Policy relevance of indicators for sustainable development

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Abstract

After a decade of frenzy into developing indicators for sustainable development (ISD) at different institutional levels, it could be time to start assessing what exactly ISD achieved in terms of their usefulness for policy-making. The paper proposes a contribution to identify the determinants for such an assessment of ISD.

Meant originally (Agenda21 - chapter 40) as a means to improve *"information for decision-making"*, assessing sustainable development (SD) with ISD proved a difficult task not the least because of the series of counter-productive principles attached to SD (multi-dimensionality, participation, temporal and geographical scales, uncertainties…). As a response, the many trade-offs inevitably operated during the construction of ISD participated to develop the many different types of applied statistics into tools for decision-making grouped as the generic category of ISD. Such diversity in the translation of goals, objectives, targets and opportunities of ISD are a further difficulty to develop relevant determinants for an assessment of the policy relevance of ISD. Among the proposed criteria for 'institutional usability', applying Clark's (2002) approach based on the users' perception of salience, credibility and legitimacy to ISD, appears to be among the most promising ones. In order to account for the 'open' decision-making context implied by SD, modes of institutionalizing ISD could be seen as a further important determinant to assess, and eventually improve, policy relevance of ISD.

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Introduction

Impossible these days to open a book, listen to a conference, check a website on something 'sustainable' without encountering the word "Indicators". *Googling* the exact match "indicators for sustainable development" revolves 14.700 links[1], the combination "Indicators"AND"sustainable development" revolves some 1.100.000 links, whereas "sustainable development" revolves some 7.260.000 links: nearly every 6th webpage on SD is speaking at least on the margin of indicators. More evidence? The *Compendium of Indicator Initiatives* by the IISD (International Institute for Sustainable Development, Winnipeg, Canada) lists some 597 initiatives[2] from all around the world concerned with the development of indicators.

Indicators seem to be at the heart of the debate on sustainable development whatever the level or stance taken: sectoral issues (e.g. transport&environment; climate change; greening of public procurement…) are claiming to use and develop indicators as well as global, multidimensional issues (e.g. monitoring the Millennium Development Goals). State-of-the-Environment reporting on country level is inextricably linked to the use of indicators, as is the implementation of the "Global Reporting Initiative" on the level of firms. Indicators get developed by some in order to help them define their strategies, whereas the neighbour organisation developed indicators to assess the success of their strategy. Indicators are used to evaluate and communicate on the performance of buildings and construction sites. Indicators are initialized for small-scale evaluations of public space management or the allocation and use of local development funds. Simultaneously, indicators are used to communicate on large scale ex ante Sustainability Impact Assessments. Sustainable indexes are developed to rank stock portfolios and pension funds. Academia is striving to discuss aggregates, which are supposed to replace or complement GDP in the near future, whereas adaptations of the same GDP to integrate environmental and social side-effects are meant to keep the economic aggregate at live…

Since their explicit appearance in chapter 40 of the 1992 Rio Agenda 21 under the heading "information for decision-making", ISD have diversified into a range of products which by now are hardly affiliated anymore to a common understanding. One direct consequence of this diversity is that different applications of ISD are hardly comparable anymore: differences are strong between indicators developed at community level and those developed by international institutions against those indicators developed at firm level. The question could be raised whether this diversity and omnipresence is a sign of the success and strength of ISD or whether it is rather the result of the desperate quest for the real utility and applicability of ISD. In the following, we focus thus solely on ISD in their original understanding: decision-aiding instruments developed to improve policy- and decision-making.

After more than a decade of frenzy into developing indicators at different institutional levels, it could thus be time to start assessing what exactly ISD achieved in terms of their usefulness for policy-making. If the actual usage and the potential usability of ISD in institutional settings are discussed elsewhere (Bauler, 2004), we focus here on the construction of the criteria that might be used to evaluate the relevance of ISD for policy-making. After a synthetic insight into what we consider *"indicators for sustainable development"* for the duration of the paper, we analyse the multitude of objectives indicators are claimed to contribute to and will subsequently focus on policy-aiding. Then we will develop a first typology of ISD according to the different types of assessments they can be used for. Finally we will develop on 3 determinants, which were developed to describe the usefulness of information (i.e. indicators) in policy-making situations. On top of these 3 determinants, we will argue for the necessity to consider a 4th determinant, i.e. the institutionalisation of indicators.

We would like to emphasis that most of the material of this paper stems from a draft version of the author's yet unfinished PhD-thesis. If comments are thus highly welcomed, we however urge the reader to quote the text only after taking the author's permission.

Defining Indicators for sustainable development

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[1] As of 23rd November 2004.
[2] As of 14th April 2004.

There are many different possible approaches to define indicators, and perhaps the best would be to refrain from doing so. Without reference to a clear context or precise policy-situation, it appears that *"attempts to define the characteristics of indicators per se are not helpful"* (Bosch, 2002 : 77). In turn, such desertion from defining the object of our paper not being helpful at all for our enterprise, we analyse in the following some of the more conventional definitions and characterizations of indicators in the context of SD in order to circumscribe the meanings of ISD.

Within our very specific context of ISD, it is OECD which provide us with the most commonly accepted definition[3] of an indicator as *"a parameter, or a value derived from parameters, which points to, provides information about, describes the state of a phenomenon/environment/area, with a significance extending beyond that directly associated with a parameter value"* (OECD 1993, 2002, 2003).

Slightly more subtle and elegantly, Boulanger (2004 : 3) defines an indicator as *"an observable variable used to account for an unobservable reality"*. And Boulanger to add a general definition of social indicators given by Bauer et al. (1966 : 1 *in* Boulanger 2004 : 3): *"statistics, statistical series, and all other forms of evidence that enable us to assess where we stand and are going with respect to our values and goals"*.

Many authors inspired themselves from the OECD definition and from the working parties initiated at OECD level. Adriaanse (1993) developed in the context of environmental policy performance reviews for the Netherlands a widely used definition which appears to have direct filiation to OECD: *"an indicator is supposed to make a certain phenomenon perceptible that is not - or at least not immediately - detectable. This means that an indicator has a significance extending beyond that [which] is directly obtained from observation. (...) Indicators generally simplify in order to make complex phenomena quantifiable in such a manner that communication is either enabled or promoted."*

Adriaanse inserted an argument which calls to sustain further procedural interest into indicators: they are meant to trigger communication among actors. Building on Adriaanse's procedural understanding, Rotmans et al. (1997), quoted by his research associates (Greeuw et al. 2001), developed Adriaanse's definition into: *"Indicators describe complex phenomena in a (quasi-) quantitative way by simplifying them in such a way that communication is possible with specific user groups."* And to add that *"the term 'quasi' indicates that, although indicators are mostly quantitative in nature, in principle they can also be qualitative. Qualitative indicators may be preferable to quantitative indicators where the underlying quantitative information is not available, or the subject of interest is not inherently quantifiable."*

Interestingly, if we step outside of the purely environmental indicator sphere, for instance by simply having a look at other OECD departments, the emphasis on what provides identity to an indicator slightly shifts. As one example among many possible, the OECD's glossary on evaluation (OECD, 2002b) defines an indicator as a *"quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect the changes connected to an intervention, or to help assess the performance of a development actor."* This definition is thus much more focused on policy performance: indicators are assessment tools which relate directly to policy. This understanding of the links between policy evaluation and indicators has found adherence also within the relatively small and emerging community of researchers active in the field of evaluation for sustainable development. The EASY-ECO[4] (2002) research network issued a working definition for indicators, which they acknowledge as *"a signal that reveals progress (or lack thereof) towards objectives; means of measuring what actually happens against what has been planned in terms of quantity, quality and timeliness."*

Obviously many other indicator definitions exist. Based on a generalized and nuanced understanding of ISD, we use for the purpose of this paper the following working definition[5] for indicators: *"Indicators for sustainable development provide an interpretation of the evolutions of stocks and/or flows in order to account for the human-environment interactions. Simplifying the complexity of reality, indicators are meant to participate to the self-generation of sustainable development by enhancing communication. Defined by*

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[3] We give here the current version of OECD's definition of an indicator. Through the years, the wording of that definition was slightly adapted to policy-discourse. Essentially however, the definition remained constant over the last decade.

[4] *Evaluation for Sustainability* research network: http://www.sustainability.at/easy.

[5] This working definition is partly based on a definition developed earlier to which we contributed. See Zaccaï, Bauler (forthcoming).

technical, methodological and scientific conventions, the definition, selection and interpretation of indicators imply an articulation of scientific and societal values at various levels and depths."

Multiple objectives, multiple usages

Many elements of this definition raise questions and could be commented upon (Bauler, 2004). At this point, we are solely interested in the many different objectives and usages indicators can contribute to. We are focusing for the current exercise on the 'self-generation of SD' within the political and institutional (administrative) sphere.

The initiators of the ISD debate at the international level had a very precise idea of the linkage between ISD and SD, namely "(…) indicators of sustainable development need to be developed to provide solid bases for decision-making at all levels and to contribute to a self-regulating sustainability of integrated environment and development systems." (§ 40.4) (UNCED, 1992). In other words, evaluation tools (such as ISD) - by the fact that they evaluate actions, simplify information and communicate results - are meant to trigger infallibly a series of policy responses which will eventually be steps on the SD-pathway. In reality of course, triggering positive public action is way more complicated than just communicating information, and presents many indeterminacies (see for instance, Chermack 2004). On the other hand, it is obvious too that our understanding of such complex and heterogeneous processes as the triggering of public policy is far from sufficient to discourage an understanding of the relationship ISD-SD as being somehow self-generating, self-supporting and sometimes even self-fulfilling. Lehtonen (2003) articulated the potentially occurring indirect influence of indicators in the same sense: *"The wider use of evaluations and the development of indicators can be seen as instruments enhancing the reflexivity of modernization (Giddens 1990) and deliberative democracy through inclusive, participatory decision-making, which should ultimately contribute to sustainability through what has been called social learning (Van der Knaap 1995)".*

Exploring the policy-relevance of indicators in terms of their usage for policy-makers is thus far from straightforward. Among the many informational levers indicators could participate to, the following usages have for instance been identified by Aal et al. (2002 : p.32):

- *Indicators for the clarification of developmental trends : trend analysis;*
- *Indicators for comparing one's own performance with other municipalities nationally or internationally : benchmarking;*
- *Indicators. for reporting upwards in a decision-making hierarchy : reporting;*
- *Indicators for clarifying the impacts of planned initiatives and actions : impact assessment;*
- *Indicators for registering and evaluating the effects of executed initiatives and actions : evaluation;*
- *Indicators for registering and monitoring the development of a condition, e.g. state-of-the-environment : environmental control.*

This typology of indicator usages can be complemented with a view on the different types of indicators and their respective normative advantages and limits (see table below). However if one aims to explore the usability, e.g. policy-relevance, of ISD beyond such normative statements, it appears invariably that it is the adequacy between purpose on the one hand, and the type of indicator on the other hand, which determines the strength of the different approaches.

Criteria to assess the impact of information / indicators

Clark (2002 : 6) states that *"even influential assessments rarely impact policy choices directly, but rather exert substantial indirect influence on long term issue development"*. However, if we want to understand further the relationship between indicators and policy-making, it becomes necessary to specify the influence of information on policy-making a little further than simply with 'enlightenment', 'collaborative learning', 'social learning', 'enhancing reflexivity of modernization', 'contributing to discursive democracy' or as we stated 'participate to the self-generation of SD'. It becomes thus necessary to construct a link between the generally accepted indirect impact of information on decision-making and the characteristics of the information.

Approach	Type of indicator	Description and relation to assessment	Strengths and weaknesses
Functional approach	Descriptive indicators	Assessment of the prevalent existing situation	(+) permits to identify indicators according to their purpose in an evaluation exercise.
	Prescriptive indictors	Assessment of progress achieved with regard to desired outcome	(-) often difficult to distinguish clearly between the 3 types of indicators and to identify a given indicator as belonging to one or the other type.
	Normative indicators	Assessment of evolution of phenomena with regard to defined limits or norms	
Policy-performance approach	Effectiveness indicators	Assessment of the impacts (i.e. the effects) of a policy or of a change in the conditions addressed by policy	(+) allows to consider the quality of efforts made and of the obtained change, rather than to limit assessment to quantity of change induced.
	Efficiency indicators	Assessment of the performance of resources (human, economic or environmental) allocated to support a change in a given system	(-) notable influence of the selection of the evaluation's timeframe on the assessment's verdict.
	Outcome indicators	Assessment of the means liberated by the policy decision meant to cope with the problems identified	(-) increasingly difficult to identify unambiguously the effects of single policy-measures.
Systems approach	Input indicators	Assessment of the flow of material or energy or substances entering a system (e.g. a nation, a city, an industrial sector). Measured in absolute or relative values.	(+) clear relationship to a logical and hierarchical framework of interdependent systems.
	Output indicators	Assessment of the flows leaving a system.	(-) large influence of the definition of the systems' boundaries, the division of systems into subsystems and the hierarchy between systems.
	Throughput indicators	Assessment of the flows passing through a system without notably altering the system's quality.	(-) ignoring the evolution of the quality of the considered system, i.e. black-box.
Economic approach	Capital or Stock indicators	Assessment of the quantity or quality of resources (human, natural, infrastructural, knowledge…).	(+) allows to increase transparency of trade-offs (i.e. substitutions) between different capitals. (+) permits to follow the effects of policy-measures. (-) dependant on the formalization of a comprehensive model of different types of capitals.
	Rates or Flow indicators	Assessment of the extent, speed or quality of change of given resource capitals.	(-) calls for agreement on valuation of the quality and quantity of all types of capitals (including human, environmental, social, cultural…). (-) calls for the agreement on rules of substitution between capitals.
Process-oriented approach	Guide-beam indicators; Distance-to-target indicators	Assessment of evolutions with regard to desired outcome. Scientific, societal or political norms define a corridor of desired evolutions, or the value of the target situation.	(+) calls upon actors to become explicit about their targets, needs/wants and norms. Development of scenarios, or of limits and thresholds, allow for greater transparency on policy (+) allows for easy communication of the steps (to be) achieved and directions (to be) followed.
	Non-sustainability indicators	Assessment of evolutions with regard to an initial non-desired situation.	(-) dependant on the strength, accuracy, robustness of the process of identifying the targets and the thresholds.
	Capacity building or institutional or human capital indicators	Assessment of the capabilities developed by a society (or institution) and their adaptability to stress, change, crisis.	

As a starting point, we acknowledge that indicators are influencing *agenda setting*, i.e. shape debate, rather than defining outcome. In other words, influence of information on agendas, as it is assumed to be the case with indicators, can be apprehended as a way of enhancing an *"issue domain"*, i.e. *"a group of people and/or organizations interacting regularly over periods of a decade or more (…) within a given policy area"* (Sabatier et al. 1999 : 135). For such an issue domain to emerge and develop, a series of conditions is to be met such as: shared interest among a group of actors, long-term existence of such interest and action, institutionalisation of the interactions and hence of information exchange. The issue domain "sustainable

development" profits thus from the existence and stability of commonly agreed indicators which are contributing to the issue domain's emergence and stability with the development of a common 'data language' or the standardization of basic and periodic reporting. As said before, the dynamic of indicators' impact is far from being simplistic, and the influence of information on such rich social processes as SD is everything but simple. However, since Rio and the subsequent developments of Local Agendas with their indicator batteries, some sort of sustainable fairy tail emerged which Bell and Morse (1999 : xiii) caricatured with: *"(…) the tacit and somewhat naïve assumption (…) that sustainability is 'good' and all want it. Hence by association, Sustainability Indicators are 'good' and people will eventually learn to want, love and trust them. It all becomes a matter of faith".*

Obviously, it is not exclusively the input of information which influences issue domains: more trivial conditions can have a strong impact on the emergence and persistence of the issue domain, among which are budgetary cuts, departure of the main 'animator', human failure and incapacity, power games… Besides, institutions with their finite resources have to operate trade-offs between the issue domains they want and can support: competition between issue domains, especially the emerging ones, is thus everyday reality. A typical example on the European level is the struggle between the Lisbon and Gothenburg processes, or between the issue domain of "social cohesion" and "sustainable development". Without denying the importance of regime-internal mechanisms (linked to budget, capacities…), we will continue to concentrate in the following paragraphs on the linkages between the construction or existence of *information* and the success of *issue domains*: which characteristics does information need to develop in order to be relevant for the creation and development of an issue domain?

In this respect, Clark et al. (2002), on which Parris and Kates (2003) and many others[6] leaned (e.g. Eckley 2001), pointed to an interesting 3points-framework, which we will largely follow hereafter: *"The most influential assessments are those that are simultaneously perceived by a broad array of actors to possess 3 attributes: salience, credibility and legitimacy".* (Clark et al. 2002 : 7)

The first point to be raised is that it is on the level of the actors' *perception* of the assessment that influence is determined. We can thus reaffirm what we mentioned before, namely: not the intrinsic, objective quality of information (if ever this could be evaluated thoroughly) plays a major role in generating impact on decisions, but rather the individual's subjective judgement of the information's quality. Because of this subjectivity, decision-makers will attach attention both to the information product and the construction process (i.e. evaluation process; indicator development process). Secondly, issue domains are societal collective phenomena, and thus the influence of the assessment on the *societal* development of the issue domain is effective only when a sufficiently large number of decision-makers share the same subjective appreciation of the same information.

Salience is relative to the correspondence of the actors' *perception of the stakes addressed in the evaluation* with regard to what they perceive as being their stakes. Does the assessment refer to the questions deemed relevant by the decision-maker? Again it should be noted that it is not the objective quality of the system closure or of the boundary setting; neither is it the quality of the systemic decomposition of reality into systems or subsystems; neither is it the deductive capacity of the evaluator to single out pertinent and significant questions. Rather is it the comprehension by the evaluators of the decision-makers understanding of the issue under evaluation.

Implicitly, a second condition emerges which codetermines salience: effective communication of the stakes addressed by the assessment. Relevant information can be gathered from many places and from many actors. In most decision-making situations, salient information could be gathered from many sources. Fierce competition has thus entered since long the information market, and it is that information that is effectively communicating about having taken into account the stakes of the main decision-makers, which will eventually make a difference. This confirms also the late success of evaluation methodologies, which rely on techniques which allowing the evaluators to gather in-depth knowledge of the perception of the decision-makers' stakes. For instance, the collaborative drafting of the IPCC's reports' executive summaries by decision-makers and scientists is proactively promoting salience of the reports.

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[6] The initial set of attributes of success/failure of assessments stems from the "Global Environmental Assessment"-Project : www.environment.harvard.edu/gea.

Credibility reflects, after Clark et al. (2002 : 7), *"whether an actor perceives the assessment's arguments to meet standards of scientific plausibility and technical adequacy"*. Again it is assumed that decision-makers do not explicitly and methodologically assess the quality of the scientific arguments and rationales, which underlie the construction of the information. Such an enterprise, apart from being time-consuming and resource-intensive, would in most cases exceed their capacities in comprehending scientific processes. Instead, as they have to trust in the quality control mechanisms of Science, they rather judge whether the process of information construction sufficiently used truthfully and thoroughly such scientific mechanisms of quality assurance (e.g. does the evaluator expose his findings to peer-review?). Of course, decision-makers don't judge these processes, and the information they gathered, in *absolute* terms. Rather do they *compare* the credibility of assessments that they have access to: there exists thus competition between different sources of information also on the level of their respective credibility. In most issues, scientific credibility is just as difficult to evaluate as truthfulness: for the lay-man it is intrinsically difficult to perceive if scientific quality control was effective or not. Often, such an enterprise can only be successfully realized with considerable and long-term knowledge of the scientific discipline. When it comes to multi-disciplinary assessments, such a credibility-check on the level of the information itself is thus hardly possible anymore: credibility is then evaluated "by proxy" (Clark et al. 2002 : 23). A proxy for credibility is for instance the recognition of the evaluator's expertise (or even the evaluator's institution's expertise) by other decision-making bodies. Credibility is also correlated to the amount of consensus on the issue under scrutiny. In issues of high uncertainty and complexity, sufficient credibility is often difficult to reach as opposing views and contradictory voices diminish the decision-makers ability to assign credibility to any of the evaluations.

The third attribute, *legitimacy*, is the more procedural and societal one. An assessment gains legitimacy if the decision-maker, stakeholder and the evaluator perceive that the evaluation has been elaborated with sufficient procedural fairness to political or societal standards. Legitimacy does thus not only depend on the perception of the decision-maker, but the evaluator has equally to perceive the process as being fair and meeting acceptable standards. Clark et al. (2002 : 25) point out that *"even assessments that make recommendations that run counter to a participant's interest may be accepted as legitimate if that participant believes his concerns were considered, even if rejected"*. Of course, procedural legitimacy is difficult to evaluate once the information being on the desk of the decision-makers. Legitimacy enhances more virulently than the other 2 attributes the calls for the communication of meta-information on the assessments *process*. However, even in the presence of such meta-information and an enhanced transparency of the process, the intrinsic legitimacy of processes is very difficultly assessed. As with credibility, actors use mostly proxies to develop their judgment on the legitimacy of the assessment: who participated? Were representatives of the decision-makers stakes integrated in the evaluation process?…

Proposal for a fourth criterion: institutional embeddedness as overarching condition for policy-relevance?

It appears from the above-mentioned 3 criteria that the general organisational setting and the 'project conditions' from which indicators are stemming have a major influence on the policy-relevance of indicators. This is far from being exclusively applicable to governmental initiatives as can be illustrated with the partnerships, which private firms are currently building with academic experts and, to an even stronger degree, with civil society (NGOs) to construct the corporations' Triple-bottom-line reports. In their quest for accountability, private corporations understood the importance of organisational and procedural issues. In the case of private corporations, the procedural arrangements develop mainly on different types of partnerships.

In our case, as we restrict our analysis to governmental, non-local initiatives of indicator development, procedural arrangements are very much determined by the institutional embedding of the indicator exercise. The overarching importance for SD of the broader institutional setting has been stated repetitively in a number of contexts (e.g. Petit, 1997; Pfahl, 2004). Subsequently the importance to assess the institutional setting as one elementary precondition (e.g. in terms of capacity-building for SD) or pillar of SD (i.e. institutional sustainability) has been acknowledged by some with attempts to translate institutional performance into indicators (Spangenberg et al., 2000).

However what we stress here is that the general institutional embedding of indicator initiatives (including their authors) could influence indirectly the success or failure of indicator initiatives, as the institutional

embedding reveals itself as an indirect but major parameter steering the above mentioned criteria regarding the influence of information on policy-making. As seen above legitimacy, credibility and salience are linked to the organisational and procedural features of the information exercise. These features can be acknowledged as 'institutional embeddedness', which can be translated into 2 distinct levels :

- Institutional embeddedness of the project relates to the organisational and procedural aspects of the indicator initiative. Project level institutional embeddedness links to questions related to the procedural sequencing and timing of the initiative, interaction with adjacent evaluation or monitoring initiatives, participatory and governance issues…

- Institutional embeddedness of the actors/authors relates to the institutional capacity and capability of the actors/authors of the indicator initiative to link efficiently to the 'official' SD-process, i.e. the extent actors/authors are participating to other elements of the SD-process (e.g. SD-strategy definition, agenda-setting…). Institutional embeddedness of actors/authors could thus be assessed in terms of past and ongoing experience and expertise with regard to SD.

Institutional embeddedness could thus be defined as a precondition to legitimacy, credibility and salience, which in turn were identified as preconditions, which need to be met when trying to enhance the influence of information on policy-making.

How far it will be possible, for a particular indicator initiative, to evaluate an initiative's capacity to meet these 2 levels of preconditions, and if any 'thresholds' for policy-relevance of information can be observed, will be developed elsewhere. Obviously the perspectives developed above need to be translated further into practical value-added for indicator initiatives, one of which would be the existence of a series of thresholds or minimal standards for the policy-relevance of indicator initiatives.

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