World Trade Organization (the Marrakesh Agreement).[4] There are four Annexes to the Marrakesh Agreement with Annex 1 containing rules governing trade in goods, services and intellectual property[5] and Annex 2 containing rules governing the settlement of disputes (the Dispute Settlement Understanding or DSU) being the most important.[6] Whilst an exhaustive examination of the way every WTO rule applies to each dimension of the global value chain would yield very important results, the analysis here is less ambitious. Rather the discussion centres on a number of systemic issues that show where the WTO rules may be effective and where tensions arise in the context of natural resource exploitation and use in global value chains. It should be noted too that the analysis focuses on the rules governing trade in goods in Annex 1A Marrakesh Agreement, rather than trade in services (GATS) in Annex 1B and intellectual property (TRIPS) in Annex 1C. Trade in value added relies heavily on the ability to trade in services and that respect for the intellectual property rights attached to those goods and services will be respected by importing countries. However, as the rules on goods are more developed, and for reasons of space, this article confines itself to the issues arising from the WTO's regulation of natural resources as goods and leaves other agreements to another

[4] Article II:1 Marrakesh Agreement.
[5] Annex 1A: Trade in Goods, including the General Agreement on Tariffs and Trade (GATT) 1994 and other specific rules on, for example, agriculture, anti-dumping, subsidies and safeguards; Annex 1B General Agreement on Trade in Services (GATS); Annex 1C: Trade-Related Aspects of Intellectual Property Rights (TRIPS).
[6] New WTO members may agree to additional commitment as part of their accession process, so-called 'WTO+' commitments. These commitments are contained in the new member's Accession Protocol and are subject to dispute settlement proceedings: China-Measures Affecting Imports of Automobile Parts, Report of the Panel, WT/DS339, DS340 & DS342/R, 18 July 2008, para 7.740: the parties to the dispute accepted the Accession Protocol was enforceable under the DSU and this issue was not subject to debate in either the panel or Appellate Body.

time. The discussion considers the WTO's ability to control corporate behaviour directly first and then evaluates its rules' effect on state control of natural resources.

WTO's Direct Control of Corporate Behaviour

Global value chains vary in their structure, length and overall complexity, but the important uniting feature is that in every chain corporations play a role either by controlling the overall chain, or by being participants in one or more dimensions of it. This domination by corporations poses a challenge for the WTO rules because at first glance they are predicated on state behaviour and not on that of corporations per se. Article II(1) of the Marrakesh Agreement makes it clear that the WTO rules only apply as between its members. And, only states, or separate customs territories "possessing full autonomy" in the conduct of their external commercial relations, like Hong Kong and Chinese Taipei for example, are eligible for WTO membership.[7] The DSU further reiterates the state-centric nature of the WTO's rules, stating in Article 3(2) that the DSU is designed to provide "security and predictability to the multilateral trading system" but only in a way that "serves to preserve the rights and obligations of Members under the covered agreements" (emphasis added). To the extent that corporations control and participate in the exploitation and use of natural resources, their activities would appear to be outside the direct control of WTO rules and its dispute resolution procedure.

Attempts to disguise disputes between large multinational corporations as trade disputes between members have infamously been rejected by WTO panels. Notably, in the Japan-Film dispute, the panel recognized that in fact the dispute concerned the behaviour of the US multinational corporation, Kodak, and its Japanese competitor, Fuji, and robustly refused to adjudicate on the wider corporate dispute stating that the WTO was "an international agreement in respect of which only national governments and separate customs territories are directly subject to its obligations."[8]

The panel did go on, however, and acknowledge that it was difficult to draw a bright line between a 'pure' corporate dispute and one where the acts of the corporation were attributable to the state (Japan-Film: 1998, para 1052). 'Attribution' in the panel's view arises when there is "sufficient government involvement" in the activities of the corporation, that is, where there is "some connection to, or endorsement of" the corporation's actions by the state (Moody: 2012, p1426-1432). The panel did not flesh out the test further, but indicated that it should be applied on a case-

[7] Article XII Marrakesh Agreement.
[8] Japan-Measures Affecting Consumer Photographic Film and Paper, WT/DS44/R, Report of the Panel, 31 March 1998 (Japan-Film),para 10.52.

by-case basis. There is little GATT/WTO jurisprudence on the scope of the "sufficient government involvement" test, but in Canada-Dairy, the Appellate Body argued that the actions of non-governmental actors, the Canadian Milk Marketing Boards, could be attributed to Canada partly because the power to act derived from delegation of the authority from the Canadian government and partly because the Milk Marketing Boards performed "functions of a 'governmental' character" that were legally enforceable in a court.[9] For the Appellate Body, these functions included the right to "regulate, restrain, supervise, or control the conduct of private citizens." (Canada-Dairy: 1999, para 97). Although argued in the context of another Annex 1A agreement, the Agreement on Agriculture, the Appellate Body's approach closely follows Article 5 ILC Articles on Responsibility for States for Internationally Wrongful Acts 2001 which makes it clear that "[t]he conduct of a person or entity which is not an organ of the State under article 4 but which is empowered by the law of that State to exercise elements of the governmental authority shall be considered an act of the State under international law, provided the person or entity is acting in that capacity in the particular instance." (ILC Report on the Work of its Fifty-Third Session: 2001).

Even though the connection between the state and the non-governmental bodies was not derived solely from a delegation of power from the state, this test still envisages some form of positive delegation of power from the state to the entity. Framing the test in this way means it is difficult to 'attribute' private corporations' activities to states even though those corporations may exercise "functions of a governmental character." (Canada-Dairy: see generally Villalpando: 2002). This is particularly problematic in buyer-driven global value chains as the dominant corporation often has specific natural resource exploitation and use guidelines governing the activities of its suppliers. These guidelines can include compulsory minimum environmental and labour standards (Moody: 2012, 1430-1432).

For example, following the outcry against Coca-Cola for environmental and labour rights abuses in its sugar cane production in Brazil, together with food safety scares in Europe, Coca-Cola introduced its 'Supplier's Guiding Principles' (SGPs). The SGPs require all its suppliers, including those supplying natural resources like 'raw' sugar cane, to meet eight basic standards, ranging from good workplace practices to robust environmental standards and local labour laws compliance.[10] If suppliers do not comply with the SGPs, the agreement with the supplier can be terminated (Locke & Coslovsky: 2013, p7). Coca-Cola buys approximately 8% of all sugar produced worldwide from

[9] Canada-Measures Affecting the Importation and the Exportation of Dairy Products, Report of the Appellate Body, WT/DS103 & DS113/AB/R, 13 October 1999, (Canada-Dairy) paras 97 & 100.
[10] Available at: http://www.coca-colacompany.com/our-company/supplier-guiding-principles.

its affiliate suppliers: in Brazil alone Coca-Cola buys 690,000-745,000 tonnes of sugar from over 30 different mills and accounts for over 7% of all sugar sold in the country (Locke & Coslovsky: 2013, p6). As a consequence, the SGPs have significant global as well as domestic reach. Given the potential loss of biodiversity and soil erosion caused by monocropping of sugar cane together with harsh labour conditions for those harvesting it, the SGPs should be a positive development, especially as they require local producers to comply with existing labour laws and environmental standards that exist within each state, irrespective of whether the state itself has effective judicial enforcement.

Workers harvesting sugar cane in Brazil for suppliers contracted to Coca-Cola enjoyed significantly improved working conditions following the implementation of the SGPs (Locke and Coslovsky: 2013, p13). However, the global reach of such standards means they have the potential to operate as disguised restrictions on international trade dependent on how they are administered and applied by Coca-Cola. To the extent that Coca-Cola's actions can be 'attributed' to the state rather than to a wholly private actor, the state may be in violation of other Annex 1A WTO Agreements like the Agreement on Technical Barriers to Trade (TBT Agreement).[11]

The SGPs clearly "regulate, restrain, supervise, or control the conduct of private citizens" because they set out appropriate supplier behaviour and include the sanction of termination of supply agreements in the event of violation (SGPs, para 97). But it is difficult to see a positive delegation of authority from "the state" to Coca-Cola as envisaged by the Appellate Body in Canada-Dairy simply on the ground that Coca-Cola requires its suppliers to comply with national labour, human rights and environmental laws. Any connection is coincidental and not the positive connection set out in Canada-Dairy, so there would be no liability under the TBT Agreement or the GATT (Canada-Dairy: 1999, para 100).

Even if this hurdle is overcome and a coincidental connection is sufficient, any WTO liability is attributed to the state where the connection is made, rather than to the state where the standard was originally drafted and/or where decisions about modification are made. The state where the connection is made is the one that would bear the cost of rectifying any WTO violation: Article 19(1) DSU requires that once a state is found to be in violation, it is that state which must bring the offending trade measure back into conformity with the rules. Ironically, that state may remain in violation of the WTO rules if it cannot legally require or persuade the corporation to modify its

[11] There may also be a claim under GATT: European Communities-Measures Prohibiting the Importation and Marketing of Seal Products, Report of the Panel, WT/DS400 & DS401/R, 25 November 2013 (EC Seals: 2013).

standards. And, as a result of any continued non-compliance, that state is also required to pay compensation to the 'winning' state, or, as is more usual under WTO rules, its exports to the winning state will be subject to higher tariffs as a result of the suspension of trade concessions under Article 22(6) DSU.

Given the complexity of a large multinational like Coca-Cola too, it may not be possible to determine a single geographic location for the decision in any event, meaning that it might be difficult to establish liability under the WTO rules at all as they are predicated on the existence of a measure imposed by, or attributed to a particular state.

Leaving aside this 'attribution' issue, under Articles 3 and 8 TBT Agreement a member is required also to "monitor the activities of non-governmental bodies" who are involved in the preparation, adoption and application of "technical regulations" and "standards" within its territory. And, in the case of "technical regulations" where compliance with its terms is mandatory (like Coca-Cola's SGPs), ensure that the technical regulation meets the non-discrimination rules in Article 2.1 TBT Agreement. Technical regulations also must not "prepared, adopted or applied with a view to or with the effect of creating unnecessary obstacles to international trade" in Article 2.2.[12] Whether wholly private actors like Coca-Cola are the type of "non-governmental body" envisaged by the TBT Agreement is as yet unclear as there is no jurisprudence on this point; although it seems that after US-Tuna II the fact that regulations impose standards on the process by which natural resources are extracted, exploited or used, rather than on the products themselves is no longer a reason for excluding such practices completely from the scope of the TBT Agreement.[13]

The difficulty with technical regulations and standards used in global value chains is the complexity of this monitoring requirement especially as the obligation presumably falls on each member to monitor every 'non-governmental body' operating within its jurisdiction. There are at least four main type of global value chain operating in the agri-food sector alone, ranging from buyer-driven chains to bilateral oligopolies, producer-driven chains, as well as traditional markets, and each has its own set of standards, sometimes wholly public, private or a combination of the two (Lee, Gereffi and Beauvais: 2012, p12327). This complexity makes it difficult to trace, and then monitor the

[12] On the definition of 'technical regulation' see Annex 1.1 TBT Agreement & European Communities-Measures Affecting Asbestos and Asbestos-Containing Products (EC-Asbestos), Report of the Appellate Body WT/DS135/AB/R (Mar. 12, 2001), paras 66-70. See also European Communities-Trade Descriptions of Sardines (EC-Sardines), Report of the Appellate Body, WT/DS231/AB/R (Sept. 26, 2002), para 185.
[13] See discussion in the US-Tuna II, Report of the Panel, WT/DS381/R (Sept. 15, 2011), paras 7.63-79; and United States-Measures Concerning the Importation, Marketing and Sale of Tuna and Tuna Products (US-Tuna II) Report of the Appellate Body, WT/DS381/AB/R (May 16, 2012), at paras 183-199.

'source' of the standard and technical regulation in the way assumed by Articles 3 and 8 TBT Agreement, which are designed, like all WTO rules, to address disputes where the source of the harm or problematic measure is readily discernible in a specific geographic space.

State Regulation of Natural Resources and WTO Rules

Natural resources in their unprocessed form or at a very early stage of processing play a critical role in the supply chain. For example, extracted oil feeds into every aspect of the chain from the manufacture of soaps, to its use as fuel for domestic use and transport; likewise, fertile soil is critical for the production of grains or corn for the agri-food global value chain as they are made into fresh products like bread, sweetener when refined into High-Fructose Corn Syrup, and are a key ingredient in biofuel; rare earths are a key component too in electronics manufacturing like mobile phones (China-Rare Earths: 2014, paras 2.5-2.7).[14] There is a crucial tension here, as preserving natural resources is an important policy objective for states with the resources. But natural resources are also commonly at the top (or start) of the global supply chain; meaning access to them is critical for the continuing integrity of the chain, especially the economic and social sustainability of certain aspects of production which is most likely geographically located in other states. Failure to supply down the chain may cause food shortages in net food importing states, for example like those that occurred in Mozambique and Japan, following the poor harvests in Russia and Ukraine in 2008, which are both large net exporters (Welton: 2011).

It is more likely that a state will impose measures designed to maximise trade flow so products move freely into and out of the state enabling it to gain valuable income from the 'value' derived from the fragmentation of production (OECD et al: 2013, p7). It may also restrict the levels of environmental harm caused by mineral extraction for example, or limit the level of soil erosion and biodiversity loss resulting from monoculture. As noted above, the WTO rules were crafted to reduce protectionist barriers to trade and enable goods and services to move more freely state borders (Guarin: 2013, p3).

For measures that affect imports, the critical issue is whether those measures undermine any tariff (i.e. customs duty) reductions previously negotiated as part of the multilateral trade talks (Cho & Kelly: 2013, p632). Any attempt to undermine the rules using, for example, import bans,[15] prohibitively detailed customs duties (World Economic Forum: 2013, p6), or complex rules of

[14] China-Measure Related to the Exportation of Rare Earths, Tungsten and Molybdenum Report of the Panel, WT/DS431, DS432 & DS433/R, 26 March 2014.

[15] "Russia Bans Imports of US Pork and Beef," Pravda, 11 February 2013 http://english.pravda.ru/news/business/11-02-2013/123744-russia-0/

origin that favour domestically produced goods over imported ones, must conform with the non-discrimination rules like the national treatment obligation in Article III GATT, freedom of transit in Article V GATT and general transparency requirements in Article X GATT, as well as specialist rules governing legitimate health and environmental standards like the Agreement on Sanitary and Phytosanitary Measures and the TBT Agreement (Cho & Kelly: 2013, p633). It should be noted, however, that in EC-Seals the Appellate Body indicated, in the context of Articles I and III GATT, that it is enough for the state bringing the action to show that equality of competitive opportunities for 'like' products irrespective of their origin were not provided by the importing state, rather than that there was an actual adverse trade effect per se (EC-Seals 2014: para 5.82).

This pro-market access agenda is good news for developing countries wishing to exploit their comparative advantage in fertile land and good climate in order to export primary produce like fruits and vegetables. Global value chains, dominated by powerful supermarkets like Wal-Mart and Tesco provide crucial outlets for such products and income for domestic producers, which contribute to the economic and social sustainability of their production. And, as the notorious 'ash cloud' demonstrated in April 2010, albeit in the context of an inability to physically deliver goods from developing countries into key supply chains during the air embargo imposed at the time, the cost to developing countries like Kenya and Tanzania ran to £1.9m and £250,000 per day respectively (Jamieson: 2010). The WTO's market access rules for goods facilitate access further up the value chain too for developing countries keen to use the income derived from natural resources exports in order to channel funding into other more lucrative processing points higher up in the chain for example (World Investment Report: 2013, p131). The current Doha Development Round of multilateral trade talks equally grasps the importance of strengthening market access rules by further reducing market access restrictions on agricultural products in particular, as well as moving forward on the trade facilitation agenda by speeding up the "movement, release and clearance of goods," whether in transit or not along the supply chain (Eliason: 2014).[16] Removing further supply chain barriers to trade (even if at a rate of only 2 per country) could add nearly 5% (US$2.6 trillion) to global GDP and 15% (US$1.6 trillion) to global trade (World Economic Forum: 2013, p5).

More problematic are the WTO rules' impact on a state's use of import and export restrictions deployed to encourage a global move towards a pro-sustainability agenda. Such measures might be aimed at ameliorating the consequences of dominant corporations' cost reduction strategies that

[16] WTO: 'Doha Ministerial Declaration 2001,' WT/MIN(01)/DEC/1, 20 November 2001, para 27. See current stage of negotiations at http://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm.

have the potential to cause environmental harm and human rights abuses of workers involved in natural resource extraction. A state imposed measure designed to prevent or restrict imports of minerals or rare earths that have not been exploited in line with clearly defined sustainability criteria for example, may violate Article XI:1 GATT because it operates as a "prohibition or restriction other than duties or taxes made effective through quotas" on goods.[17] Article XI.1 also applies to prohibitions and restrictions on natural resource exports (China-Rare Earths: 2014 paras 7.7.139-7.195 & 7.236-7.362). Two GATT panels, Japan-Semi-Conductors and EEC-Fruit reiterated this view and found that Article XI:1 applied identically to both imports and exports as both types of measure have the ability to change the conditions of trade between states.[18] Such measures can be found to violate Article XI:1 even though they are not overt export measures, but rather operate in a de facto way to restrict exports.[19]

Article XI:2(a) GATT allows states to impose export restrictions "temporarily" to either "prevent or relieve critical shortages of "foodstuffs or other products essential to the exporting party" the latter, for the purposes of this discussion, includes natural resources like minerals and rare earths; or under Article XI:2(b) if such restrictions are "necessary to the application of standards or regulations for the classification, grading or marketing of commodities in international trade." Article XI:2(a) and (b)'s protection only stretches to an escape from sanctions, and the state cannot impose the restrictions in a discriminatory manner (Article XIII:1 GATT). In China-Raw Materials, the Appellate Body found that a measure is "temporarily applied" for the purposes of Article XI:2(a) when it is an interim measure imposed for a limited period to "bridge a passing need." (China-Rare Earths: 2013, para 323). In contrast to the panel, the Appellate Body argued there should be a link between the measure's duration, the nature of the 'critical shortage' and the temporary nature of the measure. This means that the measure need not be of fixed duration on its face, but it must be clearly apparent that the measure will only be in place for the duration of the 'critical shortage.' This would both mark the measure out as an interim measure and also fix the period of time in a slightly different way to that envisaged by the panel. So once the 'critical shortage' ends, the measure must also be removed.

[17] Note however that the panel in the EC-Seals dispute stated that such a measure may also take effect as a TBT measure. If this is the case, the assessment of conformity of the measure with the TBT Agreement will be determined first: EC-Seals: 2013 paras 7.61-7.69. The Appellate Body found the measure was not a 'technical regulation' for the purposes of the TBT Agreement however EC-Seals: 2014, paras 5.18-5.60.
[18] Japan-Trade in Semi-Conductors, GATT BISD 35S/116, ,118.
[19] Argentina-Measures Affecting the Export of Bovine Hides and the Import of Finished Leather, Report of the Panel WT/DS155/R, (19 December 2000), para 11.8.

The Appellate Body found that a 'critical shortage' refers to "those deficiencies in quantity that are crucial, that amount to a situation of decisive importance, or that reach a vitally important or decisive stage, or turning point." (China-Raw Materials: 2012, para 324).[20] A measure will be deemed to 'relieve' a 'critical shortage' when it "[r]aises out of some trouble, difficulty or danger, bring[s] or provide[s] aid or assistance to" the situation; that is, when the measure brings some form of relief to the particular crisis experienced by the state, stops the problem escalating, or merely acts to pre-empt the 'critical shortage.' (China-Raw Materials: 2012, para 327). The Appellate Body finally suggested that whether the shortage was in fact 'critical' would depend on the 'essential' nature of the product: that is, how important the product was to the state's economy and citizens both emotionally and financially. The characteristics of the product would also inform how long the measure would need to be in place to "relieve" the "critical shortage." (China-Raw Materials: 2012, para 328).[21]

This interpretation means it is difficult for a state to bring a ban on the export of natural resources within the scope of Article XI:2(a) for several reasons. First, the only "critical shortage" of an "essential" product the Appellate Body seemed willing to sanction was a food shortage, rather a general concern that a state rich in minerals may wish to slow their extraction on sustainability grounds (China-Raw Materials: 2012, para 337). Long term preservation measures designed to limit exports to sustainable levels must instead fall within the scope of the general exceptions to the rules on goods contained in Article XX GATT, explored further below (China-Raw Materials: 2012, para 333). The Appellate Body specifically rejected China's argument that imposing export restriction over 10 years was actually designed to prevent the critical decline of mineral resources. For the Appellate Body, this was neither a temporary measure nor a response to a critical shortage, which it thought should be something much more imminent than a potential decline over ten years (China-Raw Materials: 2012, para 337). Such a finding suggests it must be possible to identify a 'tipping point' after which point natural resource depletion is so advanced as to justify an export ban. In one sense, it is ironic that the fundamental objective of sustainably managing natural resources using a multiplicity of measures is that stocks never decline to such low levels. But it should be noted that export restrictions severely disrupt the functioning of global value chains, so pushing China to consider other less disruptive measures in fact maximizes the 'value added' China (and all the participants) can earn from allowing Chinese natural resources to be used in the chain.

[20] China-Measures Related to the Exportation of Various Raw Materials, Report of the Appellate Body, WT/DS394/AB/R, 30 January 2012, (China-Raw Materials), para 324.
[21] Note that China did not try to argue its export ban on rare earths could be justified under Article XI.2(a) GATT: China-Rare Earths: 2014, para 7.200.

Import restrictions on natural resources imposed on sustainability grounds may also mean the state violates the national treatment rules in Article III:4 GATT as WTO dispute settlement panels do not permit states to impose different market access treatment on products simply on the ground of the way they were produced; this is the so-called product-process problem (PPM).[22] In the latter case, even though the imported products were processed using non-environmentally friendly methods, or violated labour rights, this product would still be deemed to be 'like' the domestic product that was not produced using that method. This severely hampers the state's flexibility in terms of its response to unsustainable production techniques by dominant corporations at the head of the supply chain, unless they can justify their measures under one of the exceptions to the GATT rules (OECD: 2011, p39). It should be noted that there is more flexibility on the PPM issue when compulsory standards are used in conformity with the TBT Agreement following the US-Tuna II, rather than an imported ban, although full discussion on the issue is yet to come before WTO dispute settlement proceedings. The Appellate Body neatly side-stepped the issue in EC-Seals, arguing that PPMs raised "important systemic issues" that were not fully argued before the panel, nor discussed in its report. As such, the Appellate Body felt it could not 'complete the analysis' left open by the panel, as to do so risked "the parties' due process rights." (EC-Seals, 2014: para 5.69).[23]

It is clear from panel and Appellate Body jurisprudence that measures that limit market access in order to preserve the health of citizens in a state during mineral extraction, or to protect against biodiversity loss or limit damage to the environment can be justified if they fall within the general exceptions to the WTO rules on trade in goods, specifically the exceptions found in Article XX(b) and Article XX(g) GATT.[24] The Appellate Body has made it clear that members can impose their own level of protection within their territory, for it is not imposing a particular policy objective that is problematic per se, but rather the measure used by the member to achieve the requisite level of protection.[25]

In China-Rare Earths, China argued before the panel that mining and extraction of Chinese rare earths caused grave harm to China's environment, and as a direct consequence harmed human,

[22] United States Restrictions on the Imports of Tuna (US-Tuna I), Report of the Panel, DS21/R, BISD 39S/155 (Sept. 3, 1991) (not adopted); United States-Standards for Reformulated and Conventional Gasoline, Report of the Appellate Body, WT/DS2/AB/R (Apr. 29, 1996); and United States-Import Prohibition of Certain Shrimp and Shrimp Products, report of the Appellate Body, WT/DS58/AB/R (Oct. 12, 1998). Note the position is different where the measure falls under the TBT Agreement: see EC-Seals: 2014, para 7.61-7.69.

[23] US-Tuna II: panel, paras 7.63-79; and Appellate Body Report, US-Tuna II, Appellate Body, paras 183-199. EC-Seals 2013, paras 7.103-7.112. On the history of the problem see OECD, Processes and Production Methods (PPMs): Conceptual Framework and Considerations on Use of PPM-Based Trade Measures, OECD Doc OCDE/GD(97) 137 (1997).

[24] Note that there are equivalent provisions for trade in services in Article XVI GATS.

[25] EC-Asbestos, para 168; US-Reformulated Gasoline para 1151.

animal, plant life and health (China-Rare Earths: 2014 para 7.149). China justified its use of export duties on rare earths on the basis of Article XX(b) GATT. It argued that the rare earth extraction process created large reservoir water pools containing toxic and radioactive substances, which if not sufficient secure, could seep into main watercourses with consequential threats to human, animal, plant life and health (China-Rare Earths: 2014 paras 7.51-7.153). Airborne toxin release was also likely. China showed that the awareness of the health risks were so well known by other states that rare earth extraction no longer took place outside China. This made China the main source of rare earths for manufacture of key components in mobile phones and microchips and, as such, put even greater pressure on its remaining natural resources (China-Rare Earths: 2014 para 7.154). The knock-on effect of China's export duties and export restrictions, however, was to severely impede inputs into the top of technology global value chains and restrict the amount of other electronic components necessary for other global value chains.

Despite China's pro-sustainability policy objective, the panel argued that China's export duties were not "necessary to protect human, animal, or plant life or health" under the exemption contained in Article XX(b) GATT. The panel noted that the WTO rules aim to strike the appropriate balance between trade liberalisation whilst allocating sufficient policy space to members so they can pursue non-trade objectives like preservation of the environment and protection of human health (China-Rare Earths: 2014 para 7.160). As the Appellate Body later noted in EC-Seals, this means that not every aspect of a measure will be considered under the general exceptions in Article XX GATT, but only those aspects that give rise to the finding of inconsistency with the GATT rules (EC-Seals: 2014, para 5.185). This means key pro-sustainability aspects of a measure may outside the scope of the WTO completely.

For the panel in China-Rare Earths, however, it was not enough for members to merely state that the measures were "necessary to protect human, animal, plant life, or health" in policy documents, they must provide "persuasive evidence of a connection between environmental protection standards and export restrictions." (China-Rare Earths: 2014 para 7.165, emphasis added). In other words, a member wishing to justify measures that restrict trade between states must explain how the measures operate so as to reduce pollution caused by their extraction or production (China-Rare Earths: 2014 para 7.166 & China-Raw Materials: 2012, para 7.508). This explanation could show how the measure indirectly contributed to the pollution reduction, but it must "consist of quantitative projections in the future, or qualitative reasoning based on a set of hypotheses that are

tested and supported by sufficient evidence." (China-Rare Earths: 2014. para 7.173).[26] Although not at issue in the EC-Seals case as the case turned on the 'public morality' exception in Article XX(a) GATT not Article XX(b), the Appellate Body stated that unlike Article XX(a), the focus on danger and risks to public, animal, plant life or health meant Article XX(b) lends itself to "scientific or other methods of enquiry, such as a risk assessment," to determine whether the measure at issue was "necessary to protect" the dangers and risks at issue (EC-Seals, Appellate Body: para 5.198). China failed to show this in the Rare-Earths dispute. Instead, there was evidence the measure favoured domestic production by allowing local producers to capture the 'value' from feeding the natural resources into the value chain (China-Rare Earths: 2014 para 7.169). The panel also noted that even though China was already using less trade restrictive measures to protect its environment, including a deposit scheme from the mines to support ecological recovery, increasing the levels of such measures was a "reasonably available alternative" to the export duties that significantly impacted on international trade in rare earths (China-Rare Earths: 2014 para 7.186; confirmed in EC-Seals: 2014, paras 5.261-5.264).

China also sought to justify its export quotas on the basis of Article XX(g) GATT: it argued the quotas related to the "conservation of an exhaustible natural resource" as they were "made effective in conjunction with restrictions on domestic production or consumption." In US-Shrimp, the Appellate Body stated that the meaning of "exhaustible natural resource" in Article XX(g) must evolve over time, taking into consideration contemporary concerns about "sustainable development." (US-Shrimp: 1998, p128). In China-Rare Earths, the parties disagreed whether rare earths were "natural resources," and, even if they were, whether they were "exhaustible."

The European Union, Japan and the United States argued "natural resources" should be limited to those resources only in their raw, rather than semi-processed, or processed form (China-Rare Earths: 2014, para 7.246). Such a view suggests primary products like grains are excluded from the definition. China did not express a view on the precise definition, but argued it should be interpreted broadly (China-Rare Earths: 2014, para 7.250). The panel neatly side-stepped the issue, stating instead that provided the measure had as its object the direct or indirect conservation of the natural resource, it did not matter that the "resource in its raw form is not the direct subject matter of the measure." (China-Rare Earths: 2014, para 7.247 & on Article XX(g) GATT, paras 7.282-7.337). Although the panel found it unnecessary to define the terms to resolve the dispute, it argued

[26] Citing the Appellate Body in Brazil-Measures Affecting Imports of Retreaded Tyres, Report of the Appellate Body, WT/DS332/AB/R, 3 December 2007, para 151. An approach confirmed by the Appellate Body in EC-Seals: 2014, para 5.211-5.215.

that only those "natural resources" that were "exhaustible" could be covered and that the term did not extend to all raw materials (China-Rare Earths: 2014, para 7.248). Interestingly, it did go on to comment that the Appellate Body in US-Shrimp had not been required to determine at what precise point processed raw materials cease to be "exhaustible natural resources" for the purposes of Article XX(g) GATT, so this issue remains open. This point was not revisited by the Appellate Body on appeal.

In China-Raw Materials the panel acknowledged that a state could impose a measure that kept the natural resource from "harm, loss, or waste," but it did not go on to elaborate whether retaining quantities of the resource for release into a global value chain at a later date was enough for the resource to be regarded as "conserved" for the purposes of exemption under Article XX(g). There seemed to be some concern among parties to the dispute that retaining natural resources in this way artificially inflated prices, and, as such, should not be regarded as a legitimate conservation measure. (China-Raw Materials: 2012, paras 7.372-7.386 & China-Rare Earths: 2014, para 7.256. The Appellate Body did not discuss this point.).

The panel in China-Rare Earths took a more expansive view, interpreting the meaning of "conservation" in the broader context of sustainable development. It argued that a moratorium on mineral extraction to slow the rate of use could be a conservation measure for the purpose of Article XX(g) in principle if it was imposed "*in accordance with a Member's development and* conservation objectives" including economic objectives to address their development needs (China-Rare Earths: 2014, paras 7.266-7.267). However, the panel did usefully point out that this interpretation did not mean a state had a license to interfere indiscriminately in the supply chain, stating instead "no WTO member has, under WTO law, the right to dictate or control the allocation or distribution of rare earth resources to achieve an economic objective. WTO Members' right to adopt conservation programmes is not a right to control international markets in which the extracted products are bought and sold." (China-Rare Earths: 2014, para 7.268).

More problematic are measures adopted by states to guarantee minimum labour standards. Within the trade community, the conventional view is that trade measures designed to protect labour rights fall outside the scope of the WTO exceptions. Some commentators argue, however, that such measures should fall within the scope of Article XX(b) as "necessary to protect human, animal or plant life or health" or Article XX(a) as "necessary to protect public morals" (Howse: 1999). In both, the state must show the measure is "necessary" in other words, that it is the "least trade restrictive" measure available and another measure would not equally meet the requirements. The

measure's necessity is determined against the state's regulatory objective therefore (China-Rare Earths: 2014, paras 7.139-7.148). It should be noted too that the narrower the scope of the regulatory objective, the less likely the WTO panel will find a "reasonably available alternative measure" that will address the concern (China-Publications and Audiovisual Products: 2009, para 251).[27]

Whilst the panel and Appellate Body jurisprudence under Article XX GATT (and Article XIV GATS) indicates an increased cognizance of the state's right to regulate and openness to find that measures designed to promote economic, social and environmental sustainability are within the list of exceptions, the same flexibility is not true for the non-discrimination test of Article XX GATT (and XIV GATS)'s chapeau which the Appellate Body regards as a "limited and conditional exception from the substantive obligations" in the GATT and GATS (US-Shrimp: 1998, para 1173). Rather, the chapeau's function is to "maintain the equilibrium between obligations under the GATT… and the exceptions provided under each subparagraph of Article XX." (EC-Seals 2014, para 5.301). For the Appellate Body in US-Reformulated Gasoline, the key to determining liability is interrogating the "manner in which that measure is applied." (US-Reformulated Gasoline: 1996, para 1166). So, the measure must not be "applied in a manner which would constitute an arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade." (EC-Seals: 2014, paras 5.301-5.303). For a measure to satisfy the chapeau it (i) must not result in discrimination; (ii) the discrimination must not be arbitrary or unjustifiable "in character" and (iii) the discrimination must not occur between countries where the same conditions prevail. (US-Shrimp: 1998, paras 1178-1179).

The Appellate Body has found "arbitrary and unjustifiable discrimination" in a number of cases, which are very instructive for this account of natural resources, global value chains and sustainable development. For example, in US-Shrimp, the Appellate Body was concerned that the US measure imposing an import ban on shrimp and shrimp products harvested by foreign ships using particular techniques violated this requirement of the chapeau because the measure had "the intended and actual coercive effect on other governments (to) adopt essentially the same policy" as the United States (US-Shrimp: 1998, para 1187). In that case, the Appellate Body felt such unilateralism was unjustified because it imposed a single homogenous standard on all states irrespective of those states' domestic situations (China-Rare Earths: 2014, para 7.353, paras 356-357).

[27] China-Measures Affecting Trading Rights and Distribution Services for Certain Publications and Audiovisual Entertainment Products, Report of the Appellate Body, WT/DS363/AB/R, 21 December 2009.

Indeed, as the panel pointed out in China-Rare Earths, the aim of Article XX is not to equalize the market conditions for all states, but rather to maintain the existing market disparities between them (China-Rare Earths: 2014, para 7.360).[28] Pro-environmental measures can be imposed, but only to the extent that they do not interfere with domestic private actors' activities any more than is necessary. The state should interfere as little as possible with private actors' competitive opportunities therefore and, as a corollary, it can be assumed that a state will fail to satisfy the requirement of the chapeau if it uses trade measures that interfere too readily in the operation of complex global value chains.

As this discussion previously showed, at first glance the WTO rules are an excellent way of controlling the extraction and use of natural resources by corporations acting through global value chains. Yet the reality is more problematic: it is uncertain whether there are ever instances where the rules will impact on the corporation directly; and the rules severely curtail the state's ability to use trade measures, like import and export quotas for example, to force large dominant corporations controlling the chain to extract and exploit natural resources in a more sustainable way. Although Article XX GATT provides limited exceptions to the rules in specific circumstances, these exceptions create further difficulties when their application is understood in the light of corporate dominance of natural resource extraction and use in global value chains.

Notably, the length and complexity of some global value chains, especially those of the supermarkets like Wal-Mart, means that a pro-sustainability tax or import restriction imposed by a state affects production at various geographic points along the chain. Inevitably, this will affect suppliers in other countries as the tasks along the chain mean production is increasingly fragmented. Whilst the Appellate Body recognised the possibility of the extraterritorial scope of some trade measures in the context of its interpretation of Article XX(a) GATT (the public morality exception) in EC-Seals, it decided not to rule on the extraterritoriality issue as the parties had not raised it in argument (EC-Seals: 2014, para 5.173). This issue still remains open.

In buyer-driven global value chains, the dominant corporation often imposes a single set of standards down the chain. As noted above, Heinz insists on one variety of tomatoes grown according to strict production methods. (Lee, Gerrefi & Beauvais: 2012, p12429). Irrespective of the Appellate Body's stated desire to protect the disparate market "conditions within the states," in reality, the corporation's insistence on one set of standards throughout the global value chain means

[28] Note the panel found that China's export quota on rare earths did not comply with Article XX(g) as it did not meet the test in Article XX(g) itself or the chapeau: ibid. para 7.679. Confirmed in EC-Seals 2014, para 5.297 & 5.312.

the market conditions in each state may be more homogenous than the Appellate Body's report indicates. The reality is that whilst the GATT appears to give states flexibility to address sustainability issues through the exceptions, in fact import restrictions become increasingly difficult to justify under Article XX due to the contemporary reality of global value chains.

Conclusion

In the 21st century production is organised through global value chains. Every stage of production is separated out and each element is undertaken in any place with the appropriate resources and skills to drive costs out of the chain and maximise profits. Production is no longer tied to one geographic location and value is added in many states using diverse corporate relationships from multiple arms-length buyer-supplier contracts to exclusive supply arrangements and joint ventures. Moving further up the 'value' chain is important for states, as processed products generate more revenue than exploitation of natural resources alone. Natural resources are critical to these chains' success because they feed into the top of the chain.

Despite the borderless character of global value chains, natural resource exploitation concerns individual states. Exploitation may generate important revenue, but problems occur: for example, mineral extraction causes severe environmental damage and monocropping results in loss of biodiversity and soil erosion. Although international instruments like the UN Global Compact (United Nations: 2000) and the Guidelines for Multinationals Enterprises (OECD: 2011) are designed to prevent 'abusive' corporate behaviour, these instruments are soft law and do not actively promote the positive benefits of global value chains whilst moderating potential environmental harm and human rights abuses. The WTO rules, with their inherent global reach, seem an excellent way to control corporate behaviour and allow states, through their trade policies, to derive benefits from their natural resources whilst still minimising the problems of extraction and exploitation.

The WTO rules do reduce barriers to trade and facilitate the movement of goods and services across borders, but they are not a panacea. WTO rules apply to states not corporations. This state-centric nature of disputes means that even when a dispute arises out of a problem within a global value chain, the WTO perceives it as a dispute within a single geographic space-that of the state in which the 'harm' occurred, with the protagonist (the other state) being equally so defined. By their nature, global value chains transcend borders however: decisions affecting suppliers may be taken in one or more states as the corporate internal structure may not 'map' on to the geographic territory of a

single state with harm felt in many states. A state-to-state paradigm is not an appropriate frame in which to understand or resolve this problem therefore (Rodrik: 2012).

Global value chains' corporate structures too are so complicated that it is difficult to attribute a 'problem' to a single standard or corporate strategy because the interaction between private and public standards from the multiple chains into which a domestic supplier feeds causes the harm. Which state is 'defendant' in such a scenario? Attempts by the state to preserve its environment or protect against climate change using trade restrictions, like quotas for example, is often viewed with suspicion by other WTO members, dispute settlement panels and the Appellate Body. As China-Rare Earths shows, the WTO rules' focus is on the legitimacy of the measure and not the policy objective per se. Yet the Appellate Body seems increasingly willing to find policy space to support the use of policy instruments that protect natural resources provided the state minimises any negative effects on trade. Broader questions about trade measures' effectiveness remain, however, given the extension of global value chains beyond geographic boundaries and the bounded territorial reach of most trade measures.

At this point, it feels customary to claim the WTO rules are not fit for purpose because they fail to fully comprehend private actors' incursion into the 'public' space and so they should be amended. But is there a governance gap into which the WTO rules must move? The WTO rules are useful to open markets to maximise the benefits derived from the increasing fragmentation of production that occurs when multinational corporations organise their production through global value chains. The statistics indicate the WTO's current and projected success here (World Investment Report: 2013, pxx1). Its rules are a blunt instrument to address the environmental harm and human rights problems surrounding natural resources exploitation and use by multinational corporations however.

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