

Earth System Governance and the Complexity of Collective Decision-Making

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Abstract

As with any international cooperation endeavor that aims at steering multiple actors toward achieving a given goal, reaching a consensus on how to prevent and mitigate adverse global environmental changes can be complicated. Opposing views have emerged over what is right, fair and equitable. In addition, the procedures and criteria that will be used to aggregate the respective views on what is fair and acceptable in earth system governance are issues that cannot be ignored. Based on the obvious differences in the distribution of vulnerabilities to adverse changes in the global environment, the challenge of earth system governance can be defined as a decision problem among stakeholders with diverse payoffs and preferences. Generally, one of the main aims of this paper is to analyze this complexity. To achieve this goal, we have reviewed the experiences of comparable multilateral negotiations, with the aim of drawing some lessons and defining implications for earth system governance. In analyzing the complex interaction among diverse stakeholders, we observed that this analysis is further complicated by the uncertainty regarding expected utilities in the scheme of earth system governance. Using relevant postulates on collective action and decision-making, we have identified some issues that underlie the achievement of cooperation and unconditional commitment. We conclude with a set of recommendations that are applicable to some of the unique features that characterize earth system governance.

Key words: *Complexity, Collective Decision-Making, Earth System Governance, Heterogeneity.*

1. Introduction

The concept of earth system governance (ESG) is complex. It has been identified as a challenge to the social sciences. To a large extent, the complexity is based on the interwoven and multi-dimensional nature of the analytical problems and questions that earth system governance seeks to address. In addition, the networks of local and global actors with heterogeneous and idiosyn-

cratic preferences do not make things easier. As a matter of fact, heterogeneity has complicated the definitions of justice and fairness in the context of abatement cost and burden allocation. Equally, earth system governance is designed to integrate “the interface of two broad strands of academic inquiry: governance theory and earth system analysis” (Biermann et al., 2010: 279). While governance entails forms of regulation, decision making and intergovernmental bureaucracies, earth system analysis entails the use of natural science models to understand the various elements of nature and climate change.

Given the enormity of thematic issues that ESG encompasses, the main focus of this paper will be on the systems of rules and rule-making that are set up in respect of global environmental changes and challenges at the level of international agreements and cooperation. As an example, since the achievement of climate policy’s ultimate objective requires cooperation and coordination, ESG will become a top issue in multilateral environmental negotiations. We explore these from a collective-decision making perspective. Our interest in this scope is based on the challenges: especially the deadlocks that have characterized the collective decision-making processes, and the paradox of rationality that such deadlocks imply. This is also in line with some of the cross-cutting questions that are raised in the ESG research framework. In particular, it will touch on issues like learning and knowledge, the factors that shape national and global preferences and behavior, and the role of polycentric and multi-layered systems of rules and governance. The use and the applicability of these notions used in this paper will become clearer in due course.

As noted by Olson (1965) “men journey together with a view to a particular advantage and by way of providing some particular thing needed for life; and similarly, the political association seems to have come together... for the sake of the general advantage it brings” Olson (1965: 6). From such a perspective, ESG can be seen as a process that seeks to provide a global advantage, in terms of climate change mitigation (a problem that has global implications). Equally, addressing the challenges will require some levels of cooperation and organization; collective action. At the level of international cooperation, an assumption that must underlie the process is the presupposition that it is in the interest of all states, as members of the international community, to address climate change problems. In such a case, ESG can be viewed as a part of the organizational effort that is designed to fulfill this interest. Since it will be difficult to exclude a state from enjoying the benefits of improvement in the earth system however, strategic incentive prob-

lems are bound to arise. Such incentives problems have been at the heart of various perspectives on the dynamics of actions and preferences in a collective action context.

In essence, countries, as members of the international community are assumed to have interests and preferences. This view was central in the *Institutional Dimensions of Global Environmental Change Project*. Thus, countries are expected to act on the basis of domestic payoffs and utilitarian maximization. Based on this perspective, “the prisoner’s dilemma, the free-rider problem, and, more generally, problems of burden sharing and compliance” (Young, 2007: 5) have become parts of the critical concerns in ESG. The similarities between the ESG project and a collective action problem (where supposedly rational actors achieve global outcomes that are irrational or sub-optimal) has enhanced the understanding that addressing global environmental problems can often result in the deadlocks, free-riding and non-compliance. In line with this view, the creation of institutional arrangements that aim at solving or alleviating global environmental problems has been seen as an exercise that entails overcoming a collective-action problem.

Remarkably, even if it is in the interest of all states, as members of the international community, to address climate change problems, the commonality of such an interest may not necessarily preclude the possession of unique individual interests and preferences. As a matter of fact, states have sometimes exhibited antagonistic preferences in terms of what is fair and generally acceptable at international climate change conferences. Differential views have characterized the nature of international climate change negotiations and proposals. Some states (or group of states) would prefer that others bear the entire cost of climate change mitigation, while some would require some level of commitment from other states as a prerequisite for agreement and cooperation. In addition, some states would not mind being at the fore front of voluntary commitments, while some would prefer adopting a “wait and see” approach.

Similarly, the failure to reach a collective binding agreement may not necessarily mean that “the collective benefit that could have been achieved was unimportant to the participants” (Ostrom, 2011: 26). Non-agreements can indicate how the pursuit of unique self-interests leads to disagreements and less undesirable outcomes. In turn, such inadequate outcomes have given rise to deep skepticisms towards multilateral negotiations on climate change policy. As a result, we describe the behavior of states in ESG as both purposive and contingent. Complexity in the decision making process arises, partly, as a result of the fact that states may place different im-

portance on the benefits of climate change mitigation. By purposive: state choices or preferences may depend on how a country “learns about, views and weighs the benefits of costs of actions and their perceived linkage to outcomes that also involve a mixture of benefits and costs” (Ostrom, 2011: 33). Contingency on the other hand refers to views on the minimal level of cooperation or participation that a state requires for switching preferences (particularly from non-cooperation to cooperation, or vice-versa). It can also be referred to as the situational variables that shape state choices and preferences in an international collective-decision making context.

One of the main arguments in this paper is that an understanding of the development and dynamics of state in preferences and dispositions over an issue like earth system governance is a prerequisite for progress in the context of multilateral decision making. We hope to come up with some reasoned lessons and recommendations on how to advance cooperation and the achievement of ESG project’s objectives. This paper is organized into six sections. We have reviewed related studies on the element of complexity of decision-making at the level of international cooperation in section two. The third section focuses on some applicable insights from collective decision-making theories. In the fourth section we examine the complexity from a threshold perspective. The implications of these theoretical perspectives on ESG are discussed in section five. Section six gives the conclusions.

2. Related Studies¹

Since the inception of the *Framework Convention on Climate Change*, a good number of studies have looked at the challenges that impinge on progress in international negotiation and on the rate of general responses to earth system management. As an example, while arguing for an increase in the efforts to introduce a collective decision making process in the Framework convention, Parikh et al. (1997) review the issues and risk factors that need to be assessed for the decision-making process from a developing country’s perspective. Factors that will affect the collective decision-making process, as identified in Parikh et al. (1997) include: conflicting criteria for allocating emission abatement costs and burdens, the distribution of per capita emission between countries and regions, historical records of past emission, and the uncertainty that surrounds

¹This section reviews some of the problems related collective decision-making with regard to earth system governance and the mitigation of climate change challenges. Given the growing number of studies on various cross-cutting issues that are applicable to multi-agent decision-making, we have restricted the focus of this review to those studies that concentrate on decision making process in the context of climate change and earth system governance.

some of the hypotheses on the nature of climate changes. Similarly, Read (2004) examines the dimensions of climate change issues and the role that multi-dimensional issues play in the decision-making process. In Read's words: "aspects significant for the decision-making process are vestigial uncertainty on the science; great uncertainty on impacts and substantial uncertainty on technological prospects; sharply different geographic temporal distribution or responsibility and vulnerability; ignorance of the threshold for danger; and long time-scale with potential for sequential decision taking" (Read, 2004: 2). Thus, the question in the decision-making process is said to hinge on how to form a consensus among states on the methodologies that will be effective in achieving mitigation and adaptation.

In the views of Burgenmeier et al. (2006), the applicability of cost-benefit analysis has become a central issue in the political decision-making processes. As a decision support tool, the use of cost-benefit analysis (CBA) frameworks in determining optimal climate policy responses is sometimes constrained by informational problems and fundamental uncertainties. "To implement the CBA approach, it is thus necessary to know and quantify all previous parameters, i.e. costs, benefits and the discount rate, as well as their evolution through time. Of course, in the context of global warming, this is an incredibly complex task and it has to overcome an extraordinary information problem" (Burgenmeier et al., 2006: 145). In view of these constraints, they argue for the use of integrated assessment models (that can take into account the non-linearity and uncertainty that characterize most of the parameters) that are relevant for an economic analysis of climate change policy benefits.

With particular reference to the reasons behind the failure of international climate negotiations, Vihma and Asselt (2012) observe that the complexities that typify the structure of the problem have been a challenge to international decision making. First, both developed and developing countries are known to prefer international climate policies that are designed to suit their respective domestic circumstances. As a result, it is possible for a country to feel uncomfortable with any international agreement that imposes certain levels of burden in mitigation of climate change. Given the level of differences in domestic positions and circumstances, the possibility of reaching an agreement has gained the status of a utopian expectation. In addition to these differences, the norm of state sovereignty, and the political constraints that it implies with regard to the implementation and ratification of international agreements have become an equally dominant factor.

Furthermore, Wangler et al. (2012) survey the impact of domestic political processes on a country's willingness to ratify or comply with an international agreement on climate change. The survey points out that state positions and proposals are shaped by different layers of domestic political negotiations. Behind the scene of multilateral negotiations are different domestic pressure groups, competition between various ministries, NGOs as well as domestic industries or private sectors. Since the mixtures of incentives that are embodied in these special interests and groups sometimes determine the position of a government at the negotiation table, it is argued that the formation of a stable international agreement is undermined by the respective countries domestic politics.

In spite of the role that these factors (such as uncertainty, differential circumstances and domestic politics) have played in some of the deadlocks and disappointments that are associated with multilateral environmental negotiations, Vihma and Asselt (2012) argue that, when countries do not reach an agreement to cooperate, the outcome of such disagreements may not be gloomy at the end of the day. Thus, the ability to keep climate change mitigation on the top of international political agenda has been referred to as one of the major achievements of frameworks on climate change. The momentum and the diffusion of ideas that such frameworks create are expected to ensure "that all countries move forward — albeit slowly and incrementally— towards the common goal of avoiding dangerous climate change" (Vihma and Asselt, 2012: 6).

Some fundamental insights have also been gained from game theoretic perspectives. In this regard, the interplay of diverse incentives, proposals and preferences is referred to as a global dilemma. One of the key lessons from the game theoretic approach could refer to how the uncertainty regarding the participation of major emitters affects the choice of other countries. Another lesson entails the recognition of how the presence of ancillary local benefits can affect a decision maker's incentive to cooperate at the international level (Pittel & Rubbelk, 2012). From a cooperative game perspective, McGinty et al. (2012) examine the role of externality, equity and fairness on the stability of agreements among asymmetric players, using experimental laboratory tests. As McGinty et al. (2012) observe; the appropriateness of sharing rules (such as Shapley value and Nash bargaining solutions) is constrained by the "public good" nature of global environment. Thus, the fact that it will be difficult to share the intangible benefits of cooperation (in terms of improvements in the climate) among states that decide to cooperate, based on equity and fairness criteria is recognized as a main source of incentive problem. Also, the fact that non-

members of the coalition can enjoy the benefits the positive externalities of improvements is recognized as one of the main motivations for free-riding, and non-compliance, irrespective of the sharing rule's optimality.

Regarding the use of game theoretic models in analyzing international negotiations on climate change however, many criticisms have emerged. First, Wangler et al. (2012) argue that this approach suffers from over-simplifications. The unlikelihood of simplified structure to match realities is identified as a major limitation. As an example, most of the models wrongfully assume that an agreement is synonymous with ratification and actual compliance or implementation. In addition, apart from the use of identical payoff functions, the approach usually ignores the impact of re-negotiation options (particularly when the expected pay-off of a country changes as more information becomes available) on the strategic options available to a player.

In summary, the main focus of previous studies has been on identifying the various issues that militate against multilateral decision-making in the scheme of global environmental governance. A major link between these studies is that there are several factors that impinge on state preferences and positions. Beyond recognizing these attendant constraints and challenges (such as ignorance and fundamental uncertainties on certain parameters, the impact of state sovereignty, and existence of multi-level heterogeneous preferences), the aims in our paper and the approached adopted for achieving those aims are significant in a number of ways. Since most of these issues happen to be at the cross-road of theories on collective decision-making, some of the unique questions that our paper seeks to address include: how relevant are the theories on collective decision-making in the context of ESG? Is it possible to use such theories to advance the achievement of the objectives of the ESG project? In answering these questions, we hope to enhance the understanding on some of the dynamics that characterize the process of state preference formation.

3. Insights from Collective Decision-Making Theories

The deadlocks that characterize multilateral negotiations on climate change present a practical opportunity for re-examining the usefulness of various theories on collective decision-making. In a situation where each country faces a simple binary decision problem that involves two mutually exclusive choices - to accept or reject an international agreement on ESG; it is possible for each country to form a preference relation over these two choices, based on their respective utili-

ty functions. The existence of utility functions has been one of the underlying foundations in the study of individual preferences and decision making. Thus, it is “assumed that preferences, to a greater or lesser extent, govern the decision and that, generally speaking, a decision maker would rather implement a more preferred alternative than one that is less preferred” (Fishburn, 1970: 1). In agreement with the notions developed in this regard, the choice of each country will be directed towards achieving a given goal. Notably, we envision the fact that a goal can also be multidimensional. A goal could refer to the outcome to which the state directs its choice or preference. In addition, the assumptions of rationality and purposefulness imply that a country will choose as though they make some calculations. Furthermore, it is assumed that the ‘state of nature’ provides the conditions upon which a country selects a given choice in view of a certain outcome. Consequently, choices are ranked based on judgments regarding the likelihood and desirability of the corresponding implications and consequences. In this regard, a country is expected to prefer choices that it expects to yield better outcomes. Preference for outcomes will in turn influence the country’s preferences over alternative strategies.

An individual country’s respective preference is important in the study of an international decision making situation. As an example, if the finite set of strategies or course of action S is the set $\{x: \text{accept or make a commitment to limit emission, and } y: \text{reject a commitment to limit emission}\}$, where each country makes one and only one decision at a time, it is possible for each decision maker to assign utilities u to each of the alternatives x and y in S . In choosing between x and y at the country level, there are three main possibilities regarding relation between $u(x)$ and $u(y)$. Namely, it is either $u(x) > u(y)$, or $u(x) < u(y)$, or $u(x) = u(y)$. The third possibility can be taken as the absence of a strict preference relation between the two options in S . At the international level, the collective choice will be “determined from multiple sets of criteria or rankings about what is best or preferred” (Heiner, 1981: 297) in each country. If $N = \{1, \dots, n\}$ represents a set of countries in a multilateral decision making context, where p_i denotes country i ’s orderings of the choices in S , the full set of orderings will be $[p_1, \dots, p_n]$. Under normal circumstances, obtaining a collective choice would not be perplexing if the preferences of all countries are identical or devoid of conflicts.

However, as each alternative choice in S may have differential consequences or outcomes in different countries, each country i will develop its respective preferences p_i in terms of its judgment over an outcome’s desirability. Thus, it is assumed that countries will rank their re-

spective choices, using any standard or set of values that they considers suitable to their own peculiarities. In reality, the standards or values could be environmental, economic, geographic, demographic, historical responsibility, energy security, or purely political. As a result of this possibility, we are faced with the case where preferences differ from one country to another; such that xp_iy and yp_jx , for some country $i, j \in N$. Under these conditions of variable circumstance, the crux of the problem will lie in the fact that there may be differences in individual country utilities and preferences. Even in the cases where there are some elements of uncertainty regarding the consequences or benefits of a give strategy, it may still be possible for each country to decide on a particular course of action based on some probabilities.

Thus, the main objective will be to devise a mechanism or process that is suited for arriving at a collective choice that is unanimously desirable and acceptable. Normally, “a natural way of arriving at the collective preference would be to say that one alternative is preferred to another if a majority ...prefers the first alternative to the second, i.e., would choose the first over the second if those were the only two alternatives” (Arrow, 1963: 3). Nevertheless, when certain conditions are required, the suitability of majority voting can be undermined. As an example, based on the notion of inter-country utility comparison, some controversies may arise when different postulates on justice, equity and compensation are imposed. By insisting on satisfying such conditions, one of the aims in ESG could be referred to as the achievement of climate policy’s ultimate objective, subject to some certain fairness and equity constraints. In this regard, Olson notes that there is no “inconceivable cost-sharing arrangement in which some member does not have a marginal cost greater than his share of the marginal benefit, except the one in which members of the group share marginal costs in exactly the same proportion in which in which he shares incremental benefits” (Olson, 1965: 31).

Furthermore, two of Arrow’s conditions that are outstandingly applicable in this regard include: the condition of sovereignty, and the condition of non-dictatorship. In defining the former requirement, a country’s freedom to choose or decide is emphasized. That is, the collective decision should not lead to a situation that prevents some countries from expressing their respective preferences; otherwise, the decision will be said to have been imposed. On the other hand, the condition of non-dictatorship implies that the collective choice is not to be based solely on the preference of one country alone. In this regard, it does not have to be the case that whenever a given country prefers a certain position, so does the rest of the international community, re-

ardless of the strict preferences of all other countries. In the absence of a unanimous preference, satisfying these two conditions in the context of ESG will not be easy. Both are satisfied when there is a preference are identical or mutually compatible, such that for all participating countries, one option (say *commitment*) is preferred to the other (say *non-commitment*), or vice versa.

A major lesson from the foregoing discussion is the interaction between preferences and expectations. Specifically, countries will choose to accept or reject an agreement based on what they expect to get. Rationally, they are likely to go for the option that is considered more beneficial or desirable. Their decisions and positions are based on some anticipated outcome. With regard to future outcomes, the decision maker is also able to for a preference based on the desirability of an imagined outcome, and the decision maker's degree of belief "that the imagined things will take actual shape" (Shackle, 1949: 10). As a result, conflicts and deadlocks arise where there are differences in preferences and anticipations with regard to a given course of action. Such differences effectively preclude the possibility of unanimity.

4. The Threshold Perspective

If it is actually in the interest of all countries to address climate change issues, it should not be that complicated to arrive at a unanimous decision. However, even when it is obvious to a particular country that addressing climate change problems is more desirable or preferable, it may still linger on its decision or decide, until a given number of other countries decide in favor or against. How can a country that is in favor of an outcome like climate change mitigation rejects a proposal that aims at achieving the said outcome? The fact that a country can prefer one thing and do another in relation to what others are doing has been recognized as a fundamental irony. Thus, it is argued that there is no single mechanism that provides all the necessary and sufficient conditions that underlie a country's choices and actions. Some would want to follow a particular course of action; some would want to conform along the line, while some others will prefer to differ all the way. In other words, some will always go for a given option irrespective of what others are going for, while some will adapt their choices depending on the number of those that have chosen a particular option.

In line with our binary choice configuration, (where x denotes accepting a commitment and y rejection), a major tenet of this perspective is that, apart from the assumption of conscious goal-seeking preferences, a country's willingness to switch from one alternative choice to the

other (irrespective of its genuine intentions and the level of importance that it attaches to an international climate policy) may also depend on the choices and preferences of other countries. A good substantiation for this assumption can be that a good number of countries have conditioned their commitment to participating in an international climate treaty on other countries' commitment and participation. Conversely, some countries are also willing to withdraw their earlier decision or commitment if not enough countries are making similar commitments. In such a case, withdrawing from a commitment may not necessarily mean that the said country cares less about the environment. Sometimes, countries can make their respective decisions on the basis of being attracted to the majority or on the basis that others choose likewise. While Schelling (1978) defines this type of behavior as critical mass - which could be a critical number, density or ratio, Granovetter (1978: 1420), defines it as a threshold - "the number or proportion of others who must make one decision before a given actor does so". Such a perspective is considered relevant in understanding why the outcomes of international negotiations on climate change are sometimes inherently inconsistent with the intentions of the respective countries that develop them.

Notably, this threshold or critical number upon which a country's willingness to go for a particular option can differ from one country to another. As an example, some countries may be unconditionally willing to commit to any policy that aims at reducing global GHG emission, while others are only willing when at least a certain number of countries have agreed to make some levels of substantial reduction. It is also possible that some may never be willing to make any commitment. A major advantage of this perspective lies in its ability to understand the differences and heterogeneity that have characterized the behavior of international commitments to climate change. It also applies well to the situation where some countries whose choices are influenced by others still end up influencing the behavior of others countries. It is particularly suitable in those setting where some countries adopt a 'wait and see' strategy, irrespective of the fact that they would normally opt for the outcome that the rejected strategy or proposal brings about. Wait and see in this case connotes some form of conscious decision and anticipation.

As a matter of fact, there are a good number of cogent reasons that can necessitate a country's insistence on a given minimum number of participants. One ready example in this regard could be the idea of not being able to make a perceptible difference or improvement single-handedly. In a collective problem like climate change, the heroic decision of a single country (say a small island country) to do away with all forms of GHG emission may not be able save the

world at the end of the day, if others do not do likewise. A second reason could lie in the fact that it is possible for the negative externalities of one country's negligence to nullify the honest efforts of its neighboring countries. In such cases, even if the country prefers making such a cost commitment, it may be rational for it to insist on some level of likewise commitment. Otherwise, the self-sacrifice that a zero-emission decision entails could end up being an exercise in futility. Thus, a country's threshold can be regarded as an outcome of a multi-dimensional calculation regarding the dependence of a country's costs and benefits with regard to a given commitment on the choice of other countries. We could rationalize this additional assumption, using the fact that bearing a disproportionate burden of world GHG emission targets and abatement cost can undermine some of a country's competitive advantages, especially in issues like relative economic growth.

A country's threshold for deciding to make a binding commitment can be defined as the proportion of signatories to the agreement it would like to see make likewise commitments before it decides to do so. Otherwise, it considers it a waste of effort or non-beneficial to undertake a unilateral effort without corresponding commitment from others. According to Iwanaga and Akira (2002), it can facilitate the study of "the dynamics of collective decision when an individual adapts his rational decision to the others" (Iwanaga and Akira, 2002: 137). Using the threshold perspective, it is possible to observe how respective preferences of individual countries interact and aggregate. It is also possible to investigate the implications of various changes in aggregate outcome with regard to threshold distribution among countries.

As an example, if we define a country's threshold as the number of likewise commitments that can induce it to reject or accept an international agreement (given its judgment on the importance of likewise commitment to its national interest); the said country will only accept the agreements if the proportion of likewise commitments are sufficient. Normally, each country will have its own idiosyncratic definition of the number of other participating countries that it considers sufficient; perhaps sufficient to make it worthwhile to accept or to reject the proposal. As with the nature of commitments to the Kyoto protocol, some countries will always participate irrespective of others' choices. Countries of this type can be referred to as the instigators, pioneers or front liners. It is also possible that countries may never accept a given proposal. There is also a group of countries that wants to wait until all other countries make a commitment. There will also be a large group of countries with intermediate thresholds that may or may not accept a

commitment, depending on the number of participants that is sufficient to induce them into changing their respective positions. Thus, if a threshold is the minimum level of participation that induces a country to decide to make a commitment to the climate policy, it can be argued that a lower number of commitments will lead to disappointment, and disappointment will in turn lead to a lesser number of committed countries and more withdrawals. This will further lower the number of commitments until none or only those countries with a threshold of zero are left. In such a case, it will be necessary find out the motivation that underlies a country's insistence on certain level of participation.

5. Discussion

In general, we have identified what could be referred to as the main components of the complexity in the decision making process. These components include the existence of heterogeneity in preferences, sovereignty, the nature of the problem space, and the existence of interdependence. The problem space refers to the non-linearity and uncertainties that characterize some aspect of the climate change problem. In defining interdependence, we refer to the fact that the decision of one country and the attendant courses of action will have some impact on other countries. To be interdependent therefore, "states must face a set of payoffs that depend, to some degree, on the behavior of the other actor" (Kroll, 1993: 324). To a large extent, managing the complexity will entail a closer a look at the interaction between these components. First, there is nothing unusual or unheard of in these factors as far as international relation is concerned. They have always been an integral part in the study of state behavior in international relations. Second, in spite of the distinctions in these factors, a closer look at them reveals that it is possible to identify how they are systematically linked to one another in the context of multilateral climate change negotiations. To proceed with the discussion, more clarifications are necessary. Implicitly, the inclusion of "to some degree" in relation to this definition of interdependence connotes that each country has some element of control on the quality of its domestic environmental quality, regardless of other countries decisions or behavior. This type of control is referred to as reflexive control (Kelley and Thibaut, 1978). In such a case, the existence of interdependence does not necessarily eliminate a country's reflexive control and responsibility towards some improvement in its own domestic environment. Thus, the existence of interdependence cannot be used as a sufficient excuse for a country's refusal to make a commitment with regard to climate change. The same

argument goes for sovereignty and heterogeneity. The main problem in how states choose to deal with the problem of climate change lies in the ways that countries perceive or misperceive the objectives in the climate change policy. An easily identifiable influence in this regard pertains to the benefits that a country attaches to its refusal to make a commitment towards adverse climate change mitigation. Taken together, the effects of the above mentioned components on the complexity of the decision making process depends on a country's anticipation on the benefits or consequences of its decision. By focusing on the overall objective of the climate policy, the rest of our discussion points will center on these questions:

- i. To what extent does a country's preference (to reject or accept a proposal that aims at stabilizing "the concentration of greenhouse gas in the atmosphere")² depend on other countries' decision or commitment?
- ii. Are there some factors that can lessen the extent to which the dependent of a country's preference to reject or accept a commitment on others' decision? In other words, are there some factors that can more likely for a country to make a commitment that is in favor of the climate change policy, irrespective of other countries' decision?
- iii. What are the implications of the answers in questions (i) and (ii) in the debates on ESG architecture?

The first two questions are taken together, given their orientation to commitment and incentives.

a. The Commitment and Incentive Questions

Rational choice theory tells us that the acceptance or rejection of a given course of action or preference for some other alternative courses of actions are motivated by the desirability of an action's accompanying outcome and implications. As a result, in comparing the desirability of outcomes, one takes into account what one stands to get or lose. In such a case, the extent to which a country's preference or position depends on others' decision or the level of commitment to climate change may depend on the level of intrinsic benefits that it hopes to achieve as a result. Just like countries rationally aspire for economic development and advancement in other spheres of life, if a country is convinced of the disadvantages or internality of neglecting the climate change problem, it should be less motivated to reject any measure or set of measures that aim at address-

²United Nations, 1992: 4. <http://unfccc.int/resource/docs/convkp/conveng.pdf>

ing the problem. The knowledge of such internalities can minimize the temptation to act opportunistically. In such a case, unconditional commitment can even become a selfish choice, irrespective of other countries' decision. Irrespective of how beneficial ESG might be to all nations as a group, there may be weak incentives for commitment if there are no selective benefits that can stimulate a rational individual country into accepting a given decision or commitment.

With regard to the incentives that underlie a country's incentive and willingness to make a commitment to climate change mitigation, we note that since countries' preferences are reviewed on a continuous basis as more information becomes available, an increased knowledge on the internality of certain decisions can help to alter the anticipations upon which the decision to reject a given set of proposals is based. Internality in this regard could refer to the consequences or negative impacts of one's choice on oneself. Simply put, it could be the loss in future utility or benefits (particularly on other aspects one's life) that results from one's current decision to act against stabilizing the concentration of greenhouse gases, for instance. Notably, "internality can occur for a variety of reasons: lack of awareness of the consequence, ignorance about how to respond to it, or a motivational downgrading of time deferred or otherwise obscure consequences of action" (Herrnstein et al., 1993: 150). On this note, we contend that if a country is aware of the consequences of ignoring the dangers of anthropogenic interference with the climate system on its long-term domestic developmental aspirations, it will find it in its interest to be at the frontline of international commitments and mitigation endeavors.

Furthermore, based on the impossibility that some of the implications (such as non-imposition, non-dictatorship, and equity) of the conditions in collective decision making theories suggest, it is important to note that any option that aims at minimizing the complexity in ESG will involve addressing the ignorance or informational deficiency, as well as the motivational foundations that underlie a country's decision to reject a mitigation proposal, given the positive interaction between a country's expectations and decisions. Thus, if the grounds of a country's motivation to reject a given commitment to climate change are addressed, it should naturally adapt its choice to the new realities.

b. Implications for the ESG Architecture

We base our opinion in this section on the definition of ESG architecture as "the overarching system of public and private institutions, principles, norms, regulations, decision-making proce-

dures and organizations that are valid or active in a given issue area of world politics” (Biermann et al., 2007: ii). As with any collective decision making problem, the effects of a given institutional arrangements or architecture on the outcome of ESG have given rise to an intense debate. As Harro and Zelli (2012: 4) note, “much of the climate policy literature is still preoccupied with asking questions about which climate governance architecture is more effective in reducing emissions, more equitable and just, more economically efficient more politically viable, etc.”. Essentially, the debate centers on issues related to the problems that characterize the existence of various layers of decision-making, as well the advantages and disadvantages of fragmentation and integration.

In view of the collective decision-making complexity, it has been proposed to adopt an entirely different approach in the next stages of negotiations. In Reinstein’s view “rather than a politically driven top-down approach to commitments, each country needs to determine for itself, from the bottom-up, what might be technically, economically, socially and politically acceptable in light of its own national circumstances” (Reinstein, 2004: 304). Specifically, Reinstein’s suggestion calls for considering different kinds of commitment; an approach that is similar to multi-lateral trade negotiations, in which each country identifies a contribution to emission reduction that is best suited to its national circumstances. Based on the implications of this suggestion on the achievement of a unified commitment, it is argued by Biermann et al. (2007) that this proposal could result in more fragmentation in climate governance architecture. Furthermore, Biermann et al. (2007) argue that fragmentation will be a dominant liability to general performance. In their view, a unified architecture will mean “a situation in which all countries of relevance in a given issue area (a) are subject to the same regulatory framework; (b) participate in the same decision-making procedures (are at least formally represented in such procedures); and (c) agree on a core set of common commitments” (Biermann et al., 2007: 2). Thus, commonality in commitment is referred to as an ideal situation. However, recognizing that achieving such a situation may be unrealistic in a world of diversity and differences, Biermann et al. (2007) argue that a second best option would involve having an integrative fragmentation, rather than conflictive fragmentation.

Our first observation in this regard relates to some of the negative effects that are attributed to fragmentation. It is argued that apart from leading to disintegration and increased polarization, fragmentation can undermine the achievement of the global interest and compliance. In

addition, it could lead to significant competitive disadvantages between countries with strict policies and those countries that have no commitment or pledges (Biermann et al., 2007). Theories on collective action however suggest that there is a correlation between group size and the complexity of the decision-making process. As an example, Olson (1965) notes that, the larger the group size, the more difficult it will be to reach an agreement. Notably, “for the larger the size of the group, the more difficult it will be to locate and organize even a subset of the group, and those in the in the subset will continue bargaining with others in the group until the burden is widely shared, thereby adding to the expense of bargaining” (Olson, 1965: 46). Thus, one of the advantages of relatively smaller groups is said to lie on the relative ease of the decision-making process.

In our opinion, irrespective of the disadvantages or disadvantages of fragmentation, we note that if the incentives are right, a country will always act in a manner that maximally meets its interests. Taking the main objective of climate policy, as stated in article 2 (United Nations, 1992) as an example, we argue that a country’s commitment depends on the extent to which it values the benefits of stabilizing greenhouse gas concentrations on its national interests, such as ecosystem, domestic welfare and overall sustainable development. If the objectives of fragmented institutions are in line with the climate policy, the outcome should be similar or at least compatible with the outcome of a centralized architecture. Differences in outcome will only result from the synergy that is associated with large scale cooperation. A good example in this regard will be the proliferation of bilateral and regional trade agreements in spite of the deadlocks that typify negotiation in the World Trade Organization (WTO). Another ready example involves the increase in the number Bilateral Investment Treaties (BIT), following the disagreements that rocked the development of a Multilateral Investment Treaty. The aims in each of these situations (the enhancement of world trade and international investment) have endured at regional and bilateral because of the selective benefits they embody with regard to respective national interests.

Thus, the main problem in ESG should not be whether institutions are fragmented or integrated. Instead, the main problem should be the extent to which a country identifies its developmental aspirations and aims in its climate policy. This perspective boils down to our initial argument on the role of internality in a country’s decision. The use of an idealized normative argument in favor of cooperation may not be sufficient to induce increased commitment. On the other hand, if a country is aware of the costs and burden that rejecting a prevention and mitiga-

tion call will bring about; particularly with regard to its environment, public health, energy security and sustainable economic development in the long-run; such knowledge may be able to alter its incentive to reject any initiative or proposal that can address such internalities. Instead, it will find it in its self-interest to engage in any agreement that will further the reduction and stabilization of greenhouse gas emission.

6. Conclusion

A country's decision to reject or oppose a proposal in a multilateral decision making is associated with a large number of factors. From a rational perspective, the main problem in how states choose to deal with the problem of climate change lies in the ways those countries perceive or misperceive its vulnerability to climate changes. Another easily identifiable influence pertains to the benefits that a country attaches to its refusal to make a commitment towards adverse climate change mitigation. Thus, a country's decision or the level of commitment may depend on the level of intrinsic benefits that it hopes to achieve as a result. Apart from debunking the ignorance upon which some the decisions are based, the investigation of a country's selective payoff in respect to its decision is therefore paramount in any effort that aims at enhancing cooperation. Such an investigation is necessary for determining the immediate and long-term optimality or sub-optimality of a given choice for the country in particular. Sub-optimality could refer to the negative internalities that accompany a country's decision. Given the positive interaction between a country's expectation and decision, we conclude that any option that aims at minimizing the complexity in ESG should include addressing the informational deficiency or ignorance that underlie some country's decision to ignore the need to prevent and stabilize the accumulation of dangerous greenhouse gases in the atmosphere.

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