The Dog that Didn't Bark: Explaining the Absence of a Regime Complex for Chemicals and Waste

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December 2014

First draft, please do not cite or quote – comments very welcome!!

Regime complexes are becoming a frequent phenomenon in global environmental governance. However, despite rising institutional density, no regime complex for chemicals and waste has yet emerged. This article seeks to explain why international chemicals- and waste regimes are highly fragmented, decentralized and sectoralized instead of giving rise to various types of problematic interactions and cross-institutional strategies. Addressing the Basel, Rotterdam, Stockholm and Minamata Conventions, as well as various maritime and regional agreements, I focus on functional interdependence among the subject matter to be regulated and spillovers among the substantive rules of the respective regimes. Whereas low functional interdependence allows deep cooperation through regimes of narrow regulatory scope, lack of negative spillovers disincentivizes regime shifting and makes collective interplay management unnecessary. As sectoral regimes are able to treat different types of chemicals and waste from different point sources and at different stages of their respective life cycles in an isolated manner, international chemicals governance lacks most of the characteristics usually associated with regime complexes.

1. Introduction

Regime complexes, non-hierarchic and overlapping institutions governing an issue-area (Raustiala and Victor 2004), have been identified in numerous fields of global environmental governance (Alter and Meunier 2009; Zelli and van Asselt 2013). While scholarship mainly focuses on the consequences of regime complexity (Alter and Meunier 2009; Biermann et al. 2009), its causes have increasingly been drawing attention in recent years as well (Keohane and Victor 2011; Colgan et al. 2011). The question I am pursuing in this text is why regime complexes exist in some issue areas of global environmental governance, but not in others? Why are some institutional architectures "complex", in the sense of networked regimes generating potentially problematic interactions (Orsini et al. 2013: 29), while others merely consist of "highly fragmented collections of institutions with no identifiable core and weak or nonexistent linkages between regime elements" (Keohane and Victor 2011: 8)? With regime complexes becoming more and more common, negative outcomes are of theoretical interest (Dimitrov et al. 2007), particularly when we can identify issue areas in which a plausible case can be made that, for theoretical reasons, we should expect a regime complex to exist.

This text seeks to explain the causes of a non-event: a counterfactual regime complex for chemicals and waste. The present governance architecture in chemicals and waste consists of highly-specialized, sectoral regimes with minimal overlaps and linkages among them (Krueger and Selin 2002). Considering both the degree of institutional proliferation and the international constellation of interests in the issue area, the development of multiple sectoral regimes operating in parallel and largely without problematic interactions and attempts at strategically exploiting institutional overlaps (Alter and Meunier 2009) poses a theoretical puzzle. My explanation involves, first, low functional interdependence among the subject matter to be regulated. As the different substances at different stages of their life cycles and originating from different point sources subject to international regulation are largely unconnected to each other and various chemicals- and waste-related problems can thus be addressed in isolation from each other, states can maximize their gains through deep, issue-specific cooperation where comprehensive package deals would not be feasible. Second, in those instances where multiple regimes address identical substances at the same stage of their respective life cycle, and from identical point sources, their

substantive rules tend to be redundant in terms of their respective regulatory approaches. With negative spillovers largely being absent, states lack incentives to engage in regime shifting (Helfer 2009) or interplay management (Oberthür 2009). As I show below, negative spillovers only emerge when regimes with differing regulatory approaches, in terms of either elimination and prevention, management and control, or restriction of transboundary movements, address identical substances from identical point sources and at the same stage of their respective life cycles.

Section 2 presents my theoretical framework in which I argue that the absence of regime complexes in issue areas where we could reasonably attempt to find them is a subject of theoretical interest (Dimitrov et al. 2007), before elaborating on the two explanatory variables, functional interdependence and spillovers. Section 3 addresses the subject matter, chemicals and waste, highlighting the low level of interconnections between various substances and point sources, showing under what conditions negative spillovers will emerge. Section 4 focuses on four multilateral chemicals and waste treaties as well as related regional and maritime agreements. Section 5 concludes.

2. Theoretical framework

Complexity and fragmentation

Roughly since the early 1990s, the international system has been characterized by rising institutional density and increasing fragmentation of international law, leading both to an increase in various forms of institutional interaction (Gehring and Oberthür 2009) and the emergence of different types of multi-institutional settings (Young 1996; Biermann et al. 2009). Recently, it has been proposed to understand extant multi-institutional arrangements as being situated on a continuum between two ideal types, "highly fragmented collections of institutions with no identifiable core and weak or nonexistent linkages between regime elements", and "fully integrated institutions that impose regulation through comprehensive, hierarchical rules" (Keohane and Victor 2011: 8). In the middle of this continuum, we find regime complexes, which I understand as "a network of three or more international regimes that relate to a common subject matter; exhibit overlapping membership; and generate

substantive, normative, or operative interactions recognized as potentially problematic whether or not they are managed effectively" (Orsini et al. 2013: 29). This definition departs from the original, more parsimonious one focusing on partial overlap between nonhierarchical institutions within a certain issue area (Raustiala and Victor 2004: 279). However, besides well-known problems with defining the term "issue area" (Young 2004: 5-6), the latter definition considers all types of overlaps, in combination with the other two characteristics, as constitutive of regime complexity. Accordingly, it leaves open in how far overlaps which actors consider as unproblematic are relevant for explaining their respective behavior.

Although regime complexes have been identified in a number of non-environmental issue areas, they are most frequently found in the area of global environmental governance, such as genetic resources (Raustiala and Victor 2004; Oberthür and Pozarowska 2013); forestry (Orsini 2014); climate change (Keohane and Victor 2011); biodiversity (Gomar et al. 2014); arctic environmental protection and resource extraction (Stokke 2011) or fishery (Alcock 2011). While increasingly common, though, regime complexes are not a ubiquitous phenomenon. This begs the question why we find regime complexes in some areas, but not in others? Why do some governance architectures take the form of regime complexes, whereas others merely consist of parallel regimes with minimal linkages and overlaps among them? Just as "the absence of international regimes in an issue area is an outcome of theoretical interest" (Dimitrov et al. 2007: 232), the absence of regime complexes in issue areas where theoretical reasons exist for expecting their presence poses both a theoretical puzzle and allows further insights into what drives the emergence of different types of governance architectures.

International regimes in chemicals and waste constitute such a non-event, the proverbial "dog that didn't bark". Despite a remarkable rise in institutional density since the early 1990s, this particular issue has been almost totally neglected in the literatures on regime complexity, institutional fragmentation and interaction. The lack of scholarly attention may result from international chemicals and waste governance being largely unproblematic in terms of cross-institutional consistency, and from states making very little attempts to exploit the wider institutional environment. Unlike, for instance, the regime complex for genetic resources, international chemicals and waste governance offers little in the way of forum shopping and

attempts at regime shifting, as well as controversies over the frequently unclear distribution of regulatory authority among various regimes. Thus, what is interesting about international chemicals and waste regimes is precisely the absence of a broad range of characteristics frequently associated with dense institutional environments.

Functional interdependence and spillovers

Complexity may emerge at two stages. At the stage of regime formation, when new regimes are inserted into an already dense institutional environment, overlaps may develop as a result of a regime's regulatory scope. Complexity may also result in the post-adoption stage, with actors engaging in collective interplay management, "deliberate efforts by any relevant actor, or group of actors, in whatever form or forum to address and improve institutional interaction and its effects" (Oberthür 2009: 373) or regime shifting, the latter here being understood as actors switching "from addressing problems through one regime to addressing those problems through an alternative parallel regime, possibly relocating the most relevant politics for a given issue-area from one regime to another" (Betts 2010: 14). While not attempting to define precise scope conditions for the predominance of either interplay management or regime shifting, we should the former to dominate where the various regime members share an interest in institutional complementarity (Gehring and Faude 2014), whereas the latter should prevail where a subset of actors has a clear preference for one regime over the other.

The empirical parts of this paper highlight the relevance of functional interdependence during regime formation, and the lack of negative spillovers after a regime's conclusion. Functional interdependence "occurs […] when substantive problems that two or more institutions address are linked in biogeophysical or socioeconomic terms" (Young 2002: 23). As I argue in part 3, functional interdependence in chemicals and waste is generally low. That is, specific types or point sources of chemicals and waste are usually not connected to other types or point sources in a physical sense. For instance, the generation of, say, mercury pollution is not connected to the generation of vessel-source pollution or electronic waste. Moreover, different regimes often address substances at different stages of their life cycle. This facilitates the creation of narrow and specialized regimes while reducing

the likelihood of institutional overlaps, as substantive issues can be addressed in isolation from each other.

Distinct from the physical properties of the subject matter to be regulated, I focus on spillovers between international regimes at the level of substantive rules. Positive spillovers exist when cooperation in one area facilitates cooperation in another, whereas negative spillovers are present when cooperation in one area undermines that in another. Spillovers between sets of rules are distinct from functional interdependence among the physical objects subject to international regulation. Regimes can exhibit spillovers even where functional interdependence is low, while strong functional interdependence does not necessarily imply spillovers among different sets of rules. I particularly focus on negative spillovers, and how they trigger attempts at regime shifting or interplay management (Johnson and Urpelainen 2012). Negative spillovers incentivize regime shifting behavior when actors attempt to strengthen the authority of their respectively preferred regimes over their respective priority issues and / or weaken the role of regimes they consider contrary to their interests. Negative spillovers may also lead to attempts to improve interinstitutional coherence where states have significant vested interests in multiple regimes (Gehring and Faude 2014).

As I show in Sections 3 and 4, international regimes in chemicals and waste are characterize both by low functional interdependence and few negative spillovers. The former facilitates the creation of regimes of narrow regulatory scope for deep, issue-specific cooperation, reducing the likelihood of institutional overlaps. In the post-adoption phase, the lack of negative spillovers among regimes leads to regime shifting being largely absent from the issue area, as well as little concern among states for managing problematic instances of regime interplay. However, functional interdependence and spillovers are partially endogenous, as institutional design is shaped by the properties of the particular object of governance (Mitchell 2006: 75-78). Nevertheless, Section 4 highlights several instances of negative spillovers among international regimes which are not functionally linked, with problems of incoherence and overlap resulting merely at the level of substantive rules.

While a systematic comparison is beyond the scope of this paper, high functional interdependence and / or the strongly negative spillovers both play major roles for the

emergence of regime complexity in various issue areas. For instance, the genetic resources regime complex, "almost indisputably recognised as such in the literature" (Morin and Orsini 2014: 304-305), exhibits minimal functional interdependence, yet is characterized by significant negative spillovers between international regimes for Intellectual Property Rights and agreements aiming at the fair and equitable sharing of the benefits arising out of the biotechnological utilization of genetic resources. Those negative spillovers have led to substantial efforts by developing countries to integrate provisions related to Access and Benefit-Sharing into various patent law treaties under the WTO and the World Intellectual Property Organization. Simultaneously, the absence of functional spillovers among different types of genetic resources has allowed for the partial sectoralization of international ABS regimes, such as for plant genetic resources for food and agriculture and pathogenic materials (Oberthür and Pozarowska 2013). Equally, while the climate change regime complex is characterized by comparatively few negative spillovers, functional interdependence among a broad range of climate-relevant issues, from emissions over ocean acidification up to land use, land use change and forestry, is high. Unlike for positive spillovers, moreover, negative spillovers between the United Nations Framework Convention on Climate Change and the Montreal Protocol on Substances that Deplete the Ozone Layer have led to the development of linkages and concerted efforts at collective interplay management (Johnson and Urpelainen 2012).

3. Functional interdependence, spillovers and the regulation of chemicals and waste

Functional interdependence in chemicals and waste

Chemical pollution has been identified as one of nine planetary boundaries that may cause "unacceptable global environmental change" when transgressed (Rockström et al. 2009). Presently, approximately 140.000 different chemicals are commercially available, with global industry output being valued at US$ 4.12 trillion in 2010 (UNEP 2013a:10-11). Traditionally dominated by European and North American industries, the global production of chemicals has recently been shifting towards the Asia-Pacific area, with China alone accounting for 30.5% of worldwide chemicals sales (excluding pharmaceuticals) in 2012 (CEFIC 2013: 7). Equally, between 1992

and 2008, trade in hazardous waste has increased by 500% in physical volume, from 45 to 221 million tons (Kellenberg and Levinson 2014: 139). While the largest share is transported among OECD countries (O'Neill 2000), the dumping of toxic waste poses particular challenges to countries lacking appropriate technological and administrative capacities for environmentally sound management and disposal. Differential prices for disposal resulting from different regulatory standards are a major factor determining waste flows, with producers having strong economic incentives for exporting waste to countries with lower levels of protection (Kellenberg 2012).

Both the asymmetrical distribution of industrial capacities as well as upstream-downstream problems associated with chemicals and hazardous waste contribute to high problem malignancy (Mitchell 2006). The international constellation of interests in chemicals and waste is thus comparable to other areas in global environmental governance in which regime complexes have recently emerged. The high level of fragmentation and decentralization in the global governance architecture for chemicals and waste thus cannot be explained solely by reference to state interests.

Hazardous chemicals and waste have long been recognized as a global problem for the environment and human health. The aggregate impact of toxic pollution surpasses that of Malaria in terms of Disability-Adjusted Life Years (Blacksmith Institute 2013: 5) and is acknowledged as a major driver of global biodiversity loss (SCBD 2010). A general distinction is usually made between industrial chemicals, pesticides, and industrial by-products, to which we may add chemical waste as a subcategory of "hazardous" (i.e. also including non-chemical) waste (Krueger and Selin 2002: 332-333). Chemical risks originate from a broad number of point sources, such as the transboundary movement of hazardous waste, including highly toxic electronic waste, for recycling, reuse or disposal (Robinson 2009), marine pollution from land-based sources and ocean dumping (GESAMP 2009), land-based disposal and recycling of ships (Moen 2008), agricultural pesticide use (van der Sluijs et al.: 2014), emissions from mining and coal energy (EPA 2014) or industrial activities such as lead-acid battery recycling, lead smelting, tannery and the dye industry (Blacksmith Institute 2013: 5).

Beyond the broad variety of point sources, several specific chemical substances have become the subject of particular international concern. One such category are Persistent Organic Pollutants (POPs), the hazardous impact of which has been known for many decades. POPs are bioaccumulative, building up in the fat tissue of humans and animals, degrade slowly within the environment and are capable of long-range transport through water, air and accumulation in food chains. Originally being used in numerous applications, from pesticides over solvents up to pharmaceutics, POPs have been subject to increasingly strict regulation at the international, regional and national levels due to their deleterious effects on health and the environment. Another category increasingly subject to international attention are heavy metals, particularly mercury, lead, chromium and cadmium. Causing a broad range of adverse effects, lead paint (UNEP/WHO 2012), lead fuels (UNEP/PCFV 2014) and lead and cadmium batteries (UNEP 2013b) are presently subject to international review and various multistakeholder initiatives, with mercury being the only heavy metal subject to a legally-binding multilateral treaty (see Section 4) .

While chemical pollution has strong functional linkages to a broad range of environmental problems, particularly biodiversity loss, the release of toxic substances into the environment does not influence the release of other toxic substances, or similar substances from different point sources. Thus, no functional pressure exists for states to create broad regimes for dealing effectively with a variety of interconnected problems. While states may create regimes of broader regulatory scope for numerous reasons, such as the reduction of transaction costs and the availability of package deals and issue linkages, a preference for depth over scope in issue areas characterized by low functional interdependence allows the formation of sectoral, specialized regimes that are unlikely to exhibit disruptive impact level interactions (Gehring and Oberthür 2009).

Spillovers, Regulation and Normative Conflict

Ideal-typically, we can distinguish between regulatory approaches to chemicals and waste aiming at restricting their transboundary movements, or either eliminating and preventing, or controlling and managing their generation and release. In practice, the regimes discussed in the following section frequently combine those different

objectives, with the Minamata Convention, for instance, containing provisions on trade restrictions, elimination of primary mercury mining and reductions of mercury emissions from industrial sources. The proper balance between those three objectives is frequently disputed, as regarding the question whether POPs should be eliminated or merely subject to restricted usage and environmentally sound management under the Stockholm Convention (ENB 1999: 13).

Negative spillovers arise when the same substance at the same stage of its life cycle, or the same point source, falls under two or more international regimes with incompatible regulatory approaches. As shown below, this is the case for the relationship between the Basel Convention and the MARPOL and Hong Kong Conventions, respectively. In the former case, Basel's legally unclear Article 1.4 exclusion for wastes originating from the "normal operations of a ship" has led to attempts to resolve the normative conflict between the Convention's regulatory approach of restricting transboundary movements with the MARPOL one of managing and controlling vessel source pollution by requiring member states to provide port reception facilities for sea-generated waste in order to disincentivize ocean dumping. In the case of the Basel and Hong Kong Conventions, disputed regulatory authority over ships intended for recycling has led to conflicts between the formers' restriction of waste exports and Hong Kong's approach of managing and controlling ship breaking by requiring regulatory minimum standards both for newly constructed ships and the facilities in which dismantling operations take place.

However, as low functional interdependence allows for addressing various chemicals- and waste-related problems in an isolated fashion through sectoralized regimes, the likelihood for identical substances at the same stage of their life cycle and from identical sources simultaneously falling under multiple regimes with conflicting regulatory approaches is initially low. Regimes are frequently redundant in terms of their respective objectives. Negative spillovers are thus not only initially unlikely, their inadvertent emergence is also easy to avoid. The following section shows that international chemicals and waste regimes rarely overlap in all three dimensions. Some regimes cover identical substances from different point sources while others address identical substances at different stages of their life cycle. Moreover, in those cases where identical substances from identical point sources at the same stage of their life cycle are addressed by multiple regimes, those regimes frequently pursue the

same regulatory approach, that is, aiming at either elimination and prevention, management and control, or the restriction of transboundary movements.

4. Spillovers and redundancy between chemicals and waste regimes

This section analyzes four legally-binding international agreements in chemicals and waste and spillover effects amongst themselves as well as with various regional chemicals and waste agreements. Case selection faces the problem of defining membership criteria on the basis of which a regime can be considered as relevant to chemicals and waste, as most contemporary environmental problems are, one way or the other, chemical in nature. Ozone-depleting chlorofluorocarbons, greenhouse gases, oil spills or air pollutants are all chemical substances and thus initially bear a certain relevance. Nevertheless, as issue areas are essentially socially constructed, I follow the conventional understanding of chemicals and waste regimes, focusing on the four international regimes constituting the UNEP "chemicals cluster" (Andresen et al. 2013: 425-426): the 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal ("Basel Convention"), the 1998 Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade ("Rotterdam Convention"), the 2001 Stockholm Convention on Persistent Organic Pollutions ("Stockholm Convention") and the 2013 Minamata Convention on Mercury ("Minamata Convention"). In addition, I focus exclusively on legally binding agreements, thus excluding a broad range of intergovernmental and interorganizational regulatory initiatives and discussion forums, ranging from, *inter alia*, the OECD over the International Program on Chemical Safety, the Intergovernmental Forum on Chemical Safety, the Inter-Organisation Programme for the Sound Management of Chemicals, the Strategic Approach to International Chemicals Management (Bengtsson 2010).

For each agreement, I focus on the role of spillovers both with each other and with related maritime and regional agreements, such as the Convention on Long-Range Transboundary Air Pollution's (CLRTAP) or the International Convention for the Prevention of Pollution from Ships (MARPOL). As the analysis shows, negative spillovers can only be identified between the Basel Convention and the Hong Kong

International Convention for the Safe and Environmentally Sound Recycling of Ships ("Hong Kong Convention") and MARPOL, respectively. While negative spillovers between the Basel and MARPOL regimes have triggered attempts at collective interplay management, the problematic relationship between the Basel and Hong Kong Conventions constitutes a genuine instance of regime shifting. Beyond that, spillovers are largely absent, as different regimes either address identical substances, yet from different point sources (such as POPs under the Rotterdam and Basel Conventions), or are redundant in the sense of creating similar obligations related to the management, elimination and / or transboundary movement of chemicals and waste.

The Basel Convention

The export of hazardous waste from industrialized to developing countries, where the costs for disposal are significantly lower and regulatory oversight often deficient, became recognized as a problem of international concern during the 1980s (Clapp 1994). Spurred by a number of high profile incidents of waste dumping (Wynne 1989), a joint Hungarian-Swiss proposal led to formal negotiations within the UNEP framework for developing an international convention to regulate the transboundary movement of hazardous waste. In 1989, the Basel Convention was adopted by 116 states, entering into force in 1992. Aiming to protect the environment and human health from hazardous waste, the Convention's objectives are the environmentally-sound management of such waste while limiting its production, and prohibiting transboundary movement of non-exempted hazardous waste. For exempted waste movements, it establishes a Prior Informed Consent (PIC) procedure.

Subsequent to its entry into force, numerous parties have attempted to broaden its regulatory scope. While the Convention generally only permits the export of wastes intended for final disposal from parties that do not possess the appropriate capacities to dispose of such materials in an environmentally sound manner, wastes intended for recycling or recovery are exempted from this provision (Article 4.9). This constitutes the "recycling loophole", which led to waste exports from OECD countries for purposes of disposal decreasing by roughly the same amount that exports declared for recycling purposes increased (Krueger 1999). The recycling loophole led to the Basel

Ban Amendment, adopted by the Convention's third Conference of the Parties (COP) in 1995, prohibiting *all* exports of hazardous and other wastes destined for final disposal in third countries from member states of the OECD, the EU and Liechtenstein (listed in the proposed Annex VII), while phasing out exports for purposes of recycling or recovery until 1997 (Andrews 2009). The Basel Ban is subject to ongoing legal controversies, with its opponents not considering it legally-binding unless integrated into the Convention through formal amendment.

-The Basel Convention generates negative spillovers for MARPOL, triggering attempts at interplay management. The former's Article 1.4 exclusion of wastes originating "from the normal operations of a ship" was intended to delineate the Basel regime from the International Convention for the Prevention of Pollution from Ships of 1973/1978 (Kummer 1995: 52). While the Basel Convention applies to all shipments of waste falling under its scope as long as those are subject to transboundary movement, its PIC procedure conflicts with MARPOL's Article 17.b requirement that port states provide reception facilities for waste in order to disincentivize ocean dumping. This constitutes a potential loophole when, as in the *Probo Koala* incident, generation of toxic waste is outsourced to ships in order to circumvent Basel's PIC procedure (Amnesty International / Greenpeace 2012). However, should port states refuse to grant PIC, this would trigger the Convention's Article 8 duty to re-import for the exporting state, a provision that is not applicable as ships do not constitute areas under national jurisdiction. Incoherence between Basel and MARPOL has led to sustained efforts to clarify the term "normal operations" and to demarcate the scope of, respectively, Basel and MARPOL (SBC 2011), a process that is not concluded at the time of writing.

-The problem of ship recycling is a further instance of disputed regulatory authority in the issue area. Ship recycling has been on the agenda of the International Maritime Organization (IMO) since the late 1990s. Frequently taking place on the beaches of developing countries with long coast lines, chemical hazards may result from the release of asbestos, ammonia, chlorofluorocarbons, oily residues and lead during dismantling operations (Moen 2008: 1053-1054). However, whether ship recycling falls under the Basel Convention or not has been subject to legal controversies, with some states arguing that beach-breaking does not constitute *transboundary* movement of hazardous wastes, as ships are usually intact when they are beached. From 2003

onwards, the Secretariat of the Basel Convention engaged with the International Maritime Organization (IMO) and the International Labor Organization (ILO) within a Joint Working Group, and, in 2009, IMO member states adopted the Hong Kong Convention.

The Convention regulates the materials that may be used in ship construction, the equipment and procedures to be used in recycling facilities and requires shipowners to recycle their ships in the facilities of a party. While the Basel's COP recognized the need for a sectoral regime for ship recycling, inviting the IMO to develop an appropriate instrument (Chang et al. 2010: 1391), and the Hong Kong Convention obliges parties to take into account the "relevant and applicable technical standards, recommendations and guidance" under the former (Hong Kong Convention, Annex: Regulation 3), there have been substantial controversies regarding the equivalency of the two agreements. Whereas Basel's Article 11 obliges parties to ensure at least equivalent levels of regulation in any further waste-related agreements they enter into, the Hong Kong Convention is frequently regarded as imposing lower regulatory standards (Bhattacharjee 2009). This issue came to a head at Basel COP 10 where parties were unable to achieve consensus, simultaneously encouraging ratification of the Hong Kong Convention and acknowledging the applicability of the Basel Convention (Basel Convention 2011). Should both the Hong Kong Convention and the Basel Ban Amendment enter into force, this will result in inconsistency when Basel Annex VII parties are categorically prohibited from exporting wastes to non-Annex VII parties, yet parties to the Hong Kong Convention may do so for ships which are recognized by the Basel COP to constitute hazardous wastes (Matz-Lück 2010).

-Whereas negative spillovers with MARPOL and the Hong Kong Convention constitute instances of interplay management and regime shifting, respectively, the Basel Convention's principles and objectives synergize with various regional waste agreements either regulating or banning transboundary movements of hazardous waste, such as the (expired) 1989 Lomé IV Convention's Article 39, the 1991 Bamako Convention on the Ban of the Import to Africa and the Control of Transboundary Movement and Management of Hazardous Waste Within Africa, the 1992 Panama City Agreement for South America, the 1995 Waigani Convention for

the South Pacific area, the 1996 Izmir Protocol for the Mediterranean and the 1998 Kuwait Protocol for the Persian Gulf and Oman (Marcoux and Urpelainen 2012: 407).

The Rotterdam Convention

The Food and Agriculture Organization (FAO) and UNEP had developed two non-binding instruments for governing international trade in pesticides and industrial chemicals during the 1980s, which were both amended in 1989 in order to incorporate a PIC procedure (Kummer 1999: 323-324). Negotiations on a legally-binding treaty only commenced in 1994, and the Rotterdam Convention was concluded in 1998, entering into force in 2004. Unlike the Basel Convention, it does not prohibit the transboundary movement of certain substances, but rather aims at facilitating information exchange among parties for enhancing the quality of national decision-making and PIC in regards to substances under the convention's scope. It applies to "banned or severely restricted" industrial chemicals and "severely hazardous pesticide formulations" (Article 1), excluding *inter alia* drugs and narcotics, radioactive materials, waste, chemical weapons, pharmaceuticals and chemicals in miniscule quantities that are unlikely to have a negative impact on human health and the environment. Any industrial chemicals and pesticides listed in Annex III are subject to the PIC requirement. For each of those substances, parties are required to decide whether they ban imports, restrict them or allow them unconditionally. The subsequent addition of substances is subject to fairly elaborate procedures (Articles 5-8), involving a recommendation of the Convention's Chemical Review Committee to the COP, which needs to decide by consensus in order for Annex III to be amended (Article 22.5; see McDorman 2004: 191-194). Originally listing 22 pesticides and 5 industrial chemicals, subsequent amendments to Annex III have increased that number to 33 and 14, respectively, as of late 2014.

Although a number of substances covered by Rotterdam are addressed under the Basel Convention (mercury compounds, asbestos and various POPs such as Polybrominated Biphenyls, Polychlorinated Biphenyls and Terphenyls), those originate from distinct point sources (industrial chemicals and pesticides on one hand, hazardous and other wastes on the other). Being the only dedicated, legally-binding, multilateral agreement on pesticides, the Rotterdam Convention originally exhibited

few spillovers with other regimes until the conclusion of the Stockholm and Minamata Conventions, and their coverage of pesticides containing POPs and mercury (see below).

The Stockholm Convention

In 1995, UNEP's Governing Council initiated a multi-forum initiative, encompassing the Inter-Organization Programme for the Sound Management of Chemicals, the International Programme on Chemical Safety and the Intergovernmental Forum on Chemical Safety, for an "expeditious assessment process" that could become the basis of an "appropriate international legal mechanism" on POPs (UNEP GC Decision 18/32). This assessment process was to be based on the shortlist of POPs that were then considered for inclusion in a Protocol to the CLRTAP. In 1996, the resulting multi-stakeholder working group came to the conclusion that "sufficient information was available on the chemistry, toxicology, transport pathways, origin, transport and deposition of the 12 specified POPs to demonstrate the need for immediate international action and to provide a basis for moving forward on realistic response strategies" (Buccini 2003: 17). Negotiations on a binding international instrument commenced in 1998 and the Stockholm Convention was finalized in 2001, entering into force in 2004.

The negotiation process was fraught with ambiguities over the extent to which the instrument would become either a "prevention and elimination"- or a "management and control" treaty (ENB 1999: 13). The Convention came to distinguish between three categories of POPs. Annex A lists those POPs which are intentionally-produced and subject to a ban in terms of production and use, and including 9 out of the 12 substances originally covered by the Convention. Intentionally-produced POPs subject to use-restrictions and specified "acceptable purposes" are listed in Annex B, covering only dichlorodiphenyltrichloroethane (DDT) due to its use in Malaria control (Lallas 2001: 701). Finally, Annex C covers unintentionally-produced POPs. Parties are required to take measures towards minimizing and, "where feasible", eliminating releases of those substances from anthropogenic sources (Article 5). Finally, parties are obliged to manage POPs stockpiles and wastes in an

environmentally-sound manner, with restrictions placed on disposal and transboundary movement (Article 6).

The Stockholm Convention exhibits significant overlaps with other regimes in the issue area, as multiple POPs falling under its scope are covered by other instruments, including the Basel and Rotterdam Conventions as well as various regional agreements such as the CLRTAP POPs Protocol, the Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea, the Barcelona Convention for the Protection for the Protection of the Mediterranean Sea Against Pollution and the Bamako Convention.

-The Basel Convention equally addresses polychlorinated and polybrominated biphenyls, which are subject to a complete phase-out until 2025 under the Stockholm Convention's Annex II, and trade with which is prohibited under both agreements, with the exception of export for environmentally sound disposal. Equally, a number of pesticides incorporating Aldrin, Chlordane, DDT, Dieldrin, Endosulfan, Heptachlor, Hexachlorobenzene, Mirex and Toxaphene fall under the scope of the Rotterdam Convention and its PIC requirement. However, the Basel, Rotterdam and Stockholm Conventions each focus on a different stage in the POPs life cycle (waste management, trade and production, respectively; Kummer Peiry 2014: 176).

-All of the 12 original POPs falling under the Stockholm Convention are already covered by the 1998 Aarhus Protocol on POPs to the CLRTAP, and 4 of the 10 POPs added to the Convention's Annexes A, B or C in 2009 and 2011 also fall under the 2009 amendment to the POPs Protocol (Octabromodiphenyl ether, Pentachlorobenzene, Pentabromodiphenyl ether and Perflurooctane sulfonates). The Convention and the Protocol exhibit positive spillovers, as the latter follows a complementary approach of controlling, reducing or eliminating discharges, emissions and losses of POPs (Article 2). Equally, several POPs are covered by the 1992 Helsinki Convention, by Protocols to the 1976 Barcelona Convention (the 1996 Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and Their Disposal and the 1980/1996 Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources) and by the Bamako Convention. In contrast to the Basel and Rotterdam Conventions,

those latter agreements all aim at the elimination and control of POPs instead of regulating their transboundary movement.

The Minamata Convention

While the negative effects of mercury on human health and the environment have long been known, international debates intensified in the early 2000s (UNEP 2002). Although there was a broad consensus within UNEP's Governing Council that mercury pollution required immediate international action, the decision to negotiate a legally-binding treaty was only taken in 2009 (Andresen et al. 2013). In October 2013, the Convention was signed by 91 countries and the EU, and is currently undergoing ratification. The Convention addresses primary mercury mining, trade in mercury, mercury-added products, manufacturing processes using mercury or mercury compounds, its usage in artisanal and small-scale goldmining, atmospheric emissions and releases from other sources. Parties are obliged to prohibit primary mining after the Convention's entry into force, to phase out existing mining operations over a period of 15 years, and not allow mercury exports to both parties and non-parties except for environmentally sound interim storage or other permitted uses (Article 3). Equally, except for the exceptions set out in Annex A, parties shall "not allow" the manufacture, import or export of mercury-added products (Article 4). Based on Annex B, mercury used in manufacturing processes is either to be prohibited after a specific phase-out date (Annex B Part 1), or to be restricted (Annex B Part 2) for facilities existing before the Convention's entry into force, and prohibited, without exemptions, for new facilities (Article 5). Parties are also required to "reduce, and where feasible eliminate" the use of mercury and mercury compounds in artisanal and small-scale goldmining (Article 7), to require the use of best available techniques and best environmental practices to "control" emissions from new point sources, while reporting on measures to reduce emissions from existing sources (Article 8), and "controlling and, where feasible, reducing" releases from other relevant point sources. Finally, the Convention regulates mercury storage and waste, as well as contaminated sites (Articles 10-12).

The Convention exhibits positive spillovers with other relevant agreements in terms of mercury waste, mercury-added pesticides and mercury emissions:

-The Convention requires parties to take into account the Basel Convention's guidelines on environmentally sound management, prohibits transboundary movement of mercury waste for parties to the latter agreement except for environmentally sound disposal in conformity with both agreements and, for non-parties to the Basel Convention creates obligations on environmentally sound management under Article 11. The Convention also applies to pesticides constituting "mercury-added products", which parties are obliged to phase out by 2020; for such products, the Minamata PIC requirement does not apply (Article 3.2.c). Instead, they fully fall under the scope of the Rotterdam Convention, where, however, all but six (out of 154) parties have unconditionally banned their import.

-The inclusion of mercury emissions under the Convention overlaps with the CLRTAP's 1999 Heavy Metals Protocol regulating, *inter alia*, mercury emissions subject to long-range transboundary air transport. Both regimes aim at controlling atmospheric mercury emissions from stationary point sources by, *inter alia*, mandating the use of Best Available Techniques, although the Minamata Convention establishes less ambitious obligations than the Protocol, owing to China and India being reluctant to subject their coal power plants to binding emission targets (Selin 2014: 11-12).

5. Conclusions

This text sought to explain why the governance architecture for chemicals and waste differs substantially from many other fields in global environmental governance. Despite rising institutional density, and despite an international constellation of interests in terms of the frequent North-South split, no regime complex for chemicals and waste has yet emerged. Instead, the international regimes in chemicals and waste are highly fragmented, weakly linked and characterized by an absence of interplay management or cross-institutional strategies such as regime shifting or forum shopping (Alter and Meunier 2009). As I argued, this results from low functional interdependence among the subject matter to be regulated, facilitating the formation of sectoral regimes, as well as the rare occurrence of negative spillovers among regimes, in terms of identical substances from identical point sources at the same stage of their respective life cycles being subject to different regulatory approaches.

The absence of most characteristics exhibited by extant regime complexes in the international governance of chemicals and waste may be one reason why this particular topic has so far been neglected in the literature. For scholars focusing on cross-institutional strategies, institutional interaction and interplay management, this particular case has little to offer. However, as I have argued, it is precisely the *absence* of such phenomena which makes chemicals and waste regimes an interesting case to study. Nevertheless, this particular case may be somewhat unique, as regime complexes identified in the literature so far are characterized by high functional interdependence and / or a prevalence of negative spillovers, leading to stronger integration among regimes (Johnson and Urpelainen 2012) and incentivizing cross-institutional strategies (Alter and Meunier 2009).

With research on regime complexity and institutional fragmentation increasingly moving towards explicating their causes (Colgan et al. 2011; Keohane and Victor 2011) rather than predominantly focusing on their consequences, this text has offered a preliminary conceptual framework that may be useful for explaining variations in fragmentation across different cases. This text has also highlighted how the analysis of "negative" cases can enhance our understanding of "positive" ones, in other words, how we might better understand the causes of regime complexity by seeking to explain cases in which their eventual emergence might be considered as a distinct possibility (Raustiala and Victor 2004: 306), yet with their eventual absence opening up new theoretical questions. While the necessity of comparative approaches for the study of regime complexes has recently been highlighted (Orsini 2013; Zelli and van Asselt 2013: 2), the inclusion of negative cases in the analysis provides a necessary control group for systematic inferences about the causes of complexity.

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