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Linking regime complexity to policy coherency: The case of genetic resources

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The concept of regime complexes is drawing increasing attention in the field of global politics[1]. When Raustiala and Victor introduced the notion in 2004, they rightly criticized earlier literature for presuming "that regimes are negotiated on a largely clean institutional slate[2]". Many followers of Raustiala and Victor's approach, however, have gone too far in the opposite direction, giving great weight to the power of institutions while discarding the negotiating role of States. Research on regimes that was State-centric in the 1980s became institution-centric when its research questions, initially centred on regime creation and maintenance, turned to regime evolution and interaction. Against this backdrop, this article offers a conceptualization of the role of States in regime complexes and provides an empirical illustration based on the genetic resources complex.

Regime complexes are a specific form of institutional interactions[3] defined by Raustiala and Victor as "collective of partially overlapping and non-hierarchical regimes governing a particular issue-area"[4]. Overlaps are not limited to the impact level, but are often crystallized at the normative level, either formally or informally, in conflict or synergic terms[5]. In practice, one could conceptualize complexes as networks made of regimes (the nodes) and linkages (the connections).

How exactly the elemental regimes of a complex come to overlap is often unspecified. A frequent implicit assumption is that overlaps are an unavoidable phenomena resulting from institutional density. References to the increasing number of international organizations and to treaty congestion became a writing habit in the literature. Raustiala and Victor themselves argue that "international institutions proliferate and *inevitably* bump against one another[6]". It seems that international regimes have been perceived as trees, growing naturally upward, toward the sun, to the point where several grown trees create a dense forest of international politics with overlapping foliage. This metaphor is unsatisfying. The growth of regime interplays is nothing but a natural process.

This paper argues that States are playing a central role in regime complexes' evolution. It underscores that regime complexes and governmental decision-making co-evolve as structures and agents on a morphogenetic basis. Like other structures, regime complexes are both shaped by and constraining on agents, especially States.

To explore the co-evolution of States and regime complexes, the article is divided into six parts –three analytical and three empirical. The first and the second parts sequence the evolution of regime complexes into four stages

[1] Notably two special issues have been out recently on the topic: see *Perspectives on Politics* 7(1), 2009 and *Global Governance* (forthcoming in 2012).
[2] Raustiala and Victor 2004, 280; See also Strange 1982, 491.
[3] On institutional interactions see Young 1996.
[4] Raustiala and Victor 2004.
[5] For discussion on types of overlaps see Rosendal 2001; Gerhing and Oberthür, 2004.
[6] Raustiala and Victor 2004, 306, our emphasis.

and illustrate this schematic evolution with the example of the genetic resources (GR) complex, recognized as one of the most advanced complexes in global environmental politics. The third and the four parts present a four ideal-types model of governmental coherency in external policymaking and apply it to governmental coherency in the GR regime complex for the last decade. The fifth and the sixth illustrate theoretically how regime complexes and governmental coherency coevolve and show evidences of this coevolution in the GR regime complex. Finally, the conclusion discusses the results and the policy implications of the reciprocal ties linking regime complexes and policy coherency.

Regime Complexes' Lives

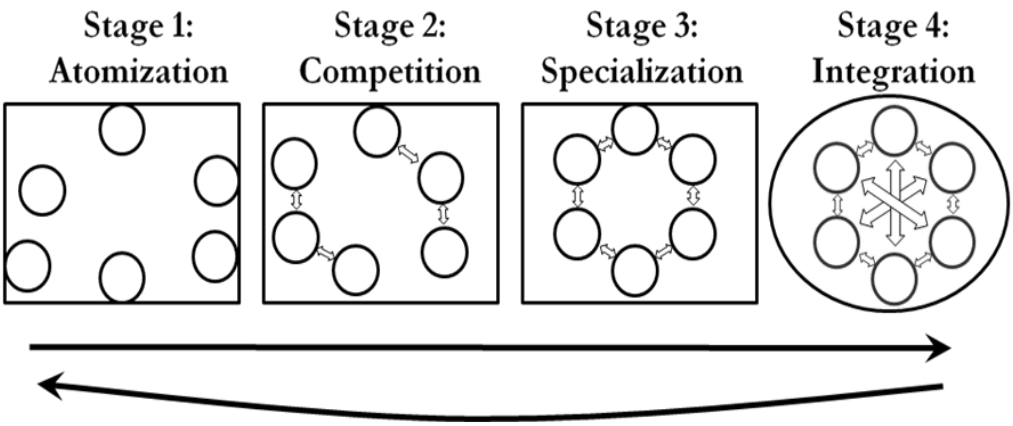
The concept of regime complexes interestingly draws attention to the overall structure of regimes rather than to its constitutive elements. Its underlying assumption is that the whole has distinctive properties from its parts, just as a galaxy behaves differently from its stars[7]. In particular, one distinctive property of complexes is to host internal tensions between the principles, norms, rules and procedures originating from their different constitutive regimes. These tensions, and their management, make regime complexes particularly dynamic.

In order to understand their evolution, density can be used as an indicator of a complex's maturity. One indicator of density could be obtained by dividing the sum of connections between elemental regimes by the number of potential connections. Based on this criterion,

Figure 1 presents the life-cycle of complexes in four stages, from the sparser to the denser.

Figure 1: The life cycle of regime complexes

[7] Raustiala and Victor 2004, 279.



At stage 1, atomization, the complex is yet to be created and regimes exist independently from one another. They can produce positive or negative externalities on each other but these impacts are neither normatively framed, nor institutionally handled.

At stage 2, competition, the boundaries between issue-areas start to blur while the first linkages between the elemental regimes appear. These linkages can be tactical, fragmented or substantive [8]. Motions of attraction and repulsion are at play. Regimes sharing normative affinities or strategic goals build institutional bridges, such as legal references, saving clauses, observatory status, or joint projects. These initial alignments are often motivated by regulatory competition. Regimes become allies in their joint effort to resist competitors and better position themselves in the creation of the complex. At stake is centrality in the complex, measured by the relative number of ties that one individual regime develops with other regimes.

At stage 3, specialisation, several meta-principles appear that organize the different views present in the complex. Competition gets progressively embedded in a broad context of shared ordering principles. When these principles are well established, elemental regimes avoid direct conflict and ensure their survival by specializing. As Gehring and Faude argue, competition among regimes is "the driving force of complex dynamics that leads to functional specialization of institutions and their selection of functional niches[9]". Elemental regimes progressively focus on functions in which they have "a comparative regulatory advantage[10]" and rely on other regimes to perform complementary functions. They increasingly recognize their complementary expertise and co-evolve over time. At one point, it becomes impossible to change a key principle in one regime of the complex without affecting all the others.

Finally, at stage 4, integration, the regime complex becomes unified. Boundaries between elemental regimes are dissolved, and inter-regime linkages become intra-regime complex linkages. The complex then starts operating independently from neighbouring regimes.

[8] Haas, 1980, 372.
[9] Gehring and Faude, 2010.
[10] Gehring and Faude, 2010.

These four stages are ideal types. They are not meant to reflect perfectly the reality of complexes' evolution. Rather, they are presented as useful heuristic devises to interpret regime complexes' lives. In practice, regime complexes evolve at an irregular pace and in a nonlinear direction. They, however, tend to get denser over time as internal tensions are managed, either by interpretation (negotiation) or implementation[11]. In order to illustrate the applicability of this categorization, the next section presents a revised narrative of the evolution of the genetic resources' complex.

The Life Cycle of the Genetic Resources' Complex

The case of genetic resources [12] is frequently used to discuss regime complexity. It is one of the few complexes that is almost indisputably recognized as such in the literature[13]. It is thus a readily accessible case to exemplify the life cycle of regime complexes. The relationship between different elemental regimes takes many forms and has diverging implications. That is why we contend that a throughout qualitative assessment of the available data on the complex is needed to understand its evolution. Such data is drawn from the literature and from former research conducted on the GR regime complex.

Until the early 1980s, the trade, the agricultural, the environmental and the intellectual property rights (IPRs) regimes that were all more or less related to GR were at stage 1 of the complex evolution. Each regime was already well established, with its own principles, norms, rules, and procedures, and evolved independently from one another[14]. For example, the Union for the Protection of New Varieties of Plants (UPOV) that was regulating IPRs for a particular set of agricultural genetic resources was established in 1961 without disturbing the 1947 General Agreement on Tariffs and Trade (GATT) that would potentially regulate the trade in GR. Likewise, the International Undertaking on Plant Genetic Resources (IU) was adopted at the Food and Agriculture Organization (FAO) in 1983 without getting much attention from environmentalists.

Though, in the mid-1980s, these regimes started to compete for the regulation of genetic resources and the complex entered its stage 2. Biotechnology appeared as a promising innovation for the exploitation of GR, as biodiversity rich as well as biotechnology rich countries claimed new rights over GR to secure their share of this revenue stream[15]. Developing countries that were

[11] Such a general evolution has already been suggested by Raustiala and Victor 2004.

[12] Genetic resources refer to genetic material of actual or potential value. Genetic resources, present in plants, animals or micro-organisms, are used as raw material for research and development in numerous industrial sectors such as pharmaceutics, cosmetics, agriculture or food. This explains why governments have invested much efforts to put regulations in this domain.

[13] Andersen 2002; Helfer 2004; Görg and Brand 2006; Pistorius 1995; Raustiala and Victor 2004; Rosendal 2001; Rosendal 2006.

[14] In his essay Pistorius (1995) describes the political arenas of food production, environmental protection and international trade as clearly independent before the 1980s.

[15] Pistorius 1995, 212; Raustiala and Victor 2004, 283.

providers of GR succeeded in including a formal recognition of their sovereignty over these resources as well as in including a principle of "fair and equitable sharing of the benefits arising out of the utilization of genetic resources" in the text of the Convention on Biological Diversity (CBD), an environmental treaty adopted in 1992[16]. In parallel, developed countries, that were developers of biotechnology applications, included an obligation to protect the IPRs linked to micro-organisms and plant varieties in the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs) of the newly born World Trade Organization[17]. The debate was by then framed in binary antagonisms, opposing bioprospection to biopiracy and modern inventions to traditional knowledge[18]. Arguments raised in both camps were based on notions of exclusive property rights, which rendered compromises unlikely. The most radical players took strong opposite stances: the United States (US) did not ratify the CBD arguing that it challenged IPRs[19] while GRAIN, one of the most vocal non-governmental organization (NGO) at the time, asked for an implementation boycott of the TRIPS' treaty that was undermining the availability of GR worldwide[20].

This opposition between sovereignty and IPRs over GR favoured strategic alignments and shaped the complex in its second stage. Regimes that were to some extend dealing with genetic resources had to pick their side. The FAO was initially reluctant to leave the issue of GR up to the United Nations Environment Programme and therefore to the CBD[21]. The CBD principle of sovereignty was even in direct opposition to the common heritage principle embodied in the IU. Though, sovereignty seemed to correspond better to the FAO mandate than strong IPRs. The FAO aligned thus itself with the CBD with the 2002 International Treaty on Plant Genetic Resources for Food and Agriculture that is explicitly "in harmony with" [22] the CBD.

Competition led to a similar strategic connection between the trade and the intellectual property regimes. Their alliance was neither natural nor easy. The World Intellectual Property Organization (WIPO) could have been institutionally threatened by the entry of the World Trade Organization (WTO) in its traditional domain. Moreover, they had initially antinomic principles, the WTO promoting free circulation of goods while the WIPO was advocating for exclusive rights. Nevertheless, the two regimes joint forces in the defence of free trade for tangible goods and protection of intangible knowledge. In 1995, the two organizations signed a cooperation agreement covering data collection, implementation, and technical assistance[23].

[16] This principle is the third objective of the CBD treaty (out of three objectives), as stated in its first article. Convention on biological diversity 1992, art. 1.
[17] Agreement on Trade-Related Aspects of Intellectual Property Rights 1994, art. 27.
[18] Bioprospecting refers to the action of collecting GR for commercial or research uses. Biopiracy refers to the misappropriation of GR. On this precise opposition see Bled 2010.
[19] Hopgood 1998, 134.
[20] GRAIN 1998. For an extended analysis of the conflict between the CBD and TRIPS see Rosendal 2001.
[21] Rosendal 2001.
[22] International Treaty on Plant Genetic Resources for Food and Agriculture 2009, art. 1.1, see also art. 1.2, art 19.3 (g).
[23] International Bureau of WIPO and WTO Secretariat 1995.

The debate matured as countries implemented all these regimes simultaneously, recognizing that they were not necessarily incompatible[24]. Several meta-norms could coexist if one clearly distinguished the genetic resources from the genetic information they contained, and from the associated knowledge developed for their use. Manichean and proprietarian discourses, based on the language of rights and exclusion, were supplanted by pragmatic discourses on effective implementation and enforcement. As identified by Raustiala and Victor "by the 1990s more than a dozen intergovernmental committees worked on the PGR [plant GR] issue, spread across all the elemental regimes -the CBD, TRIPs, FAO, and, most recently, the World Intellectual Property Organization"[25].

As the level of controversy decreased, regimes specialized and the complex entered in stage 3. The WIPO established an arbitration centre in 1994 but left State to State disputes to the WTO. The FAO specialized on *ex situ* crops and plants, leaving *in situ* resources to the CBD. Meanwhile, the Parties to the CBD recognized that IPRs were out of the scope of the CBD and commissioned a report on the WTO in 1996[26] and to the WIPO in 2002[27]. The WTO, for its part, refrained from strengthening its IPRs' obligations on biological material despite the specific negotiations scheduled for 1999 in the TRIPs agreement[28].

A functional specialization was made possible at stage 4 when all four regimes shared a common conceptual framework known as environmental liberalism[29]. In the 2000's, the core elements of the new global consensus that emerged on GR were judged "relatively clear"[30]. Today, although they disagree on the best solution to avoid a "tragedy of the commons"[31], all four regimes assume that resources, whether biological or biotechnological, face this risk. Moreover, all four recognize that clear property rights (public, private or sovereign) are necessary policy instruments for the valorisation of the "global markets"[32] of GR. Conserving, innovating, sharing, and trading are activities requiring predictability and smooth transactions.

The shift of the global debate on GR from conflict denunciation to synergies is illustrated by the recognition that each regime provides for specifics rights that are compatible since they apply to different objects and follow the same underlying principle of environmental liberalism. Complementary instruments have been developed in every regime suggesting that the complex as entered

[24] Morin 2008. Rosendal also validates this interpretation when she recognizes conflicts in the complex in 2001 but underscores synergies in 2006, Rosendal 2001 and 2006.
[25] Raustiala and Victor 2004, 293.
[26] Convention on Biological Diversity 1996.
[27] Secretariat of the World Intellectual Property Organization, 2003.
[28] Agreement on Trade-Related Aspects of Intellectual Property Rights 1994, art. 27(b).
[29] Bernstein 2001.
[30] Raustiala and victor 2004, 293.
[31] Coase 1960.
[32] Görg and Brand 2006. These authors mainly refer to the market of raw GR but the knowledge market is also central to the complex. For the growing reference to IPRS in the international GR complex see Helfer 2004.

in its fourth stage. For instance, some recent bilateral free trade agreements require the disclosure of the origin of GR in patent applications to facilitate compliance with the CDB[33]. Also, the 2010 Nagoya Protocol on Access and Benefit Sharing acknowledges "the fundamental role" of the FAO Treaty and implicitly refers to the TRIPs agreement when it calls for implementation "in a mutually supportive manner with other international agreements"[34]. Tensions remain –in particular on the mechanism and the basis on which to allocate the benefits from GR and on IPRs for living organisms[35]- but the emphasis is now on synergies rather than on conflicts.

Now that the GR complex is integrated, new questions arise regarding its relations with regimes developed on cross-cutting issue areas. For instance, the 2010 Nagoya Protocol's preamble refers to the climate change issue[36]. Also, the potential impacts of the Nagoya Protocol on the management of human genetic resources by the corresponding health regimes raise increasing concerns[37]. These are signs that the GR complex might go through its life-cycle once again, but this time to encompass new elemental regimes.

This sequencing of complexes' life cycles into four stages, illustrated by the case of genetic resources, builds on the common assumption that normative conflicts and regulatory competition "drive the institutions towards an accommodation even in the absence of a coordinating institution[38]". The evolution of regime complexes is widely pictured as a path dependant motion toward greater density and synergies. Feedback loops fuelling this motion, however, remain to be fully articulated. The next section suggests that the coherency of governmental policymaking is central to explain the evolution of regime complexes.

Policy Coherency

Understanding the feedback loops fuelling the evolution of regime complexes requires taking agents seriously. As Gehring and Oberthür argue, "an international institution will rarely influence another institution directly without intermediate adaptation of preferences or behaviour by relevant actors[39]". Though, regime complexes, which are thought to have distinctive properties, still lack a conceptual connection to agents. While most organizations undoubtedly have the capacity to act autonomously, a regime cannot in itself strategize, compete, collaborate or specialize. Rather, it is necessary to introduce agents in the analysis.

[33] Vivas-Engui and Oliva 2010.
[34] Nagoya Protocol 2010, art.4 (3).
[35] Raustiala and Victor 2004, 283. On the second point see Muzaka 2010.
[36] Nagoya Protocol 2010, preamble.
[37] Abbott 2010.
[38] Oberthür and Gehring 2006, 26.
[39] Gehring and Oberthür 2009, 129.

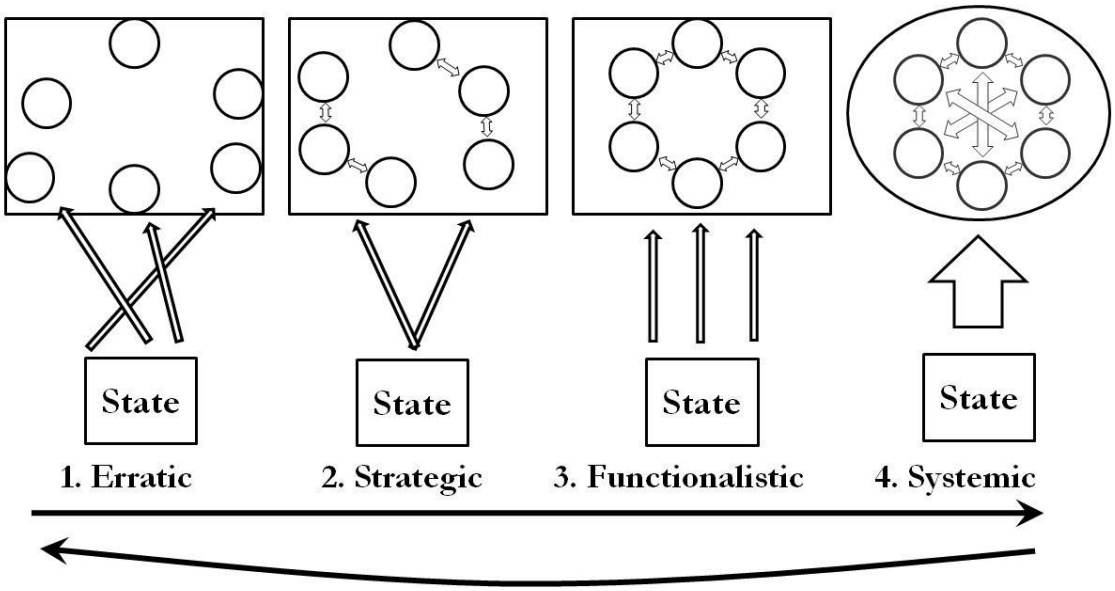
Most studies on regime complexes, when discussing the agency of State's representatives, consider that negotiators first adopt broad and ambiguous rules and then use "their implementation experiences as guides for subsequent changes in the formal rules[40]". This incremental and pragmatic approach is certainly at play. The hypothesis that cooperation induces further cooperation is at the core of regime theory and is well documented[41]. If complexes, however, are something different than their composing institutions, it is unsatisfactory to explain their development with the same mechanisms that are at play for regimes' evolution. As discussed above, complexes are notably characterized, in their first stages of development, by internal conflicts. The assumption of cautious, patient, conciliatory, and pragmatic negotiators who progressively shape a complex toward greater density is hardly tenable.

From a State perspective, the problem of complexity is expressed in terms of foreign policy coherency, a key issue in international politics, as Görg and Brand explain: "the problem of coherence shows clearly that power relations […] continue to be based at the level of the nation-state"[42]. Governmental coherency has two related dimensions: a procedural one referring to the degree of internal coordination; and a substantive one referring to the degree of complementarities between adopted policies[43]. Full coherency in a given issue-area requires both the institutional capacity for procedural coherency and the political commitment for substantive coherency. More common are situations where both dimensions are absent, or one dimension prevails over the other. Under this 2X2 typology, illustrated in

Figure 2, four ideal-types of foreign policies appear: erratic, strategic, functionalistic, and systematic[44].

Figure 2: Policy Coherence Ideal Types

[40] Raustiala and Victor 2004, 302.
[41] Keohane 1982.
[42] Gorg and Brand 2006.
[43] Di Francesco 2001.
[44] We use ideal-types because, as Kathleen Thelen (2000) suggests "social phenomena are often better captured in 'moving pictures' that situate a given outcome within a broader temporal framework.", 101.



Erratic policies are based on the assumption that international regimes and the associated negotiations are unrelated to one another. States with erratic policies have minimal internal coordination and there is no commitment to improve this situation. As bureaucratic units involved in different venues vary, positions expressed can appear inconsistent to outsiders. Two conditions increase the risk of erratic policy-making: 1) the lack of leadership, been exercised by the head of government, the department of foreign affairs, or any bureaucratic unit; and 2) the strong specialization of the various governmental units involved in policy-making, all driven by their own ideational missions[45]. Under these circumstances, bureaucratic politics prevail and externalities on neighbouring regimes are likely to be exacerbated.

Under the ideal-type of strategic policymaking, a State has the institutional capacity but not the political commitment for greater foreign policy coherency. Governmental authorities are very well aware of potential connections between elemental regimes, but deliberately try to play one against the other. When a complex is in creation, substantive incoherence can be a rational strategy to seek simultaneous gains (material or reputational) from diverse and fragmented audiences. A State could also express opposition on one proposal in one forum and support elsewhere the same proposal with the objective of operating a forum shift. Several features can make a forum more attractive than another one, including its membership, its negotiation procedures, its existing norms and principles, and its mechanisms to monitor and enforce compliance. Alternatively, a State can strategically operate a forum shift to expel one inextricable controversy to a setting where it will not obstruct negotiation.

Functionalist policymaking operates in policy chimneys or policy silos. This situation happens when States are politically committed to greater coherency but do not have strong institutional mechanisms to ensure intra-governmental coordination, as federations and coalition cabinets frequently lack.

[45] Allison and Zelikow 1999; Drezner 2000; Hopkins 1976.

Finally, systematic policymaking scores high on both substantive and procedural coherency. States having a systematic approach perceive the regime complex as a single regime and consequently institutionalize coordination mechanisms among bureaucratic units. These units then deliver a coherent message across all the elemental regimes of a complex. The next section investigates precisely how much coherent governments are in the GR regime complex.

Policy Coherency in the Genetic Resources Complex

Several studies have noted the apparent incoherency of the governmental actors involved in the GR complex. Some have suggested that States have had an erratic behaviour on this issue-area, characterized by a poor coordination between bureaucratic units[46]. Other studies have considered that States, rather than being erratic, were strategically incoherent and promoted forum shifting[47]. De Brièvе and Thomann, for example, have observed that several developed countries advocated for flexibility on GR at the TRIPs Council, a forum in which they usually advocated for high standardized norms, because they wanted to deviate the debate to a less judiciarized setting. Being erratic or strategic, these incoherent behaviours have certainly contributed to create and sustain tensions among regimes of the GR complex, at least in its initial stages. Though, most studies of this complex focus on the negotiations held in the 1990s and do neither investigate recent convergences in the complex nor the role of States in the evolution of the complex.

In order to fill this gap, we investigate the policy coherency of four governmental actors -the European Union (EU), Japan, Switzerland and the United States (US)- on the GR issue from 2001 until 2010. We limited our investigation to countries with significant industrial capacity in the biotechnological sector to control for the level of economic development and objective interests which could introduce biases in the analysis. Among developed countries, we selected the four most active governmental actors of the complex, as documented by the number of their submissions sent to intergovernmental organization, to ensure sufficient data availability. Likewise, the chosen timeframe (2001-2010) enable to control for a number of external factors that could introduce biases in the analysis. First the interests of the identified States during this period can be considered constant. Second, most institutional interactions due to competing development stages [48] are neutralized as most of the individual regimes of the complex are in the process of negotiating agreements[49]. Third, 2001 marks the emergence of WIPO as a key node of the complex with negotiations starting in the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC). Therefore, in the period studied,

[46] Petit et al. 2001, 43. See also Abbott 1997, 670; Dutfield 2001, 261; Latif 2005, 14; Raustiala and Victor 2004, 292-293.
[47] DeBrièvе and Thomann 2010; See also Helfer 2004; Rosendal 2001; Pistorius 1995.
[48] Andersen (2002) shows that regimes at different stages can impact each other.
[49] The FAO is the only exception as the International Treaty entered into force in 2004.

four fora are crucial in the GR complex: the CBD, the FAO, the WIPO and the WTO[50].

We contend that the analysis of coherency has to be firmly empirically assessed. We do so quantitatively in a first step, and then comment our results with the available official documentation on the topic.

Substantive coherency was assessed by a lexicometric analysis of the written submissions on GR sent by the four countries to the CBD, WIPO and WTO[51]. We classified the content of the corpus in 27 different semantic fields (see appendix 1). Such a categorization helps assessing to what extend one actor significantly changes its submissions according to the setting. It also tells more about the content of the submissions[52]. **Error! Reference source not found.**1 presents the results obtained before and after categorization (value in brackets). The figures obtained are based on a chi-square (Chi^2) distance. The higher the value, the greater the difference in submissions sent to the three different fora and the lower the substantive coherence. Based on this indicator, the EU and Switzerland appear more substantively coherent than the US and Japan.

Table 1. Chi^2 distance with submissions presented in other fora

	WTO	WIPO	CBD	Total	Level of substantive coherence
EU	2.20 (7,9)	2,90 (12,0)	0,49 (2,0)	5,59 (21,9)	High
Switzerland	1,50 (7,3)	1,20 (6,1)	1,80 (8,9)	4,5 (22,3)	High
US	1,50 (6,0)	2,60 (9,5)	2,40 (19,0)	6,5 (34,5)	Low
Japan	2,90 (15,0)	1,00 (5,5)	3,20 (22,0)	7,1 (42,5)	Low

Procedural coherency was assessed by examining the composition of the over-mentioned delegations to the negotiations of the GR regime complex. For data availability reasons, three negotiation processes were included: at CBD, FAO and WIPO.
Two indicators were elaborated. The first, “similarity of delegates”, measures the percentage of a country’s delegates sent to all three negotiation processes (the greater the number, the greater the similarity). The second, “similarity of

[50] More precisely, we include the negotiations hosted by the CBD Ad Hoc Open-ended Working Group on Access and Benefit Sharing (ASBWG) that elaborated the Nagoya Protocol on ABS adopted in 2010; the negotiations hosted by the IGC on a “legal instrument” for the effective protection of GR and traditional knowledge; the negotiations of the TRIPS Council that administers the TRIPS Agreement and discusses its revision; the negotiations of the provisions of the FAO Treaty that was adopted in 2004. From the first meeting of IGC in April 2001 to the end of this research project in July 2010, ABSWG met 10 times, IGC 16 times, the TRIPS Council 35 times and the committee for FAO treaty 6 times.

[51] 21 from the EU, 22 from Switzerland, 15 from the United States, and 14 from Japan. Unfortunately, FAO do not make submissions available. In total, the corpus included 192 126 occurrences of 6 730 different words. 607 keywords were then combined into 27 semantic fields, resulting in the categorization of 30 970 occurrences (16,1 % of the total).

[52] This is an important criterion to assess as coherency does not necessarily mean homogeneity of submissions from one forum to another. A State could ask for an international certificate of origin at CBD, disclosure at WTO and WIPO and open access at FAO and still be coherent.

administrations", evaluates the percentage of a country's administrations sent to all three negotiation processes (the greater the number, the greater the similarity)[53]. Appendix 2 details the mathematical formulas developed for such indicators.

Table 2 and **Table 3** bellow summarize the results obtained on procedural coherency for the four countries. It appears that Switzerland is the country more coherent of the sample, while the EU and Japan are the least coherent governmental actors. The United States occupy a middle position with an intermediary score of coherency.

Table 2. Governmental procedural coherency on the issue of genetic resources, first indicator

	Similarity of delegates (%)					
	FAO/CDB	**FAO/WIPO**	**CDB/WIPO**	**Mean for 2 fora**	**All fora**	**Level of procedural coherency**
EU	0	5	15	7	0	Low
Switzerland	4	12	3	4	54	High
US	10	2	51	11	3	Medium
Japan	7	8	44	8	0	Low

Table 3. Governmental procedural coherency on the issue of genetic resources, second indicator

	Similarity of administrations (%)					Level of procedural coherency
	FAO/CDB	**FAO/WIPO**	**CDB/WIPO**	**Mean for 2 fora**	**All fora**	
EU	0	17 (4)*	4	7(3)*	0	Low
Switzerland	33	25	59	39	24	High
US	54	38	39	44	19	High
Japan	13	24 (7)*	22	20 (14)*	8 (5)*	Medium

*: number in parenthesis exclude the permanent missions of the Foreign Affairs ministry (in Geneva for WIPO, in Rome for FAO).

By crossing results on substantive and procedural coherency, as summarized in Table 4, it appears that each governmental actor can be associated with one ideal type of policy coherency[54]. First, Japan, with its relatively low score on procedural and substantive coherency, appears erratic. It lacks both the political commitment and the institutional capacity to be coherent on the issue

[53] Bureaucratic units have been coded using information given by each participant. By bureaucratic units, we have meant different ministries, agencies, institutes, etc. but have not investigated the origin of the participants inside these units (sub-divisions of ministries, etc.).

[54] These labels have been elaborated in relative terms. It is important to keep in mind that with a larger sampling, the observed relative positions would have been different.

of GR. On substance, Japanese submissions to WTO and CBD highly differ from submissions to other fora. Moreover, the analysis of the semantic fields used by Japan does not reveal a semantic field that would be common to all negotiating fora. Also, it does not identify lexemes that Japan would specifically propose at one particular forum. In the same way, procedurally, no pattern emerges from the analysis of the Japanese delegation. The ministry of Foreign affairs and the Japan Patent office are the main bureaucratic units negotiating at WIPO, the ministry of Agriculture at FAO and the Trade ministry at CBD. Even for the same forum, the representation is irregular in terms of bureaucratic units –at CBD and WIPO more than 10 bureaucratic units are present during the period studied.

Table 4. : Synthesis on governmental coherency

		Substantive coherency	
		Low	High
Procedural coherency	Low	Japan (**erratic**)	EU (**functionalistic**)
	High	US (**strategic**)	Switzerland (**systemic**)

The US, with a relatively high procedural coherency but a low substantial coherency, appears strategic. Results show that the US sent similar delegations to all for a (19 % similar delegates). These delegations were made of representatives from foreign affairs specialized in environmental issues (State Department) as well as of intellectual property rights' experts (Patent Office). These delegates have a global picture that helps them rationalize and strategize. This confirms a study on the US representation at FAO and CBD that concludes that the "US delegations to the various international fora have relatively clear agendas[55]". Tough, the US did not translate its procedural coherency into substantive coherency. The semantic fields' analysis shows that the US overall uses significantly more the semantic fields "contract" and "science" as it defends a contract-based approach for GR users to remunerate research and innovation. Though, there is no overall coherency as the US insists on intellectual property and disclosure issues at WTO while it barely addresses these themes at WIPO and CBD. This can be explained by the fact that it does not consider that fora on genetic resources are functionally interchangeable. The US favours TRIPS[56] but has not, has said earlier, ratified the CBD. It has blocked allowing the CBD Secretariat to be an observer at TRIPs Council meetings[57].

The EU seems to have a strong political commitment for coherency but little institutional capacity. Co-participation is inexistent when we consider the three fora and law otherwise. This weak, irregular, and unbalanced joint-participation reflects a strong division of labour between DG Environment (at CBD), DG Health (at FAO) and DG Internal Market (at WIPO). Division of labour, however, does not affect substantive coherency. One possible

[55] Petit et al. 2001, 39
[56] Sell 2003.
[57] Suppan 2006.

interpretation is that the institutional identification of European bureaucrats belongs to the Commission as a whole. Specific DGs are relatively small compared to national ministries and must hold together to resist the pressure from the Council, the Parliament, and Member States. In a Europe that is still in construction, the bureaucratic politics is to be found among European institutions rather than within the Commission[58]. Interestingly, the Commission has published in 2005 a document on substantive coherency, including the issue of GR, as a "reply to the Council request to look at options in the area of policy coherence[59]". This pressure from the Council helped the Commission to be substantively coherent despite a clear and hermetic division of labour between DGs. In particular, the Commission has worked around the notion of disclosure of origin, a proposal that was submitted to the WIPO in 2004[60].
Switzerland, which scores high on procedural and substance coherency, has a systemic approach. Swiss delegations to CBD, FAO and WIPO are stable and balanced, including delegates from the Federal Office for the Environment, the State Economy Secretariat for Economic Affairs or the Federal Institute of Intellectual Property. Instead of generating distrust, the important number of bureaucratic units involved is the result of the Swiss objective to promote balanced policies taking into account environmental, trade and intellectual property dimensions, in line with the Swiss culture of compromise [61]. Moreover, our analysis of the semantic fields used by Switzerland demonstrates that this government promotes WIPO as the appropriate negotiation fora both at the WTO and CBD. Its submissions are also articulated around the notion of certificate of origin. In 2003, it has suggested to amend a major WIPO treaty, the Patent Cooperation Treaty, to include disclosure of origin[62]. Recently, the government has expressed its will to further the synergies between IPRs and environmental goals[63].

Ownership and Perceptions as drivers of cooperation

In this section we investigate the reciprocal link between regime complexes' density and policy coherency. We contend that international cooperation efforts on important issue areas increasingly follow a morphogenetic dynamic, as illustrated by the GR case. A morphogenetic dynamic means that agents (States) and structures (complexes) coevolve together[64]. More precisely we argue that policy coherency favours the integration of regime complexes, while the density of the complex favours more coherent policymaking. Coevolution does not follow a precise timing but occurs randomly at the pace of the negotiation process.

[58] Frennhoff Larsen 2007.
[59] Commission 2005, 7.
[60] European Community and its Member States 2004.
[61] Cullet, 2005
[62] International Bureau of WIPO 2005.
[63] Notification of the Swiss Federal Council quoted in Krauss and Rûssli 2010, 5.
[64] "the morphogenetic perspective is not only dualistic but sequential, dealing in endless cycles of structural conditioning/social interaction/structural elabora- tion-thus unravelling the dialectical interplay between structure and action", Archer 1985, 61 quoted in Carlsnaes 1992, 259.

It appears that the more an actor is substantively and procedurally coherent, the more it promotes density. We call this first causal mechanism linking complexes with coherency *ownershipization* –the process of sensing ownership. The more national delegates internally work for substantial and procedural coherency, the more they develop knowledge, skills and commitment on an issue, the more their negotiation mandates will ask for regime connections and complexes' density. Obviously, not all States participating in a complex simultaneously reach the same level of coherency. Strategic and functional policymaking can co-exist in a complex. However, if most participants move towards greater coherency, the complex is likely to move towards greater integration.

Another important dimension of the morphogenetic evolution is the effects of agents' *perceptions* of the structure on their behaviour. Perception of regimes' integration is very likely to increase the coherency of policy-making. The causal relation between external cohesion and policy coherency has already been demonstrated elsewhere[65]. States tend to be incoherent when their public, such as stakeholders or other States, is fragmented among numerous issue areas rather than supporting one common claim. In those circumstances, States lack the incentive to coordinate their policy and tend to seek simultaneous gains from conflicting audiences. However, once the various publics associated to a precise issue-area are coordinated and develop a common organizing idea, States tend to become more coherent, notably to avoid reputation costs associated with bold incoherence. Therefore, States rationally increase their coherency as they *perceive* increased integration in their environment.

Misperception of others' political positions can amplify this calculation in favour of greater policy coherency and put the feedback loop in motion. Robert Jervis has famously demonstrated that a common misperception in foreign policy "is to see the behaviour of others as more centralized, planned, and coordinated than it is" [66]. This inclination is, Jervis explains, a "manifestation of the drive to squeeze complex and unrelated events into a coherent pattern"[67]. The perception of an integrated institutional environment, either accurate or not, induces more policy coherency, which in turn, on our case, favours dense complexes. Other actors will react similarly, by increasing their own coherency. As the complex gets denser, the group of negotiators builds greater cohesion. This dialogue between agents and structures establishes and feeds cooperation efforts.

Moreover, a regime complex in creation has precisely the capacity "to increase the value of loyalty"[68]. As Robert Keohane argued at the beginning of regime analysis, for a government "to break the rules of a regime, the net benefits of doing so must outweigh the net costs of the effects of this action on other international regimes". [69] In a regime complex setting, inconsistency

[65] May et al. 2005. May et al. 2006
[66] Jervis 1976, 319.
[67] *Ibid*.
[68] Alter and Meunier 2009, 20.
[69] Keohane 1984, 104.

does not merely affect reputation in one regime, but in several. With time, audiences are likely to get more cohesive, expectations to converge, the complex to get denser, and the fungibility of States' reputation to increase[70].

Ownership and Perceptions in the GR Regime Complex

Going back to our results on governmental coherency, one can be surprised by results obtained for the four governmental actors. Notably, we found that Switzerland is more coherent than Japan on GR negotiation, both in terms of procedural and substantive coherency. This finding appears counterintuitive: Switzerland, a country deeply decentralized is more coherent that Japan, a country known to be centralized and socially cohesive. A key explaining factor of these results is the behaviour of delegates – more precisely their level of *ownership* - as well as the overall environment in which States are negotiating – defining *perceptions.*

We documented ownership in the GR regime complex by interviewing key negotiators of the identified countries[71]. Those interviews support our model: both the EU and Switzerland, which have the highest scores on coherency and are active promoters of an integrated complex, demonstrate the highest level of ownership on the GR issue[72].

Regarding the European Union, every European decision has to go through several internal consultations: inter-services (receiving inputs from all sides such as research, trade, internal market, etc.) and inter-Member-States. As a non-EU delegate underscored: "their own internal process is so difficult and cumbersome that you know it certainly helps to ensure coherence between the different fora"[73]. In fact, one interviewee from the Commission explained that the representatives from the different *DGs* were used to work very closely[74]. Moreover, two EU officials recognized that, in contrast to other delegates, they were committed to defend their position, for which they had developed a sense of ownership[75]. As one explains: "One thing is when you defend a position because you actually believe it is useful, it is good and another thing is when you just do it because that is the requirement you reach in an inter-service coordination"[76].

Ownership is favoured by the small size of the Commission which has "one single entry point" (an entrance exam), provides its representatives with a high degree of mobility between DGs, and privileges collegiality among

[70] Alter and Meunier 2009, 18-20.
[71] Interviews were conducted with 6 officials, 3 from Switzerland, 2 from the EU, 1 from Japan. The small number of interviewees is compensated by their quality – they all were negotiating in at least two fora.
[72] To the contrary the Japanese delegate did not mention ownership and explained how the high frequency of change in Japanese public administration impeded substantial coherency.
[73] Interview 4.
[74] Interview 2.
[75] Interviews 1 and 3.
[76] Interview 3.

commissioners[77]. On the GR issue, a change in the EU position occurred when a small group of DG officials tried to act as "bridges", forcing colleagues to discuss the concept of disclosure and using intra-services and inter-Member States consultations to promote disclosure requirements at the WTO[78]. DG officials also played a strategic card by proposing to reluctant European players a negotiation trade-off: they would be ready to consider the TRIPs Council as an appropriate forum for disclosure if developing countries supported European proposals on geographical indications at TRIPs[79]. To summarize, EU ownership was ensured by repeated official coordination meetings and by informal pressures exercised by a handful of committed DG officials.

Some similar dynamics of ownership can be found in the Swiss government. First, Switzerland has put in place in the late 1990s an inter-departmental group on IPRs that ensures collaboration between the different bureaucratic units on IPRs-related issues[80]. Moreover, the Swiss delegation has a strong individual follow-up of the GR issue: "We have only a limited number of people working on this issue at the governmental level and we have, I would say, already since 1992 and the adoption of the CBD, always tried to work together" [81]. For another Swiss delegate the follow-up really helps in progressing on the GR agenda[82].

Among the factors crystalizing ownership, not only is Switzerland a small country –which facilitates interactions between official staff- but its governmental agencies are also used to "talk to each other" and to "listen to each other". This is specific to the Swiss diplomacy, as explained by one Swiss delegate: "it is also very cultural because in Switzerland we have a culture of consensus which is very useful when we try to move towards the highest level of coherence"[83]. As a consequence, as in the EU case, two mechanisms for ownership are at play: a formal one (i.e. inter-services coordination); and an informal one (i.e. inter-personal discussions triggered by a Swiss culture of compromise). This second mechanism is said to "ensure much more coherence"[84].

But the story does not end up here as agents (States) and structures (regime complexes) also interact through a perception game. The tendency of States to increase coherency as they perceive their environment as more integrated has already been noted. Ahmed Abdel Latif, for example, a former Egyptian negotiator on GR, gave evidence of developing countries sending deliberately the same delegates to WIPO and WTO[85]. Though, no author proposed a comprehensive explanation of this process.

[77] Interview 1.
[78] Interview 3. The 1998 Directive on biotechnological inventions was already providing that patent applications should disclose the origin of biological material used in inventions.
[79] Interview 1.
[80] Interview 5.
[81] Interview 4, also Interview 2.
[82] Interview 5.
[83] Interview 4.
[84] Interview 4.
[85] Latif 2005, 27.

One way of evaluating the impact of perceptions is, again, to ask practitioners about it. As long as the complex is not perceived as such, it is hard for observers and delegates to foster attention on the issue of coherency. However, as the complex gets denser and becomes visible, it places credibility at the core of the political game. Indeed, all the interviewees who came from a country scoring high on coherency felt that they could not go back to incoherent behaviour without suffering from severe credibility loses. As one explained: "I think it is nowadays not too difficult for other parties to point out the incoherence and inconsistency of a country and then you loose credibility"[86]. Delegates from other parties were fully aware that the US and Japan do not send the same individuals to the different negotiation processes[87]. Also, while incoherence affects credibility, coherence enhances predictability and reliability[88]. This has been a major asset for Switzerland to become an important international player[89]. Again, other players are fully aware that Switzerland and the UE have a stable delegation[90].

Another way of dealing with perceptions is to centre on the role of the audience. As underlined by one negotiator, non-state actors play a major role in shaping the negotiation environment and, therefore, governmental coherency[91]. In order to analyse the composition of the audience linked to the GR regime complex, we use the lists of participants to the CBD, FAO and WIPO negotiations, just as we did with national delegates. We graphically represent two indicators describing the audience: the location of the observers present during the negotiations (
Graph 1) and their follow-up of parallel fora (

Graph 2)[92].

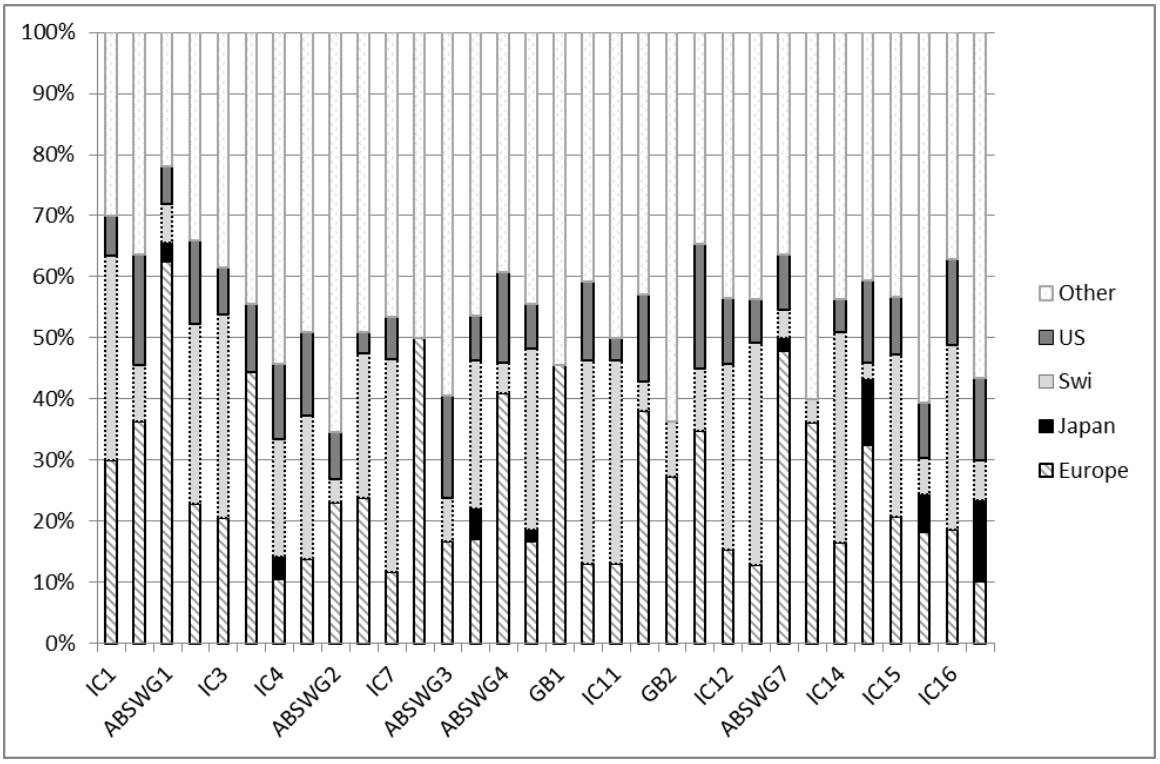
Graph 1 clearly shows that very few observers of the GR complex come from Japan (1%),or the US (9%) while a quite important fraction of them are either Swiss (13%) or Europeans (30%). We can infer from
Graph 1 that European and Swiss delegates will be put under more pressure than Japanese and American ones by their constituents. If we look at representation according to the forum, we note that European observers favour CBD and FAO while Swiss ones favour WIPO and Japanese ones the CBD. The US observers are present to all fora in a rather balanced way. The figure for Switzerland is explained by the fact that WIPO has its head office in Geneva. For Japan, it is particularly interesting to see that Japanese

[86] Interview 3.
[87] Interview 1 and 3.
[88] Interview 4, 5 and 6.
[89] Interview 4 and 5.
[90] Interview 6.
[91] Interview 6.
[92] The category "observers" is mentioned as such on the lists. It excludes international organizations and includes NGOs, business, scientific organizations and individual experts. Location was decided upon the address provided by the corresponding observers. The category "other" encompasses observers from countries not included in our study as well as observers labeled "international" when several locations were appearing on their record.

stakeholders got involved rather lately[93] just as the CBD COP 10 was announced to take place in Nagoya.

Graph 1. Location of observers (in %) according to the meeting (C= CBD, F= FAO, W= WIPO)

The first W on the abscissa corresponds to IC1 and the axis enumerates all the other meetings in chronological order



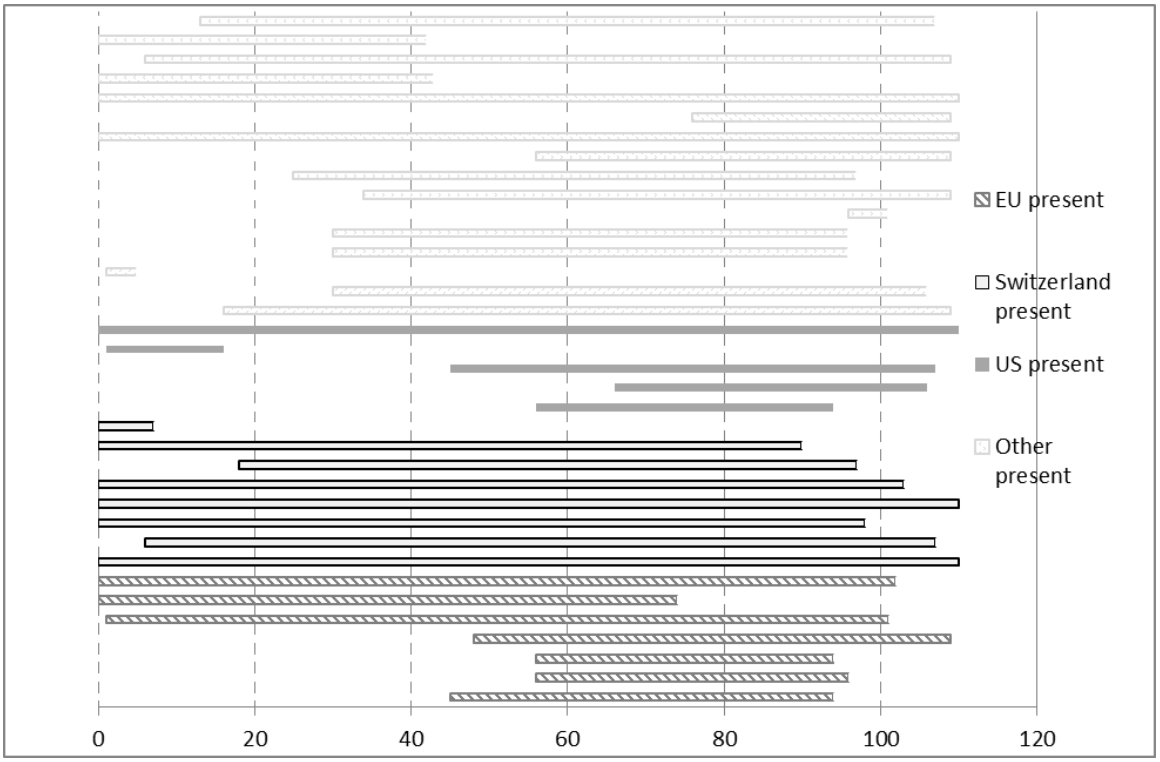
The origin of observers is an interesting indicator. Though, it does neither inform on the regularity of their attendance, nor on their follow-up of several fora. Graph 2 is meant to supplement the available information on the audience. It shows that the follow-up of the GR regime complex by observers is increasing with time[94]. Graph 2 shows that the follow-up of Swiss observers is much more regular and comprehensive than the follow-up of other observers. Japanese observers are totally absent from Graph 2 while American ones are less committed than European ones. This shows that even if Swiss observers are overall less numerous than European ones, they have a better follow-up of the GR regime complex. It is also interesting to note that the follow-up of American observers is improving with time.

Graph 2. Follow-up period of the observers participating to two or more negotiation fora on GR.

0 on the abscissa corresponds to IC1 and the axis counts the months separating all the other meetings in chronological order.

[93] This is confirmed by a Japanese delegate. Interview 6.

[94] The maximum score is of 29 observers for the IC 13 meeting in October 2008. Then, the figure decreases but this is most probably due to the fact that ours sample ends in 2010.



Audience is increasing with time, gets more specialised on the complex, and encompasses more countries. The EU and Switzerland which already score high on ownership are also regularly exposed to public pressures. This reputation burden acts as guardrail for actions aiming at further integrating the complex.

Notably, even the laggards have been forced to improve their coherency due to external pressures. When the US administration faces partners who are engaged in the integration of the complex, it can no longer ignore its increasing density. Bilateral free trade agreements with biodiversity-rich Peru and Colombia have included “understandings” reaffirming CBD’s principles of prior informed consent before accessing GR and of equitable sharing of the benefit arising from their use[95].

Japan has also been put under pressure as the negotiations of the CBD Nagoya Protocol on access to GR were taking place in Nagoya. The adoption of the protocol on GR has been largely fostered by the Japanese presidency. One Japanese delegate confirmed that the Japanese position was changing from a total refusal of payments –of all sorts- for access to accept some condition for payment “if it is written adequately”[96].

All these elements explain why the complex, as discussed in part 2, increasingly integrated. Controversies are likely to persist inside the complex, but they will tend to be resolved as ownership and reputation mechanisms increase.

[95] Vivas-Engui and Oliva 2010.
[96] Interview 6.

Concluding Remarks

This paper has argued that the density of regime complexes and the coherency of governmental policies are interlinking and co-evolving phenomena guided by internal dynamics of ownership and external processes of reputation. States negotiate the evolution of regimes and complexes structure the evolution of policymaking. Analytically, we have built two related typologies, depicting the life cycle of regime complexes and characterizing national policymaking. We have also mixed qualitative and quantitative analysis of various data sources to illustrate the morphogenetic co-evolution linking complexes and States on a predefined period of time (2001-2010).

An important finding of this study is that policy preferences and administrative coordination, at the agency level, are as unstable as regimes' interactions, at the structural level. That being said, some regimes are institutionally connected before others, and some States increase their policy coherency before others. Evolutions are jerky and uneven. Regimes with normative affinities are linked before regimes competing for centrality, despite similar membership. States with more opportunities to perceive the complex in creation become coherent earlier than those that are isolated, despite similar material interests.

This paper does not engage in normative judgments. The search for greater institutional density and policy coherency is a never ending quest. Once a complex reaches its ultimate stage, it goes back to the first stage and interacts with neighbouring regimes. Likewise, achieving coherence in one issue-area requires disturbing coherence in other issue-areas[97].

The theoretical model presented in this paper allows, however, for one prediction. If most participants move toward greater coherence, audiences get more cohesive, expectation converge, the complex gets denser, and the pressure increases on erratic and strategic States. In the GR complex, Japan and the US will not be able to afford being erratic or strategic for long. They risk, otherwise, suffering from reputation costs.

States can, however, slow down the integration process[98]. For instance, the mandatory disclosure of origin of GR in patent applications does not represent a significant burden for industry. What might appear more risky for the industry is what will come next, after the integration of the complex, when new and unexpected clashes with neighbouring regimes will arise[99]. Prolonging the last stages of integration, when debates are technical and conciliatory, might be a rational strategy to delay a return to more radical debates and institutional competition.

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Appendix

Appendix 1 : Proportional frequency of given semantic fields based on a Z value (A Z value of greater than 2.0 or less than -2.0 is considered significant)

Semantic field	US			Europe			Switzerland			Japan		
	WTO	WIPO	CBD	WTO	WIPO	CBD	WTO	WIPO	CBD	WTO	WIPO	CBD
WTO (Doha, TRIPS Council, article 27(3), etc)	0,9	-6,1	-1,1	21,0	-2,6	0,4	5,5	-4,4	-4,6	4,4	-7,3	-3,6
CBD (8(j), Cartagena, Bonn Guidelines, etc)	-7,4	-5,7	4,3	5,8	-3,2	1,2	-0,1	3,5	13,0	-2,5	-4,6	6,7
WIPO (UPOV, WIPO, IGC, Berne Convention, etc)	-8,5	17	0,1	-1,9	4,1	-12,0	11,0	7,7	4,7	-1,0	-4,1	-4,1
IP (GI, licensing, patentability, etc.)	10,0	-3,4	-3,6	4,3	5,7	-6,4	6,4	2,4	-3,9	6,6	-1,6	6,3
Science (biotech, invention, research, etc)	7,4	5,6	3,2	1,5	-2,7	-1,2	-5,3	-3,4	-2,9	10	-2,8	2,5
Environment (biology, ecologic, flora, park, etc.)	-2,5	2,6	-0,2	-2,7	-5,4	16	-7,4	-6,2	-3,5	2,5	-10,0	0,2
Development (growth, third-world, etc.)	-2,5	-2,4	0,8	1,4	-1,3	7,3	-4,3	-2,7	-0,2	3,2	-3,8	0,1
Trade (market, profit, exports, business, etc)	2,5	-0,8	0,1	-1,1	-0,4	3,8	-4,6	-2,2	-0,9	-1,1	-4,5	7,6
local (customs, tribal, native, etc)	-13,0	16	-5,5	-4,7	11,0	-7,4	-1,4	4,1	-2,6	-6,0	15,0	-5,9
Countries (nation, party, member, signatory, etc)	5,4	1,2	-0,5	-0,8	1,3	-6,3	0,9	-3,0	-1,6	-1,1	3,6	1,5
Assistance (aid, help, support, transfer, etc)	-0,9	0,3	4,8	0,7	-3,1	4,5	-2,4	-2,0	-0,5	-2,0	-5,3	1,5
Benefit sharing (ABS, access, sharing, etc)	1,2	-2,2	3,5	-1,7	-5,8	4,8	-1,7	-0,1	8,7	-4,2	-8,4	4,0
Disclosure (divulge, Transparency, etc)	10,0	-5,0	-2,5	0,9	1,7	-8,5	6,5	10,0	-2,2	-0,2	-3,5	-3,1
Informed consent (PIC, permission, etc)	0,9	-4,0	1,8	-2,9	-2,9	1,9	3,6	-1,9	-0,4	-2,5	-2,3	-1,4
Contract (MTA, contract, agreement, etc)	4,3	2,3	6,8	-1,9	-3,6	3,7	0,0	-2,8	-3,6	-1,4	-5,0	-1,7

Certainty (inevitable, necessary, must, etc)	-1,9	-2,4	-4,1	0,3	2,6	-3,0	0,4	-0,8	2,1	3,7	-0,5	-2,1
Possibility (likely, might, perhaps, ambiguity, etc)	2,9	-0,5	-0,8	-0,9	0,5	0,2	0,8	4,8	-1,7	-1,1	-2,0	-4,5
Law (decree, illegal, judge, penal, etc)	-3,4	-2,6	3,1	3,4	-5,2	1,9	0,7	-2,3	2,2	0,9	-3,5	0,1
Negation (cannot, no, never, none, nothing, etc)	4,5	-1,4	-1,5	2,8	-1,1	-1,6	-3,4	-2,7	-3,9	0,1	7,9	-2,0
Moral justice (fair, wrong, legitimate, etc)	-0,4	-0,4	-0,9	0,5	-0,9	-3,6	9,2	-1,7	0,0	1,1	1,2	2,5
Dramatic (Suffer, urgent, victim, vital, etc)	-0,7	-0,4	-1,9	1,1	-1,7	4,1	-3,1	-0,7	-0,3	0,8	-2,1	1,4
Battle (combat, conflict, dispute, struggling, etc)	4,2	-0,1	-1,7	-1,0	1,3	-1,9	-0,5	-1,3	-2,1	-0,4	1,9	-0,4
Collaboration (agree, consensus, etc)	-0,6	-1,2	5,1	0,0	-0,9	1,0	-1,6	-2,2	-0,4	-2,1	-1,7	3,5
Agriculture (crop, farm, food, seed, etc)	-7,2	-6,4	0,2	8,0	-4,4	14,0	-1,4	-4,2	-1,7	0,0	-8,2	-2,9
Arts (artist, author, creative, etc.)	-0,9	12, 0	3,1	-2,4	6,8	-5,5	-2,7	2,2	-2,4	-1,9	3,8	-1,7
Pharmaceuticals (drugs, health, virus, etc.)	2,8	-3,3	3,7	-3,0	-3,0	8,3	-3,2	-3,6	-2,5	1,9	-5,0	0,6

Appendix 2: Indicators of national procedural coherency

similarity of delegates	similarity of delegates	similarity of delegates
FAO/CDB	FAO/WIPO	CDB/WIPO
$\frac{1}{S_{FAO}+S_{CDB}}\sum_{i=1}^{j}(n_{FAOi}+n_{CDBi})$	$\frac{1}{S_{WIPO}+S_{FAO}}\sum_{i=1}^{k}(n_{WIPOi}+n_{FAOi})$	$\frac{1}{S_{WIPO}+S_{CDB}}\sum_{i=1}^{l}(n_{WIPOi}+n_{CDBi})$

similarity of delegates
All fora
$\frac{1}{S_{FAO}+S_{CDB}+S_{WIPO}}\sum_{i=1}^{m}(n_{FAOi}+n_{CDBi}+n_{WIPOi})$

S_{WIPO} = Number of delegates sent to WIPO meetings

S_{FAO} = Number of delegates sent to FAO meetings

S_{CDB} = Number of delegates sent to CBD meetings

n_{WIPOi} = Number of WIPO meetings followed by delegate *i*

n_{FAOi} = Number of WIPO meetings followed by delegate *I*

n_{CDBi} = Number of CBD meetings followed by delegate *i*

j = Number of delegates having followed at least one FAO and one CBD meeting

k = Number of delegates having followed at least one FAO and one WIPO meeting

l = Number of delegates having followed at least one CDB and one WIPO meeting

m = Number of delegates having followed at least one CDB and one WIPO meeting

similarity of	similarity of	similarity of

administrations	administrations	administrations
FAO/CDB	FAO/WIPO	CDB/WIPO
$\sum_{i=1}^{a} \min(\frac{m_{FAOi}}{S_{FAO}}; \frac{m_{CDBi}}{S_{CDB}})$	$\sum_{i=1}^{a} \min(\frac{m_{WIPOi}}{S_{WIPO}}; \frac{m_{FAOi}}{S_{FAO}})$	$\sum_{i=1}^{a} \min(\frac{m_{WIPOi}}{S_{WIPO}}; \frac{m_{CDBi}}{S_{CDB}})$

similarity of delegates
All fora
$\sum_{i=1}^{a} \min(\frac{m_{WIPOi}}{S_{WIPO}}; \frac{m_{FAOi}}{S_{FAO}}; \frac{m_{CDBi}}{S_{CDB}})$

a = Number of different administrations

m_{FAOi} = Number of delegates from administration *i* sent to FAO meetings

m_{CDBi} = Number of delegates from administration *i* sent to CDB meetings

m_{WIPOi} = Number of delegates from administration *i* sent to WIPO meetings