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# Towards a dashboard of sustainability indicators for Panama: A participatory approach

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ABSTRACT

The importance of pursuing sustainable modes of development has received increased global recognition in recent years. Since the issue was first addressed in the United Nations' 1987 Brundtland Report, many countries have developed their own sustainability strategies. In Panama, a UNESCO Chair entitled *Dialogues on Sustainability* was created in 2011 by four scholarly institutions with the objective of advancing a sustainability agenda through education, research and discussion. In line with conclusions from the United Nations' Agenda 21 action plan, the UNESCO Chair identified the creation of a set of national sustainability indicators as an important step toward this goal. This paper presents the work done by the Chair to develop a dashboard of national sustainability indicators for Panama. Indicators were selected using participatory methods, involving 42 individuals representing 16 different government agencies, NGOs, academic institutions, and private entities from Panama. Adhering to a three-pillar structure, the resulting dashboard of 20 indicators is shown to be a useful tool for understanding past trends, present issues, and future trajectories within Panama's economic, environmental, and social spheres. As a further demonstration of the dashboard's utility, this paper focuses on three example issues shown by the dashboard to be important: security, vehicles and vehicle emissions, and natural disasters. This paper also juxtaposes the Human Development Index and Ecological Footprint to compare Panama with other Latin American countries.



## 1. Introduction

In the face of growing environmental change and awareness, increasing international attention has been paid to modes of development that are sustainable over time and space. The United Nations' (UN) Brundtland Report spearheaded contemporary discussions of sustainability by calling for "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987). Indeed, the UN's action plan Agenda 21, produced during the 1992 Earth Summit and built off of the Brundtland Report, identified the establishment of a green economy and sustainable development as urgent international priorities (UN, 1992; Spangenberg et al., 2002). The importance of sustainability was reaffirmed at the Rio + 20 conference in 2012 and is central to the post-2015 Sustainable Development Goals agenda (UN General Assembly, 2015).

Finding ways to measure sustainability was identified in Agenda 21 as one of the principal objectives for nations (UN, 1992). Yet, over twenty years later, how best to measure progress towards sustainability remains a subject of debate. One approach is to use composite indices (Nardo et al., 2005). The composite index utilizes multiple indicators as input and produces a single, aggregated value as output (Nardo et al., 2005). For instance, the Ecological Footprint (EF), which measures the amount of biologically productive land required to sustain a given population's consumption patterns, is an index of environmental sustainability (Ewing et al., 2010). Composite indices have numerous advantages: they allow for summarizing multi-dimensional realities, are easy to grasp conceptually, and, consequently, tend to be effective for communicating with the general public (Nardo et al., 2005). However, aggregating indicators inevitably results in a loss of information and introduces subjectivity through relative weighting of the index's components (Reed et al., 2006). Moreover, composite indices lend themselves to a weak sustainability paradigm, whereby decline in one sector can be compensated by growth in another, as aggregation necessarily allows for degrees of substitutability and compensability (Stiglitz et al., 2009). Such substitutions have been criticized for i) the uncertainty that substitution is truly possible, ii) the irreversibility of

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some forms of environmental damage, and iii) the necessity to maintain most natural resources above critical levels to support life and maintain environmental resilience (Ekins et al., 2003; Stiglitz et al., 2009).

Related to composite indices are methods that alter national accounts to incorporate elements relevant to sustainability. Efforts to "green" the Gross Domestic Product (GDP) are an example of this, whereby deductions are introduced to a country's GDP to account for damage to or depletion of natural resources (Stiglitz et al., 2009). These methods are similar to composite indices in that they produce a single aggregated output value, in this case monetary. These methods face many challenges, however, notably assigning costs to environmental degradation, which can be difficult to quantify (Heal, 2012). Furthermore, the use of aggregation in these methods means they too are inherently weak sustainability measures.

Another approach is to present a certain number of indicators in a set order, known as a dashboard of indicators. The advantage of this method is that specificity and precision are retained. Further, by keeping indicators separate and non-aggregated, this method lends itself more easily to a strong sustainability policy (Stiglitz et al., 2009). However, this gain comes at the cost of ease of use. Dashboards can appear to deliver a lot of information at once, and can seem heterogeneous and un-harmonized, which may complicate interpretation (Stiglitz et al., 2009). To prevent this, indicators can be grouped according to different schemes, such as common themes or policy objectives.

Methods for choosing sustainability indicators are equally diverse (see Bell and Morse, 2003). Recent years have seen a growing focus on participatory methods applied to indicator selection in many countries (eg. Maxim, 2012). Participatory methods seek to bring the stakeholders – those whom the indicators are supposed to serve – into the indicator selection process. This "bottom-up" approach aims to balance what has traditionally been a "top-down", expert-led process (Reed et al., 2006). Top-down, expert-led approaches have the advantage of benefitting from greater technical knowledge; however, in failing to involve a wider community of stakeholders, they lose a potentially important source of knowledge of the local context (Reed et al., 2006). Additionally, failing to involve stakeholders may result in the indicators lacking legitimacy in the eyes of the stakeholders (Chamaret et al., 2007), potentially compromising the adoption of the indicators. In order to balance the strengths and weaknesses of each method, some participatory efforts have sought to incorporate elements of both expert-led and stakeholder-led approaches to indicator selection (Chamaret et al., 2007).

Despite this diversity in methods, many countries have adopted similar approaches when developing sustainability indicators. Following an investigation of 34 such initiatives, spanning 19 countries, Côté and McCollough (2007) identified numerous common elements between efforts. First, most initiatives used advisory and participatory methods to facilitate cooperation and discussion of sustainability indicators, while prioritizing broad consultation of various stakeholder groups and consensus. Second, many institutions favored using fewer indicators to combat information overload and facilitate comprehension. Third, there was a strong preference for selecting indicators that use previously existing data over compiling a list of 'ideal' indicators and then pushing for data collection. Fourth, most initiatives categorized their sustainability indicators by domain or by "pillar". The term "pillar" refers to one of three dimensions – economic, environmental, and social sustainability – that, together, are commonly held to be the foundation of sustainable development.

The present paper presents work done in Panama to develop a dashboard of sustainability indicators that could assist in understanding the rapid changes occurring in the country. Indeed, Panama is currently experiencing a period of rapid economic growth: according to World Bank estimates, Panama's GDP grew by nearly 11% in 2011 and 2012, and by 8.5% in 2013, which was the second highest increase in Latin America for that year (http://data.worldbank.org/country/panama). The question of interest is whether this high economic growth is bringing social and environmental benefits – thus advancing the sustainability agenda – or whether it fosters social inequality and environmental degradation. The dashboard of sustainability indicators was developed using participatory methods, taking elements from both top-down and bottom-up strategies.

## 2. Methods

### 2.1. Institutional context

A UNESCO Chair entitled *Dialogues on Sustainability* was created in 2011 in Panama by four scholarly institutions: McGill University, the Smithsonian Tropical Research Institute (STRI, located in Panama), the Institute of Scientific Investigations and Services of High Technology (INDICASAT), and the Catholic University Santa María la Antigua (USMA), with C.P. being the Chair Holder. An inaugural meeting on August 3rd 2012 in Panama City was attended by seventy-one participants from varying sectors: private, NGO, government, indigenous, and academic. Attendees emphasized the need for providing "continuity and stability to existing efforts to ensure the sustainability of socio-ecosystems, and to create a space for dialogue about research topics on sustainability and generate constructive ideas and proposals based on rigorous analysis" (Foro y Observatorio de Sostenibilidad, 2012). With this mission, the UNESCO Chair created a Forum and Observatory for Sustainability (henceforth FOS; http://usmapanama.com/foroyobservatoriodesostenibilidad/es). One of the priorities identified during the inaugural meeting was the development of a national dashboard of sustainability indicators. These indicators would need to be implementable immediately and should track changes in real time. The FOS designated the authors of this study to organize and conduct the dashboard development process.

To accomplish this objective we used the "focus-group technique", which seeks to "stimulate dialogue between participants in a small group on a specific theme, encouraged by a moderator" (Chamaret et al., 2007). The purpose of the focus group was to carry out the indicator selection process. A maximum diversity in stakeholder participation was sought out for the focus group. Consequently, the number of participants was kept large enough to include a diversity of perspectives but small enough to ensure the group remained functional and direct. Invitations to join the focus group were extended to relevant government agencies and NGOs that worked with indicators as part of their occupation. Thus the focus group constituted the top-down, expert-led element in our top-down/bottom-up participatory approach.

The work of the focus group was complemented and validated by a workshop to capture a larger sample of perspectives, opinions, and interests, which constituted the bottom-up, stakeholder-led element. Persons invited to participate in the workshop were selected among researchers, managers, and representatives of projects pertaining to sustainability, although not necessarily to indicators. All invited persons were identified from STRI contacts and from participants of the August 2012 FOS meeting. Invitations were sent by e-mail. We invited 94 persons – representing 14 governmental agencies, 13 NGOs, 4 academic institutions, and 3 private entities – to participate in the workshop, of which 32 ultimately participated (Table 1). Of the 94 persons invited to participate in the workshop, 22 were also invited to participate in the focus group. Of these 22, 20 participated in at least one focus group meeting. In total, 42 persons participated in the focus group and/or