Montserrat Koloffon Rosas
Vrije Universiteit Amsterdam

Contact: montserratkoloffon@gmail.com

Regime Effectiveness Reconsidered: Achieving the SDGs
Conference Paper

"We live in a complex world, and we must understand it as such.
The opposite of complexity, is laziness."
- Daniel Innearity

Abstract

In the field of social sciences, specifically the sub-fields of political science known as *Global Environmental Governance* and *International Environmental Politics*, the topic of regime effectiveness has been studied for at least three decades. At the core of this sub-field is the goal of identifying the drivers of effectiveness for international agreements or treaties. The growing literature around this topic has analysed several different concepts as possible explanatory variables of (environmental) regime effectiveness and yet, questions about drivers of effectiveness remain only partially answered. Unfortunately, the difficulties faced on the analytical level still translate in most cases into unaccomplished goals and thus, continued deterioration in multiple sustainable development issue areas. This paper shows an example of the multiple benefits of taking an interdisciplinary approach to study regime effectiveness. On a first instance, this allows researchers to expand their methodological toolkit, yet further implications come from the use of integrated assessment models, which enable a better understanding of the dynamic behaviour of the regime's design components and uncovers important mechanisms to ensure impact effectiveness. This analytical framework is promising to make the implementation of the SDGs in the Decade of Action as efficient as possible.

Montserrat Koloffon Rosas
Vrije Universiteit Amsterdam

Acronyms

HLPF	HIGH LEVEL POLITICAL FORUM ON SUSTAINABLE DEVELOPMENT
IEA	INTERNATIONAL ENVIRONMENTAL AGREEMENT
MDGs	MILLENNIUM DEVELOPMENT GOALS
SDGs	SUSTAINABLE DEVELOPMENT GOALS
UN	UNITED NATIONS
UNCHE	UNITED NATIONS CONFERENCE ON THE HUMAN ENVIRONMENT
UNGA	UNITED NATIONS GENERAL ASSEMBLY
VNR	VOLUNTARY NATIONAL REVIEW

1. Introduction

In 1972 the United Nations Conference on the Human Environment (UNCHE) took place in Stockholm. This conference marked a turning point for the field of global governance, both on a practical and on an academic level. For example, an estimation indicates that more than half of the 140 multilateral environmental treaties adopted since 1921 up to that point, had been concluded after this conference (Haas, et al., 1992). Sometimes referred to as a "catalytic" event (Wettestad & Andresen, 1994), this conference kindled not only the creation of several multilateral environmental treaties, but also gave origin to the formal study of environmental politics (Zürn, 1998) as a subfield of political science.

The topics of interest of this sub-field have evolved over time. With the rapid increase of international treaties, the first years were dedicated to the study of international regime formation. Additionally, in this early stage a debate around whether regimes actually even mattered took place between the so-called neorealists and the neoliberal institutionalists (Helm & Sprinz, 1999). Once the debate settled, with the neoliberal institutionalists concluding that international regimes do make a difference, the interest shifted towards understanding *how* they make a difference. This gave room to the observation that the degree to which problems governed by international regimes were solved varied significantly across cases, and the necessity for a more sophisticated measurement of regime effectiveness emerged.

Since the 1990's, this field has worked towards understanding the characteristics that make a regime be effective. Despite major methodological limitations that scholars in this field have had to face, some aspects have been identified in the literature as key components to achieve effectiveness. To a certain extent, the insights coming from this academic field have informed practitioners and have been implemented. Unfortunately, more often than not, regime success is still challenging to accomplish.

Some theories postulate that finding panaceas for effective regime design is an unrealistic approach. They argue that the regime design will inevitably change from issue area to issue area, and that instead the focus should be on designing regimes with a good "fit" to the problem (Young O. R., 1994; Ostrom, 2007). This is a valid observation when it comes to policymaking, but it would be especially discouraging for the SDGs to assume the "good fit" theory to be the case on the level of regime design.

The UN's 2030 Agenda could be considered a *sui generis* international regime given its large scope. This international agreement is not concerned with a single issue area, as most international treaties usually are. Instead, this one integrates 17 goals, known as the SDGs, in one single agenda, taking into account some international regimes that are already in place to govern certain specific areas. Talking about a "good fit" from regime to issue area is of little help with such a broad coverage of topics under the umbrella of sustainable development.

Achieving regime effectiveness for the 2030 Agenda, is however one of the most pressing challenges in the years to come for the international community. Indeed, four years after the launching of the 2030 Agenda, "the UN Secretary-General called on all sectors of society to mobilize for a decade of […] ambitious action to deliver the Goals by 2030", also referred to as "The Decade of Action" (United Nations, 2020). This paper shows how taking a multidisciplinary approach allows studies on global governance to expand their methodologies and come to an improved understanding of regime

Montserrat Koloffon Rosas
Vrije Universiteit Amsterdam

effectiveness drivers. This in turn will be a valuable contribution towards finding the most efficient ways to achieve the SDGs in the Decade of Action.

This paper is organized in five sections. Section 2 consists of a review of the literature around the topic of regime effectiveness. In section 3, the regime theory is outlined by defining the key variables from the effectiveness literature, and finding their links connecting them in a single integral model. Section 4 presents the methodology used in the field of system dynamics, and section 5 presents how that methodology can be applied to the regime effectiveness theory and used to evaluate the SDGs regime. Finally, insights from the analysis are discussed, followed by a reflection on the implications and areas for future research in the conclusion.

2. Literature Review

Regime effectiveness can be studied from different angles. In order to summarize the insights from this field, it is useful to differentiate among three dimensions: 1) measuring effectiveness, 2) identifying effectiveness drivers, and 3) understanding regime effects[1]. The first dimension has in turn 3 sub-tasks summarized in (Underdal, The Concept of Regime 'Effectiveness', 1992) as 1.1) defining regime effectiveness, 1.2) determining the standard for evaluation, and 1.3) developing operational methods to measure effectiveness (see figure 1)[2]. Unfortunately, what we find in practice is that more often than not, these dimensions were not clearly specified in the literature, causing a great deal of conceptual unclarity.

1) Measuring effectiveness

All studies following this line of research address at least the first sub-task of the first dimension. Initially, there is vast consensus around the most intuitive definition, namely, regime effectiveness as the extent to which it is helping to solve the problem that motivated its establishment, also referred to as impact effectiveness. Sooner or later however, "to collect data, the analyst must identify appropriate proxies of the study's theoretical constructs" (Mitchell & Bernauer, 2004), and impact effectiveness happens to be an especially thorny one. Methodological limitations to measure this construct become evident given the difficulty to isolate the causal effects from the regime contributing to problem-solving from any other external influences.

Fig. 1: First dimension – Measuring effectiveness
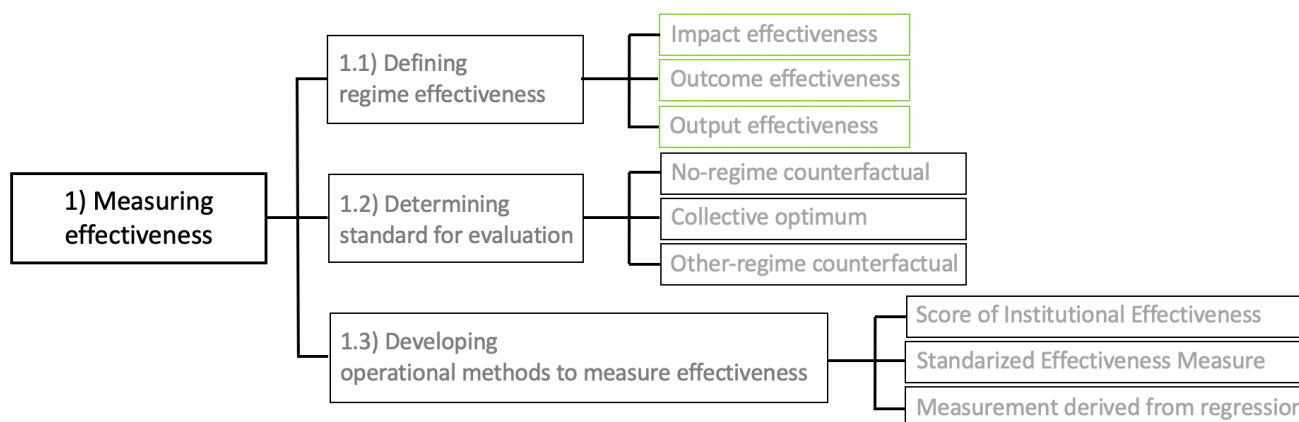
As a consequence of this situation, the conceptual consensus found initially is lost when it comes to its operationalization. Some authors came up with proxies aiming to capture the underlying idea of impact effectiveness, and others came up with entirely new conceptualizations, often with questionable construct validity and endogeneity problems, to replace the dependent variable with an easier one to

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[1] The third dimension, while crucial to engage in a process of continuous improvement, remains out of the scope of this paper.

[2] The 2nd and 3rd sub-tasks are addressed in more detailed in the extended version of this paper. Here, given space limitations they have been left out. Please contact the author if you would like a copy of the full paper.

measure. This results in a confusing situation where a certain conceptualization ends up being used as an alternative dependent variable in some cases, and as an independent variable in others. In the end, eight different definitions for the concept of regime effectiveness can be identified in the literature of this decade alone.

2) Identifying Effectiveness Drivers

The second dimension is to determine what characteristics in the regime design account for its level of effectiveness, ie. identifying the effectiveness drivers. It is of course important to point out, that the effectiveness drivers will depend on the object of study, ie. the conceptualization of effectiveness determined in the first sub-task. The ability of this academic field to make useful contributions to practitioners depends on successfully attending the second dimension.

Fig. 2: Second dimension – Identifying effectiveness drivers
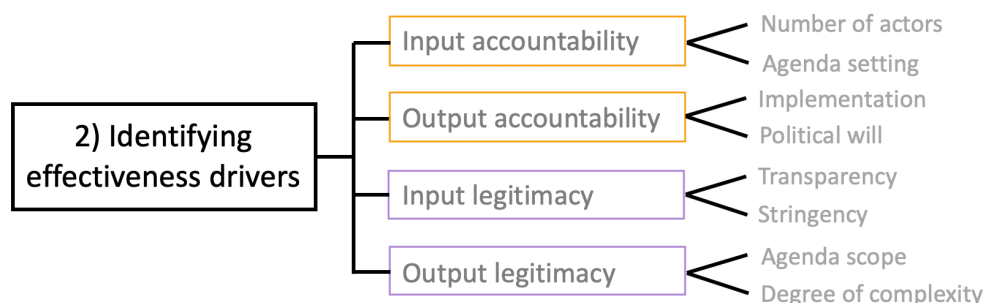
Note: the operationalizations on the right column are not an exhaustive list. See the third column in table 1.

In this dimension, we can distinguish between the characteristics of the process followed to reach decisions, and the characteristics of the decisions themselves. Kramarz & Park (2016) speak about "two tiers of environmental governance: the design of institutions, and the execution of interventions". The first one involves the regime design process, and the functioning of international organizations in the cases where they are involved, whereas the second one refers to the actual policy, regulations to follow, or the goals to reach. The two levels are closely related to each other since, per definition, we should expect an effective process to lead to effective decisions.

This distinction allows us to theorize that at least for the first tier, there may be some general characteristics that enables the capacity to *design* and implement effective policy. This last point refers to the ability of correctly diagnosing the problem at hand (which requires making an accurate distinction between the symptoms and the causes) and the design of a fitting solution to address the cause. In other words, effective solutions may look entirely different from one another, but the process to get to effective solutions is likely to be similar in every case. This work is more concerned with regime design, and thus the procedural level[3].

3. Theory and definitions

The dependent variable: defining regime effectiveness

Impact effectiveness

Impact effectiveness is the main dependent variable of interest. In order to solve shared (environmental) problems on the global scale, governing regimes are agreed by the international

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[3] In relation to the operational level, I agree that policy itself may look completely different and have different characteristics from one issue area to the other, however, I see no reason why general characteristics of effective policy could not be identified. In fact, I consider this a necessary task to move from aiming for effectiveness only, to aim both for effectiveness, and efficiency.

community to coordinate action towards the solution of the problem. Impact effectiveness refers to the extent to which the regime successfully contributes to the solution of the problem at hand. While it could be tempting to compare the situation around the problem before and after the establishment of the regime and measure the level of effectiveness in terms of the extent in which the trends of concern have changed, this cannot be done in such a straightforward fashion without rigorously controlling for intervening variables. Furthermore, it is only possible to conduct this analysis in retrospective, once the data is available to examine it. While it is useful learning from past experiences, provided that all the methodological requirements are taken care of, the limitations of this approach pushed the creation of alternative ones. One proxy for impact effectiveness worth mentioning here, is the notion of *regime persistence* by Young (1992), who theorizes that the simple survival of the regime is already a good sign that it is having some positive effect, since one could expect that the regime members would not have an interest in keeping it otherwise.

Outcome effectiveness

Outcome effectiveness is broadly defined as the ability of the regime to change the behaviour of those whose actions are relevant to the problem (Levy et al., 1991). Since it is by correcting certain behaviours that the problem gets solved, outcome effectiveness can be theorized to be one causal link away from impact effectiveness (Keohane & Nye, 2001; Mitchell, 2003). Upon inspection of the different conceptualizations for regime effectiveness found in the literature we find that three of them actually refer to different *forms* of behaviour change, hence, serving as distinct operationalizations for the outcome effectiveness variable.

The first of the three conceptualizations fitting the category of outcome effectiveness is the notion of *implementation*. Also referred to as process effectiveness, this operationalization looks at the extent to which regime provisions are implemented in the domestic legal and political systems of the member states. The second operationalization is so closely related to the first one, that they are often used indistinguishably in the literature. It focuses on *compliance*, or the degree to which member states adhere to the regime requirements. Both *implementation* and *compliance* are also closely related to *effectiveness as goal attainment* (Wettestad & Andresen, 1991). The third and last one is called *constitutive effectiveness* and it is the extent to which the regime formation alone gives rise to a social practice involving the expenditure of time, energy, and resources on the part of its members (Young O. R., 1994).

Output effectiveness

Output effectiveness refers to the substantive arrangement of the regime itself (Underdal, 1992), this includes its norms, principles, and rules (Helm & Sprinz, 1999). Since a good regime design is what potentially causes a change in behaviour, output effectiveness can be theorized to be one causal link away from outcome effectiveness, and two causal links away from impact effectiveness (Keohane & Nye, 2001). One operationalization that fits this category is the idea of *scientific congruence* advanced by Wettestad and Andresen (1991), who theorize that an effective regime design would show a certain degree of correspondence between institutional outputs and expert advice.

The independent variable: identifying effectiveness drivers

Accountability

Accountability can be understood as a "more or less coherent set of rules and procedures, delineating who takes part in decision-making, who holds whom responsible for what kind of actions, and by which means" (Chan & Pattberg, 2008). In this sense, *input accountability* refers to the first part of the previous definition, namely it determines who takes part in decision-making. In this regard, it has been noted that the increase in number and type of actors does not widen the accountability gap per se, "but the lack of legitimacy of novel actors and the non-transparent nature of the restructuring process" (Chan & Pattberg, 2008).

Going back to the initial definition of accountability by Chan and Pattberg, *output accountability* refers to the second part, ie. determining who holds whom responsible for what, and how. It is through *output accountability* mechanisms that authority holders are held responsible and answerable for their actions (Kramarz & Park, 2016). In other words, it is the "oversight of operations, or accounting for results or

impacts" (Davenport & Low, 2013), which means that *output accountability* ensures regime implementation, or outcome effectiveness.
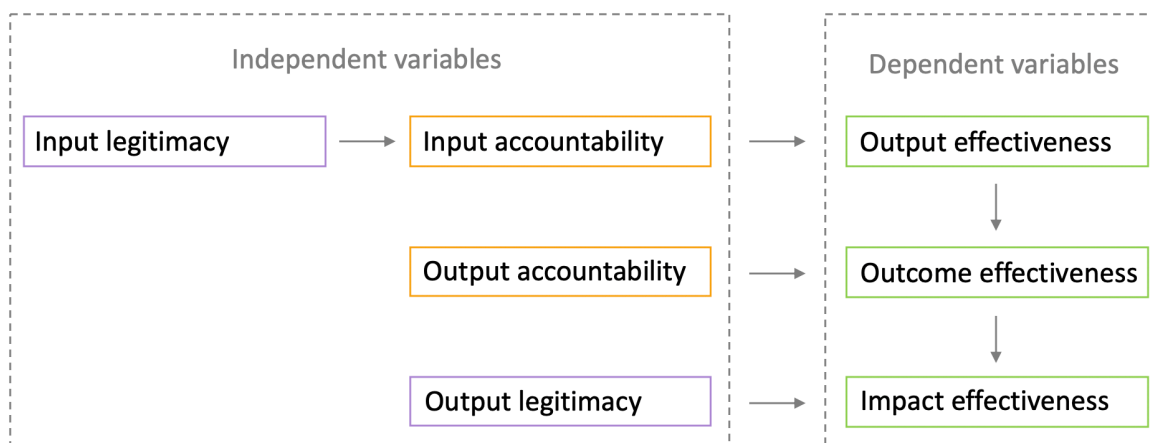
Legitimacy

Legitimacy refers to the quality that makes the holding of authority and power acceptable. In its normative dimension, legitimacy is based on democratic principles, and "if international institutions are to be legitimate […] their practices and the results of their activities need to meet broadly democratic standards" (Keohane & Nye, 2001). When focusing on institutional legitimacy, it is also helpful to distinguish between the input and the output side.

Input legitimacy is closely related to the concept of *input accountability*. In a democratic system, who takes part in the decision-making process is determined through elections. It is also through elections that the decision makers are held accountable for their actions. On the international level, the lack of "an acknowledged public, operating within a political community in which there is a general consensus on what makes public decisions legitimate" (Keohane & Nye, 2001) makes it harder to ensure (input) accountability. *Input legitimacy* can thus said to be present when "the process conforms to procedural demands, such as representation of relevant stakeholders, transparency, and accountability" (Bäckstrand, 2006).

Thinking again in terms of a national democratic system it is clear that legitimacy is not only determined by the procedures used on the input side (Keohane & Nye, 2001). Instead, the issues conforming the political agenda, and the extent to which they are being addressed also play a role. In this sense, *output legitimacy* refers to the regime's substantive outputs, or its goals and problem-solving capacity (Bäckstrand, 2006). This implies that *input legitimacy* (ie. procedural democracy on the input side) is necessary but not sufficient to ensure *impact effectiveness*. Conversely, *output legitimacy* (ie. substantive outputs) is considered to be present when high levels of *impact effectiveness* are observed.

Fig. 3: Causal links between IVs and DVs

In summary, *input legitimacy* and *input accountability* are closely related to each other and can be said to be the variables directly affecting the substantive arrangement of regimes, ie. *output effectiveness*. The regime's substantive arrangement, together with the mechanisms to hold those in power accountable for the regime implementation, ie. *output accountability*, influence *outcome effectiveness*, or the change in behaviour caused by the regime. Finally, this change in behaviour, together with the regime's problem-solving capacity, ie. *output legitimacy* ensure the regime's *impact effectiveness.*

4. Methods

The previous section shows the relationship of the most predominant variables discussed in the literature as regime effectiveness drivers. Given that both the dependent variable and independent variables around the topic of regime effectiveness are distinguished in different dimensions, a representation like the one shown in Figure 3 is already helpful to avoid falling into the trap of expecting

an effect of a certain independent variable on the wrong dimension of the dependent variable. A caveat is that while this representation shows the theorized relationships, it is not yet helpful to explain their actual behaviour. From this very representation, one can still engage in the debate of whether accountability efforts need to be scaled-up, or different design mechanisms need to be designed to have an impact on effectiveness.

The limitation from this representation stems from the fact that the variables are represented in a linear fashion, not accounting for the feedback loops that are likely to be present in the system. A more realistic approach would adopt a circular arrangement of the variables, capturing the cyclical nature of the regime formation and implementation system. This is the logic behind the methodology used in the field of system dynamics. The main principles are introduced in the next section.

Thinking in terms of systems

Feedback loops

The literature studying global (environmental) governance does so operating from a linear, non-feedback paradigm. In reality, the mere accountability mechanisms, such as reporting and monitoring serve as feedback forces. A much more realistic perception would be one "in which a problem leads to action that produces a result that creates future problems and actions" (Forrester, 2009). This requires the use of feedback loops.

"A feedback loop occurs when a change in something ultimately comes back to cause a further change in the same thing" (Harich, 2016). One single feedback loop is a closer representation of reality, and yet, the building of these type of models requires great analytical care and a solid theoretical foundation. While it could be argued that this is always the case regardless of the methodology used, with this approach it becomes very evident how conclusions about reality, can only be as good as the quality of the model.

The practice of building conceptual models based on feedback loops (instead of linear causality), is commonly referred to as "systems thinking", and it was first introduced by Peter Senge in his renowned book 'The Fifth Discipline' (Senge, 1990). In it, he distinguishes between the only two types of feedback loops: reinforcing loops, and balancing loops. The first, refer to a positive relation and are also known as positive loops. The latter type cause changes in an opposite direction, for which they are also called negative loops.

Interestingly, balancing loops promise to hold the explanation for situations such as "the accountability paradox". Balancing loops are more difficult to identify than reinforcing loops, because the sign that they are present is precisely that nothing is happening. In the words of Senge (1990): "balancing process maintains the status quo, even when all participants want change. The feeling, as Lewis Carroll's Queen of Hearts put it, of needing 'all the running you can do to keep in the same place' is a clue that a balancing loop may exist nearby".

If the system we are trying to understand is very simple, recurring to linear causality may prove to be helpful. When working with simple systems, the added value of representing it as a feedback loop instead of linearly, is gaining a deeper understanding about the underlying dynamics. On the contrary, when the system under analysis is complex, and we recur to linear causality, or even simple loops, the conclusions drawn are "often completely opposite from the behaviour of more complex systems". The human brain is capable of deriving the behaviour of the system in simple cases but moving to a system just a few orders of magnitude more complicated, it becomes impossible to anticipate the system behaviour without recurring to computational simulation models.

All simulation models start from the building of a causal loop diagram, a representation of all the model variables organized in feedback loops. This alone can already offer insight in the components of the system that may be missing, or even on why a certain behaviour may be observed. To have an accurate understanding however, as well as to design interventions to correct the system, the description of the system present in the causality diagram must be replaced by level and rate equations in order to be able to simulate the model, and design solutions based on the parameters uncovered by the model (Forrester, 1994).

In the following section, a preliminary causal loop diagram is built for the linear causality model shown in Figure 3. Based on this model, the SDGs are evaluated as empirical examples in an attempt to draw conclusions to improve their effectiveness.

5. Analysis

*The three-loop model of regime effectiveness*

Finding the loops

We begin by recognizing the connections that already exist in the linear causality model. Regime effectiveness theories sustain input legitimacy ensures (input) accountability, which in turn has the power to determine the regime's substantive arrangement. This is the point where it is important to recognize that this is not the end of the story. Instead, the actual arrangement of the regime will probably be one making further accountability possible, and as such, further increasing its input legitimacy. This is the first loop and given that the further change was in the same direction, it is a reinforcing loop.

Moving to the next node in the model, we have outcome effectiveness. Here, in theory, holding those in power to account, and carrying out oversight operations (output accountability) is expected to contribute to the regime implementation and changing the behaviour of those whose actions are relevant (output effectiveness), however the extent to which this has been the case remains unclear.

The dynamic likely at play is that outcome effectiveness is being understood as formalizing mechanisms of accountability, which leads indeed to higher levels of output accountability, and with that, by definition an enhanced outcome effectiveness. This is also a reinforcing loop, but note that it is only reinforcing the creation of even more accountability mechanisms. Like Forrester (1991) points out, "if the policies being followed are believed to alleviate the problem, but, in hidden ways, are causing the problem, then, as the problem gets worse, pressures increase to apply still more strongly the very policies that are causing the problem". This appears to be the case with regime effectiveness: all efforts are focused in complying with the functional requirements, and little attention is left for the mitigation of the actual problem. As a result, the few efforts taken towards achieving impact effectiveness are always lacking.

This brings us to our last node, impact effectiveness. The previous loop made clear that (paradoxically), an increase in outcome effectiveness leads to a decrease in impact effectiveness. There is an unexpected inverse relationship (represented by dashed arrow in figure 5). Finally, the less improvement made towards solving the problem that motivated the creation of a regime, the less output legitimacy the regime will have. The less output legitimacy, the harder achieving impact effectiveness through the regime will become because confidence in its problem-solving capacity has been lost. Again, while negative, the relationship is in the same direction, so we have a third and last reinforcing loop. The reconfiguration of the linear causality model in terms of feedback loops offers the possibility to gain an overview of the whole system at work and spot the problematic areas in need for correction.

Fig. 4: Three-Loop Model of Regime Effectiveness

Montserrat Koloffon Rosas
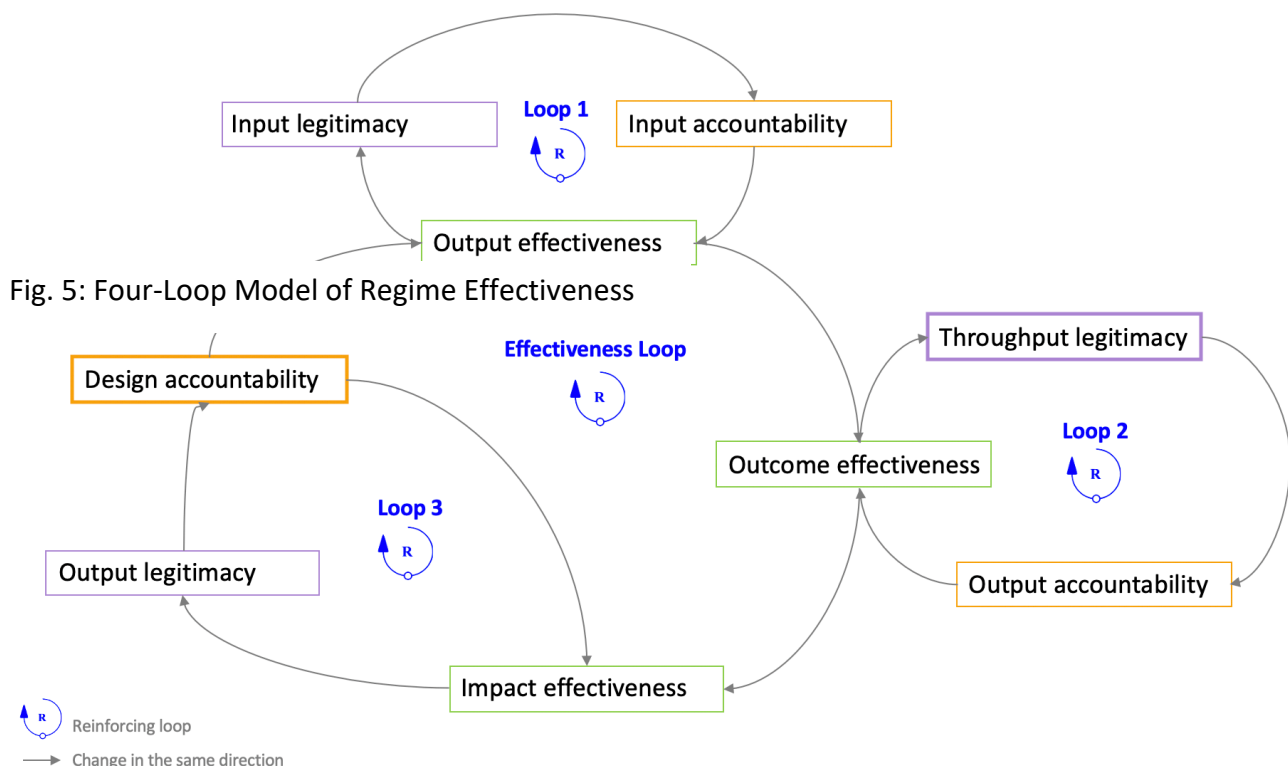Vrije Universiteit Amsterdam
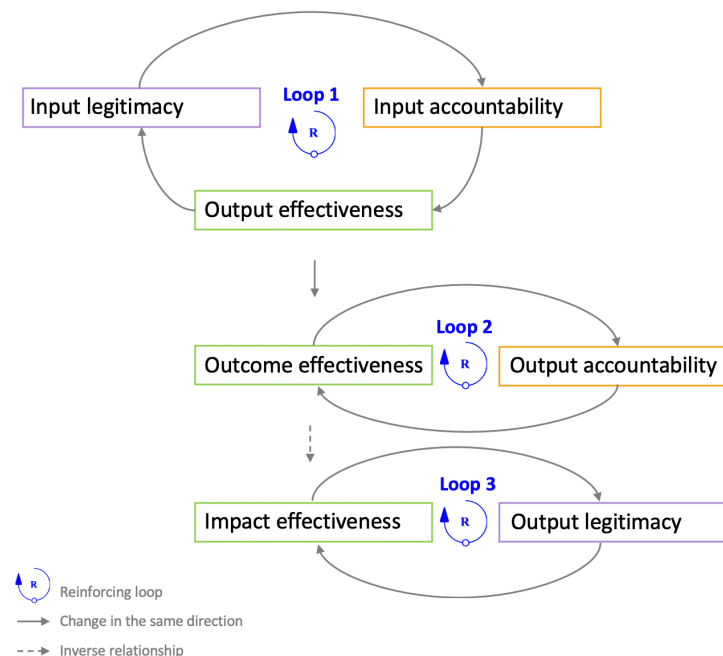
With a linear causality approach it is hard to grasp the relevance of a certain component for the entire functioning of the system. Fortunately, we are now working with a causal loop diagram. At this point it is worth asking what would be required to change the behaviour of the system in order to bring about the desired results. The precise fine-tuning of the system can only be achieved by running an actual simulation model, in which the precise parameters of each variable can be estimated much more accurately. However, a simulation model always begins as a causal loop diagram. It is at this stage that potential missing components in the system can be first spotted.

By building the causal loop diagram, it became clear that the problem begins in the second loop. Outcome effectiveness has come to be seen as an end in itself, which has led to an increase in output accountability, but no progress is made towards the actual solution of the problem.

Is the solution then to get rid of accountability measures? Hearing that more accountability measures are only resulting in less progress, it could be tempting to jump into a simplistic solution like that. Looking at the causal loop model, however, we see that outcome effectiveness (ie. change in behaviour) is a necessary step to arrive at impact effectiveness. What is required is to change the negative relationship that currently connects the outcome and impact effectiveness nodes. If we are not to eliminate output accountability, then maybe the solution is that a certain key component is missing. I argue that indeed, this loop is missing a legitimacy node, in order to ensure that those in power are being held accountable *to change the actual substantive behaviour* that will lead to problem solving. I refer to this as *throughput legitimacy*. This label fits then the function of the missing node to sort the wheat from the chaff, and ensuring that output accountability is focusing on the goals that will contribute to achieving impact effectiveness.

A valid question to raise here would be how those being held accountable are supposed to know what will work. The lack of a clear answer to this question is in the end what brought us to where we are. The ones in power can only be held accountable to do the right thing, only when the right thing to do is known. This is pointing to yet another missing component in the system.

Throughput legitimacy must be informed by a mechanism ensuring the accountability of regime and policy design for the common good. This mechanism would be responsible to make sure that the solution designs are not responding to the interests of a single governance institution. Instead this accountability mechanism would ensure that a valid process is being followed to accuratey diagnose the problem, and that "interventions" are designed solely for the purpose of problem solving for the common good, ie.

Fig. 5: Four-Loop Model of Regime Effectiveness

Montserrat Koloffon Rosas
Vrije Universiteit Amsterdam

impact effectiveness. This mechanism would also help to bring transparency around potential conflicts of interest that would usually go unnoticed, or not raised given the potential consequences that this could bring to the one bringing it to attention. Clearly, this component is missing in the third loop. Furthermore, this important node can play the role of closing the loop between all effectiveness nodes, capturing more realistically how regime design actually works. If there is a breakthrough in the analysis of the problem with implications to the solution design, this would probably feed back into the substantive arrangement of the regime, or output effectiveness.

Case study: the effectiveness of the UN's Sustainable Development Goals

Loop 1: Input accountability, output effectiveness, and input legitimacy

The first loop is about representation, inclusiveness, and the openness to contributions in the regime design process. This should ensure output effectiveness, or the setting of goals that are ambitious, but always responding to the interest of those being governed. "Those being governed" in the case of the 2030 Agenda happen to be the people all around the world, which speaks for the size of the challenge that this regime faced in ensuring input accountability. Indeed the UN had once already received criticisms for failing at this stage with its predecessor agenda on sustainable development: the Millenium Development Goals (MDGs).

During the intergovernmental policymaking process leading to the formulation of the SDGs, "the UN consulted worldwide nearly ten million people for their views" (Sénit, 2017), an unprecedented effort described as "the most inclusive and transparent negotiation process in UN history" by Ban Ki Moon (United Nations, 2015). Different mechanisms were in place, including "direct participation in formal sessions of negotiations, hearings with […] the OWG, global surveys, 11 global thematic consultations, and 88 national consultations and 5 regional consultations" (Sénit, 2017).

With all these remarkable actions, it would seem appropriate to qualify the level of *input accountability* of the SDGs as high. In the end, they did produce an agenda which complied with the requisites set during the Rio+20 Conference. Interestingly, it consisted of 17 goals, an odd number which in itself seems to prove that this was a genuine negotiation process, and not just a "David Letterman-style top 10 list"[4]. In spite of that, the civil society consultations for sustainable development have been judged as lacking for a variety of reasons, but mainly because of limited legitimacy of the consultations themselves (Sénit et al., 2017), ie. low input legitimacy.

In summary, despite valid weak spots found in existing literature especially about input legitimacy (Sénit et al., 2017), we must recognize that unparalleled efforts are being led by the UN to improve its input accountability. The output effectiveness is manifesting in the form of an agenda formalizing the importance for accountability and legitimacy, manifesting the reinforcing characteristic of the feedback loop. Furthermore, the agenda includes 17 goals, which were agreed on following a more participative and transparent process than their predecessors. One thing to keep in mind is that even with large consensus for this format, the extent to which the goal-based approach will yield the desired results is not clear yet.

Loop 2: Throughput legitimacy, output accountability, and outcome effectiveness

Moving from output effectiveness to outcome effectiveness, as Bernstein (2017) puts it: "even if the goals were perfectly designed […] they would still require appropriate governance arrangements to diffuse them and integrate them into institutions, policies, and practices". Staying on the global level for the analysis, the United Nations has an important leadership potential given that the Nations have Mandated the UN to "follow up, monitor, and review all commitments related to sustainable development, as well as to mobilize means of implementation" (Bernstein, 2017). The High-level Political Forum on Sustainable Development (HLPF) was created to lead this effort.

Unfortunately, the way in which the HLPF is operating leaves much to be desired. It does carry out some output accountability activities, but its main "approach has been the 'follow-up and review' of SDG implementation through thematic and voluntary national reviews (VNRs), implemented as a rather soft

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[4] This opinion was shared on June 9th 2020 by Prof. Pamela Chasek during the Plenary on The Transformative Potential of the SDGs, in the framework of the International SDG Research Symposium GlobalGoals2020.

peer-learning mechanism" (Beisheim, 2020). Not only is this process weak, but upon inspection of the reporting guidelines for the VNRs, it misses entirely the concept of throughput legitimacy conceptualized in the previous section. This means that, taking too seriously the principle that review processes will be voluntary and country-led, the HLPF misses the opportunity to make general recommendations on a substantive level. As a result, the only guidance that the member states can receive is hearing from the best practices that seem to be working in other places. This is useless to a certain extent, given that effective policy in one place, may not be transferable to another one (see the discussion in section 2.2). Like this, the HLPF is missing the chance to "orchestrate" the implementation efforts towards impact effectiveness.

Loop 3: Design accountability, impact effectiveness, and output legitimacy

The way in which the HLPF could be reformed and contribute much more to goal attainment brings us to the third loop. As determined previously, in order to enable impact effectiveness, *design accountability* must be included in the system. The HLPF should go the extra mile by analysing commonalities in the policy-design process in the places that are reporting successes and make the findings available in the form of guides or policy making tools. This would position the HLPF in a role of actual guidance and orchestration. At the same time, peer-learning would prove to be advantageous, moving the process for the countries from being yet one more requirement to comply to, to an interactive process of favourable mutual learning. Insights drawn from this last cycle must of course inform back to the loop 1, whenever an insight proves to be so significant that the substantive arrangement of the regime could consider to undergo modifications.

6. Conclusion

In this work, I have presented system dynamics as an analytical framework to evaluate and improve regime effectiveness. The main contribution shows how valuable insights in the form of high leverage points of the system can be drawn simply from linking the studied variables in a causal loop diagram.

Based on the Four-Loop Model of Regime Effectiveness, the regime design structure of the SDGs is evaluated. While areas of improvement can be identified for most nodes, in general, most components of the system have received attention, with clear unprecedented efforts put forward to improve these aspects. The worrying observation is that indeed the notion of throughput legitimacy, and design accountability are not at all present. The HLPF could fill this gap without the necessity of very radical changes, or the need for large investments.

The message of this study is an optimistic one: gaining an in depth understanding of the dynamics behind regime effectiveness can be achieved using the analytical framework introduced in this paper. The implications could be significant in face of the urgent need of achieving impact effectiveness as efficiently as possible. Future areas of research obviously revolve around the completion of this analysis through the building of a simulation model. Furthermore, the node of *design accountability* could turn into an entire line of research in itself, facing the challenge of answering the question of how to best diagnose a problem to ensure that the policy design is tackling its root causes. For the SDGs this probably implies taking much more seriously the synergies across goals, in order to design policy that leads to the achievement of related goals simultaneously.

Montserrat Koloffon Rosas
Vrije Universiteit Amsterdam

ANNEX

Table 1. Dependent and independent variables from regime effectiveness literature

Authors	1.1) Effectiveness definition	2) Effectiveness drivers
Levy, Osherenko, & Young, 1991 (Dartmouth group)	1. Impact Effectiveness - Success in solving the problem that motivated its establishment 2. Outcome Effectiveness - Ability to change the behavior of those whose actions are relevant to the problem.	
Wettestad & Andresen, 1991 (Oslo group)*	3. Effectiveness as Goal Attainment - Achievement of declared goals 4. Scientific congruence - Degree of correspondence between institutional outputs and expert advice	- Number of actors - Agenda scope

Levy, Keohane, & Haas, 1992 (Harvard group)	1. Impact Effectiveness
	- Success in solving the problem that motivated its establishment
	2. Outcome Effectiveness
	- Ability to change the behavior of those whose actions are relevant to the problem
	- 2.1. Specific focus on Process Effectiveness (also referred to as implementation)
		- Agenda setting[A]
		- Bargaining and contracting[A]
		- 2.1 Implementation[A]
		<u>The three C's</u>
		- Increase governmental *concern*
		  - Normative pronouncements
		- Enhance *contractual* environment
		  - Transaction costs reduction
		  - Provision of monitoring and verification mechanisms
		- Heighten national *capacity*
		  - Technical assistance
		  - Aid provision

*Underdal, 1992**	1. Impact Effectiveness & 2. Outcome Effectiveness - Consequences flowing from the implementation of and adjustment to the regime 5. Output Effectiveness - The substantive arrangement of the regime itself	
*Young O. R., 1992**	2. Outcome Effectiveness - Measure of the role of social institutions in shaping or molding behavior in international society	- Transparency - Ease of monitoring or verifying compliance with their principal behavioral prescriptions.

Table 1. Dependent and independent variables from regime effectiveness literature

Authors	1.1) Effectiveness definition	2) Effectiveness drivers

	- 2.1 Focus on Process Effectiveness (also referred to as implementation)
	- 2.2 Focus on compliance
	## 6. Persistence
	- Survival of the regime
		- Robustness
		  - Robustness of the social-choice mechanisms they employ
		## 5. Output effectiveness
		  - "Transformation rules": Stringency of acknowledged rules governing changes in substantive provisions
		- Capacity of governments
		  - Capacity of governments of members to implement their provisions
		- Distribution of power
		  - Asymmetries in the distribution of power (in the material sense) among participants circumscribe the effectiveness of international institutions
		- Interdependence
		  - Level of interdependence among participants
		- Intellectual order
		  - International institutions' effectiveness depends on their intellectual substructures

Andresen & Wettestad, 1994
(Oslo group)*
	1. Impact Effectiveness
	  - Relative environmental or resource improvement caused by the regime
		- Degree of intellectual complexity
		  - Degree of certainty/consensus regarding knowledge of the problem.
		- Political will
		  i) Interdependence
		  ii) Distribution of power
		  iii) Nature of the collective good
		  iv) Degree of political complexity (ie. number of issue dimensions affected)
		  v) Degree of issue linkages
		- Institutional problem-solving capacity
		  i) Provisions of actors who have incentives for constructive problem-solving.
		- Procedural opportunities
		  - Provisions for transcending initial constraints (eg. flexible agenda; physical and technical facilities for efficient work)
		- Mediation capacity
		  - Provision of institutional capacity for integrating/aggregating actor interests and preferences

Table 1. Dependent and independent variables from regime effectiveness literature

Authors	1.1) Effectiveness definition	2) Effectiveness drivers

Young O. R., 1994	**1. Impact Effectiveness**
	- Effectiveness as problem-solving: they operate to solve the problems that motivate parties to create them.
	2. Outcome Effectiveness
	- Behavioral effectiveness: degree to which the operation of a regime causes one or more of its members to alter their behavior.
	2.1 Process Effectiveness
	- Also referred to as implementation (and sometimes used indistinguishably with compliance). Extent to which the regime provisions are implemented in the domestic legal and political systems of the member states & extent to which subjects to a regime actually comply with their requirements.
	3. Effectiveness as Goal Attainment
	- The extent to which a regime's goals are attained over time.
	7. Constitutive Effectiveness
	- The regime formation gives rise to a social practice involving the expenditure of time, energy, and resources on the part of its members.
	8. Evaluative Effectiveness
	- Degree to which the regime produces results that are efficient, equitable, sustainable, or robust.
		<u>Endogenous Variables</u>
		- Decision procedures
		  - Process in place to avoid the pitfalls of paralysis and defection
		- Revenue sources
		  - The extent to which a regime is able to obtain revenue directly
		- Compliance
		  - Ability to secure compliant behavior on the part of regime members. Related to Transparency: the formulation of rules in such a way to facilitate efforts to observe or measure compliance.
		- Robustness
		- Procedural opportunities
		  - Adaptability or flexibility: built in capacity to adjust to changes in the issue area or behavior it is designed to regulate.
		<u>Exogenous Variables</u>
		- Distribution of power
		  - Underlying configuration of power in international society.
		- Interest factors
		  - Configuration of interests among players
		  - Factors relating to the extent to which institutional arrangements offer appropriate solutions to the relevant collective-action problems
		  - The issue concerns the extent to which institutional arrangements are well adapted to the problem at hand
		- Knowledge factors
		  - Regime rests on a common conception of the problem to be solved and some degree of consensus regarding what is needed to fashion a solution.
		<u>Linkage Variables</u>
		- Degree of Complexity
		  - Degree of difficulty or "malignness" of the problem
		- Fit

Table 1. Dependent and independent variables from regime effectiveness literature

Authors	1.1) Effectiveness definition	2) Effectiveness drivers
		- Fit between the character of an international regime and the problem it is intended to solve.
Bernauer, 1995*	1. Impact Effectiveness - Regime solves the environmental problems they are supposed to solve 2. Outcome Effectiveness - Behavioral effectiveness: degree to which the operation of a regime causes one or more of its members to alter their behavior. 8. Evaluative Effectiveness - Regime solves problems in an efficient and equitable manner.	- Decision-making rules - Membership - Access conditions - Compliance system
Levy, Young, & Zürn, 1995*	1. Impact Effectiveness - Regime contributes to solving the problems that motivate actors to create them. 2. Outcome Effectiveness - "Political definition": regimes cause changes in the behavior of actors and in patterns of interactions among them in ways that contribute to management of targeted problems. 2.1 Process Effectiveness - "Legal definition": degree to which conflicts become regulated by the rule of law, and to the extent to which contractual obligations are met. 3. Effectiveness as Goal Attainment - "Policy-oriented definition": policy adjustments that contribute towards goal attainment.	<u>Exogenous Factors</u> - Patterns of Interests - Distribution of Influence - Distribution of Capacity - Nature of the Issue Area - Monitoring Ability <u>Endogenous Factors</u> - Review of Effectiveness drivers by other authors. <u>Linkage variables</u> - Referred to as Behavioral Mechanisms
Zürn, 1998*	1. Impact Effectiveness - The quality of the environment is improved because of the institution 2.1 Process Effectiveness - Degree to which conflicts can be regulated by the rule of law and the extent to which contractual obligations are met. 3. Effectiveness as Goal Attainment - Political effects of institutions (including 2.1 Process effectiveness & 7. Constitutive effectiveness)	
Helm & Sprinz, 1999*	1. Impact Effectiveness	

Table 1. Dependent and independent variables from regime effectiveness literature

Authors	1.1) Effectiveness definition	2) Effectiveness drivers
	- The degree to which international environmental regimes contribute to environmental problem-solving. 2. Outcome Effectiveness - On the national level: regulations and other decisions which have been agreed by the members of the regime. 5. Output Effectiveness - On the institutional level: norms, principles, and rules of the regime itself.	
Young O. R., 1999		- Fit - Congruence or compatibility between the attributes of the relevant institutions and the principal properties of the ecosystems in question. - Interplay - Interaction between institutional arrangements. - Scale - Possibility to scale up or down in the dimensions of space and time on which the institutions operate.

Definitions of the variables as found in the literature appear in gray font.

* Works also focused in tasks 1.2 Determining standard for evaluation and/or 1.3 Developing operational methods to measure effectiveness. See Table 2.

[A] Bernauer (1995) points out that "the place of these variables, or rather concepts, in the analytical framework of the project remains unclear. They appear both as explanations for the success or the failure of environmental protection and as dependent variables that are influenced by institututions and exogenous variables such as power and interests. Hence, it seems that they are regarded both as causes and consequences of international institutions."

Table 2. Standards for evaluation and effectiveness measurement from regime effectiveness literature

Authors	Effectiveness measurement
Wettestad & Andresen, 1991 (Oslo group)	No-regime counterfactual - Improvement in environmental quality over the hypothetical state of affairs in the absence of the institution
Underdal, 1992	Net Effectiveness - Improvement in terms of the net benefits produced (without considering problem 'malignity') No-regime counterfactual - Improvement in environmental quality over the hypothetical state of affairs in the absence of the institution Relative Effectiveness - Improvement in relation to some concept of collective optimum
Young O. R., 1992	No (or different) regime counterfactual - Operation impels actors to behave differently than they would if the institution did not exist or if some other institutional arrangement were put in place.
Andresen & Wettestad, 1994 (Oslo group)	No-regime counterfactual - Relative environmental or resource improvement caused by the regime. Relative Effectiveness - Distance between the state of the environment caused by the actual regulations agreed upon and the "ecological" or "economic" optimum.
Bernauer, 1995	<u>Score of institutional effectiveness</u> 2. Outcome Effectiveness & 3. Effectiveness as Goal Attainment - Difference between actor behavior or the state of the natural environment along dimensions and endpoints defined by institutional goals No-regime counterfactual & 3. Effectiveness as Goal Attainment - Extent to which the existence or operation of the institution contributes, certeris paribus, to variation in goal attainment.
Levy, Young, & Zürn, 1995	No-regime counterfactual - Difference caused by the regime compared with what would have happened if the regime had never existed.
Zürn, 1998	- No regime counterfactual - Causal mechanism tracing - Comparisons
Helm & Sprinz, 1999	<u>Standardized Effectiveness Measurement</u> - No regime counterfactual - Collective optimum - The hypothetical state of affairs that would have come about with a perfect regime

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