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Thematic Focus: Environmental Governance

The Need for Numbers—Goals, Targets and Indicators for the Environment



In the run-up to the June 2012 United Nations Conference on Sustainable Development in Rio de Janeiro (Rio+20), it has become increasingly clear that we need to put "sustainable development" into practice by setting time bound, measurable goals and targets and monitor progress towards achieving them.

Why is this issue important?

Although the term "sustainable development" has existed for decades, it is difficult to assess our progress towards attaining it. At the same time decision-makers need clear targets and reliable data to track changes. Gross Domestic Product (GDP), the Human Development Index (HDI) and the set of Millennium Development Goals (MDGs) and related indicators predominantly try to measure its economic and social aspects, and a number of initiatives aim to track specific aspects of environmental change (i.e. the third pillar of sustainable development). But there is no comprehensive set of goals or targets for "the future we want" (UN 2012b), nor adequate monitoring of progress towards enduring human and environmental well-being.

Existing goals, targets and indicators for environmental and overall sustainability

Twenty-five years ago, the 1987 World Commission on Environment and Development had already proposed to develop new ways to assess progress towards sustainable development. This was echoed in subsequent international summits and agreements on sustainable development, including the first Rio Summit in 1992, the Johannesburg Plan of Implementation in 2002 and the UN Commission on Sustainable Development (CSD). Since then, other efforts have proposed broad development goals as well as specific targets for environmental improvement.

The Millennium Development Goals (MDGs) is the leading attempt to define specific development goals and targets for developing regions. Goal 7, oriented to ensuring environmental sustainability

(Box 1), is one of the eight global goals and related quantitative indicators to track progress. A few other international environmental accords include targets, focusing on specific aspects such as climate change and biodiversity. In addition, UNEP and the Swiss government developed the Global Environment Goals initiative (UNEP 2010) and the fifth Global Environment Outlook (GEO-5) analyzes gaps in, and progress towards, meeting these (largely qualitative) goals while identifying policies that can speed up achieving them (UNEP 2012b). Table 1 provides an overview of the relatively few existing numerically-based environmental goals and targets.

There are a number of interesting initiatives to measure the broader spectrum of sustainable development that include assessments of its environmental dimensions. All these efforts have their strengths and weaknesses. Table 2 presents an overview of selected composite indicators and their characteristics.

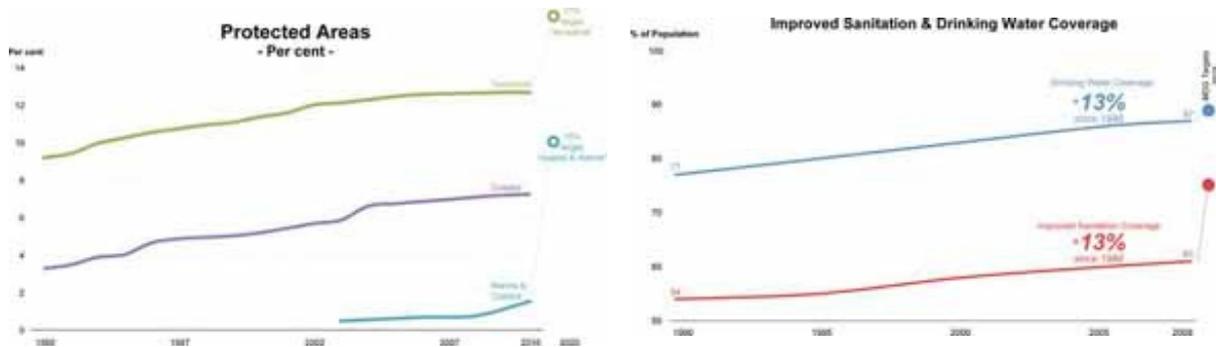
Currently, however, there is no coherent set of quantified goals, targets and indicators that unfold and measure progress toward environmental sustainability or sustainable development in general. For any goal or agreement to be effective, it is important to set out clear numerical targets and the mechanisms to monitor and review them using robust time series data sets. The Montreal Protocol on Substances that Deplete the Ozone Layer, which includes specific targets and is one of the very few successful international environmental agreements, clearly demonstrates this.

Box 1. MDGs, Goal 7: Ensure environmental sustainability	
Targets	Indicators
Target 7.A: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources	7.1 Proportion of land area covered by forest 7.2 CO ₂ emissions, total, per capita and per \$1 GDP (PPP) 7.3 Consumption of ozone-depleting substances 7.4 Proportion of fish stocks within safe biological limits 7.5 Proportion of total water resources used
Target 7.B: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss	7.6 Proportion of terrestrial and marine areas protected 7.7 Proportion of species threatened with extinction
Target 7.C: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation	7.8 Proportion of population using an improved drinking water source 7.9 Proportion of population using an improved sanitation facility
Target 7.D: By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers	7.10 Proportion of urban population living in slums

Source: UN 2011a

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In addition to clear goals and targets, solid quantitative indicators showing trends over time are needed to track progress towards stated objectives. Indicators and composite indices illustrate and communicate complex data and trends in a simplified form and can help shape policy based on transparent information. While good indicator sets, or aggregated indices, exist on paper, data are often lacking to populate them, especially for developing countries and regions. At the global level, however, data exist for key indicators to provide an overview of environmental change, available in reports such as *"Keeping Track of Our Changing Environment"* (UNEP 2011a) and the UNEP Yearbook (UNEP 2012a).



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Indicator charts from *"Keeping Track of Our Changing Environment"* to relay the information about the environmental changes at global level. Source: UNEP 2011a

Looking Ahead: Sustainable Development Goals, including Indicators

The Rio+20 Summit offers a new opportunity to address sustainable development issues. The Conference proposes to devise an agreed set of Sustainable Development Goals (SDGs) and targets, including indicators to monitor progress (UNCSD 2011). In the words of the UN Secretary-General Ban Ki-Moon, "Let us develop a new generation of sustainable development goals to pick up where the MDGs leave off. Let us agree on the means to achieve them" (UN 2011b). Inspired by Agenda 21, critical themes and issues that would move the sustainable development agenda forward need to be prioritized, including the following:

- Combating Poverty
- Changing Consumption Patterns
- Promoting Sustainable Human Settlement Development
- Conserving Biodiversity and Forests
- Protecting the Oceans
- Saving Water Resources
- Advancing Food Security
- Promoting Energy production, including from renewable sources.

Most of these issues are strongly linked to the environment, enabling targets to be firmly rooted in the Earth's biophysical properties. They should also be geographically scaled because environmental limits differ from the local through to global levels. Nevertheless, it is ever more evident that the environmental limits to development are at the planetary level and we now urgently need a comprehensive and solid set of quantified goals, targets and indicators.

Recently, the United Nations Secretary-General's High-level Panel on Global Sustainability (UN 2012c) called for a sustainable development index or set of indicators to be developed and stipulated that the SDG framework:

- Be universal in character, covering challenges to all countries rather than just developing nations;
- Express a broadly agreed global strategy for sustainable development;
- Incorporate a range of key areas that were not fully covered in the MDGs, such as food

security, water, energy, green jobs, decent work and social inclusion, sustainable consumption and production, sustainable cities, climate change, biodiversity and oceans, as well as disaster risk reduction and resilience;

- Be comprehensive, reflecting equally the economic, social and environmental dimensions of sustainable development and the interconnections between them;
- Incorporate near-term benchmarks while being long-term in scope, looking ahead to a deadline of perhaps 2030;
- Engage all stakeholders in implementing and mobilizing resources, including local communities, civil society, the private sector and Governments;
- Include progress metrics alongside absolute targets, to focus policy attention as a means of driving development outcomes and to reflect various development priorities and conditions across countries and regions; and
- Provide scope to review these goals in view of evolving scientific evidence.

Governments will need to agree to develop a set of key universal, sustainable development goals, covering all three sustainable development pillars and their interconnections. Such goals should galvanize individual and collective action and complement the MDGs, while allowing for a post-2015 framework. At the same time, public and private entities need to scale up efforts to transparently collect, compile, assess and disclose relevant data and information to track progress toward such goals.

Table 1. Currently quantified environmental goals and targets			
Themes	Goals	Targets	Reference
Atmosphere			
Climate change	Prevent anthropogenic climate change	Keep atmospheric GHG concentration below 380 ppm CO ₂ equivalent to avoid temperature increase above 2°C	UNFCCC (2010) Copenhagen Accord
Land			
Natural habitats	Reduce direct pressures on biodiversity	By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced	CBD (2010) Aichi Biodiversity Targets
Biodiversity			
Protected areas	Improve the status of biodiversity	Protect 17% of terrestrial and inland water areas and 10% of coastal and marine areas by 2020	CBD (2010) Aichi Biodiversity Targets
Human Wellbeing			
Water and sanitation	Access to safe drinking water and improved sanitation for all	Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation	MDG 7

Source: UNEP 2011a, UNEP 2012b

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Various efforts have been made to create aggregate, composite and country-wide indices on environmental trends and sustainable development, leading to indices such as the Environmental Performance Index, Environmental Sustainability Index, Ecological Footprint, Genuine Savings concept, and the set of Indicators of Sustainable Development. However, none of them has received the same level of credibility and popularity as UNDP's Human Development Index (HDI) (see also Table 2). Underlying methodologies on environmental accounting, such as UNSD's System of Environmental-Economic Accounts (SEEA), are also being developed and promoted, but implementation is limited and mainly confined to certain developed countries due to its complexity and to data gaps. Generally speaking, the lack of a clear and simple measurable methodology, such as the ones used for the HDI and the MDGs, coupled with a lack of robust data at country levels, often hampers the development of credible, world-encompassing composite indices for the environment.

Table 2. Overview of composite indicators of environmental sustainability								
Index	Origin	Measured component	Indicators	Geographic coverage	Periodicity (year of origin/last year of publication/ frequency of calculation)	Time coverage	Key strengths	Key weaknesses
Better Life Index	OECD	Well-being	<ul style="list-style-type: none"> • Material living conditions: income, wealth, housing • Quality of life: health, work-life balance, education, social engagement and relations, environmental quality, security, subjective well-being • Sustainability: natural, economic, human, social capital 	OECD region (34 countries; BRICS to be included in future)	2011/2011/ plan is to update Index regularly with aim of trend assessment (frequency is presently unknown)	2009	<ul style="list-style-type: none"> • Potential media attention • Visualizing and comparing key well-being factors • Essential components of well-being relevant for many countries captured • Potential trend analysis 	<ul style="list-style-type: none"> • Data mostly come from official sources (OECD or National Accounts, UN Statistics, NSO) • Very complex index • Calculated only for developed countries • Index doesn't account for inequalities among people in a country (evaluates condition for an average individual or household)
Living Planet Index	WWF in cooperation with Zoological Society of London and Global Footprint Network	State of the world's biodiversity, ecosystem health	<ul style="list-style-type: none"> • Based on trends in about 5 000 populations of nearly 1 500 terrestrial, marine and freshwater vertebrate species in temperate and tropical regions 	World	1998/2009/ biannually	1970-2007	<ul style="list-style-type: none"> • Headline index for overall biodiversity status • Able to raise public awareness of the pressures on the biosphere 	<ul style="list-style-type: none"> • Partly based on estimations • Only global level • Low representativeness of population data (Data often taken from literature according to availability and not results of a designed program of sampling)
Natural Capital Index	PBL, Neth. Env. Assessment Agency/ RIVM	Human impact on biodiversity	<ul style="list-style-type: none"> • Ecosystem quantity: % of natural ecosystem area left • Ecosystem quality: % of species abundance left 	Global and regional, based on grid cells; plus selected countries	2002	~2000	<ul style="list-style-type: none"> • Policy relevance (CBD etc.) • Simple indicator of state and change in biodiversity 	<ul style="list-style-type: none"> • Not fixed index; rather, is an indicator framework • Quality and availability of data
Ecological Footprint	WWF with Zool. Society of London and Global Footprint Network	Human demand on the biosphere	<ul style="list-style-type: none"> • Natural resource use: crops, fish for food, timber, grass for livestock feed, CO₂ emissions 		1998/2010/ yearly	1960-2007	<ul style="list-style-type: none"> • High policy relevance and media attention • Applicability to various levels (from individual to global) 	<ul style="list-style-type: none"> • Statistical and methodological underpinning (not unambiguously accepted by a scientific community); difficult to refresh, cannot account for dynamic feedback loops

Environmental Performance Index	Yale Center for Environmental Law & Policy; CIESIN	Effectiveness of national environmental protection efforts	A total of 20 indicators on: <ul style="list-style-type: none"> • Environmental health (stress to human health): Environmental Burden of Disease, Air pollution, Water/ sanitation access • Ecosystem Vitality: Climate change, Agriculture, Fisheries, Forestry, Biodiversity/ habitat, Water and Ecosystem air pollution 	Most countries (163)	2006/2011/ biannually	2006-2009	<ul style="list-style-type: none"> • Medium-to-high policy relevance and media attention • Country ranking based on distance-to-target approach 	<ul style="list-style-type: none"> • Estimations of certain data variables and proxies for policy targets • Arbitrary weights assigned to particular indicators and policy categories
Environmental Vulnerability Index	South Pacific Islands Applied Geo-Science Commission (SOPAC) with UNEP and others	Environmental vulnerability to future shocks	50 indicators, aggregated also to sub-indices and single index, covering aspects of hazards, resistance, and damage (weather & climate, geology, geography, ecosystem resources & services, human populations)	40 countries (SIDS), extended to all countries	1999/2004/ irregularly	Year of publication	<ul style="list-style-type: none"> • Ranking of countries (5 classes) • Policy relevance 	<ul style="list-style-type: none"> • Narrow geographical focus, except for the SIDS countries • Combination of risk factors of a very dissimilar nature
FEEM Sustainability Index	Fondazione Eni Enrico Mattei (FEEM)	Economic, social and environmental sustainability	<ul style="list-style-type: none"> • Economic drivers (R&D, investments) • GDP/capita • Economic exposure (trade balance, public debt) • Population density • Well-being (education, health) • Social vulnerability (food expenditure, energy security and access, private health) • Energy (intensity and share of renewables) • Air quality (GHG/cap, CO₂ intensity) • Natural endowments (plant and animal diversity, water dependency) 	40 (developed) countries, plus macro-regions and world	2009/2011/ biannually	2005-2020	<ul style="list-style-type: none"> • The ability to project indicators over time (model-based policy simulation) • Policy relevance 	<ul style="list-style-type: none"> • Built on a specific general equilibrium model (GTAPE-ICES) • Index includes a lot of arbitrariness and strong assumptions
Genuine (or Adjusted Net) Savings	World Bank (WB)	Sustainability of investment policies	Gross national savings are adjusted by: <ul style="list-style-type: none"> • Deduction of capital consumption of produced assets to obtain net national savings • Addition of current expenditures on education (value of investments in human capital) • Deduction of depletion of a variety of natural resources • Deduction of pollution damages 	All countries (213)	1995/2008/ irregularly	1970-2008	<ul style="list-style-type: none"> • Relatively simple indicator • Use of standard national accounts 	<ul style="list-style-type: none"> • Assumption of no ecological limits (weak sustainability approach) • Limited media attention
Happy Planet Index	New Economic Foundation (NEF)	Degree to which long and happy lives are achieved per unit of environmental impact	<ul style="list-style-type: none"> • Life satisfaction • Life expectancy • Ecological Footprint 	179 countries (full time-series for OECD countries)	2006/2009/ yearly	1961-2005	<ul style="list-style-type: none"> • Measures environmental efficiency of wellbeing (combines environmental pressure with well-being factors) • Policy relevance • Attractiveness for media 	<ul style="list-style-type: none"> • see Ecological Footprint • some statistical adjustments made to allow easier interpretation • problems WITH the "happy life years" concept
Well-being Index	International Union for Conservation of Nature (IUCN)	Level of human and ecosystem well-being (Quality of life and the environment)	<ul style="list-style-type: none"> • 35 indicators for Human Well Being covering: health, population, wealth, education, communication, freedom, peace, crime, equity • 39 indicators for Ecosystem covering: land health, protected areas, water quality, water supply, global atmosphere, air quality, species diversity, 	160 countries	2001/2001/ one-time effort	Around 2000	<ul style="list-style-type: none"> • interesting concept of "egg of sustainability" • first index using the distance-to-target approach • lucid method of the index presentation – Barometer of Sustainability 	<ul style="list-style-type: none"> • not updated

			energy use, resource pressures					
Domestic Material Consumption	Eurostat	Natural resource use, including exports and imports of materials and products	<ul style="list-style-type: none"> Domestic Materials Consumption enriched by Raw Material Equivalents - RME data for 66 product groups (including services such as banking, education, health, communication) and 52 raw material categories (incl. energy supplies) 	Pilot calculations for selected countries (EU 27)	2006/2011/ pilot calculations	2000-2009	<ul style="list-style-type: none"> Indicator of the total mass of raw materials consumed by a country (incl. imports of materials and products) Policy relevance 	<ul style="list-style-type: none"> data demanding

³ It may also be considered a strength

Source: UNEP 2012c

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