

# Monitoring Sustainable Development: Lessons from MDG, Challenges for SDG

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## Abstract

The Millennium Development Goals (MDG) have been conceived as combination of human needs and basic rights that every individual around the world should be able to enjoy. According to the United Nations Millennium Declaration a list of eight goals has been agreed together with specific targets to be achieved by 2015.

Once this milestone has come, the monitoring of MDG pose a challenge, not only for the less developed countries (where a “data revolution” is needed), but also for developed countries, since some indicators are reported with very long lags, data coverage remains erratic and national statistical systems lack the capacity to generate high-quality data.

Furthermore, world leaders have recently agreed the new Sustainable Development Goals (SDG) connecting the issues of multidimensional poverty, inequality and exclusion, and sustainability. Although the methodology of SDG monitoring is still under development, a recent report by the Sustainable Development Solutions Network (SDSN, 2015) proposes 100 indicators and 10 principles for global monitoring indicators, emphasizing the need of simplicity, high frequency and disaggregation.

In this context, our paper provides an overview of the MDG achievements under the Poverty-Growth-Environment approach. A performance index is proposed with the aim of measuring progress towards the MDG goals in different countries, also analyzing the existing relationships between goal performance and economic growth.

**Keywords:** MDG, Sustainability, Poverty, Goals, Performance.

## 1. Sustainable Development: From MDG to SDG

The United Nations Millennium Declaration, signed in 2000 committed nations to a new global partnership to reduce extreme poverty, and achieve a series of targets, widely known as the Millennium Development Goals (MDGs). The challenge of ensuring environmental sustainability has been included in this list of goals, encompassing four different targets

referred to the integration of the principles of sustainable development into country policies, the mitigation of biodiversity loss, the reduction of the proportion of people without sustainable access to safe drinking water and sanitation and the achievement of a significant improvement in the lives of slum dwellers.

Despite the progress made on the MDGs, further efforts are required in the three dimensions of sustainable development: environmental, social, and economic. Therefore, world leaders have recently agreed a new 2030 Agenda for Sustainable Development, comprising 17 Sustainable Development Goals (SDG) also named Global Goals.

Table 1: Millennium Development Goals and Sustainable Development Goals

Millennium Development Goals (MDG)	Sustainable Development Goals (SDG)
1- Eradicate extreme poverty and hunger	1-End poverty in all its forms everywhere 2-End hunger, achieve food security and improved nutrition and promote sustainable agriculture 3-Ensure healthy lives and promote well-being for all at all ages
2- Achieve universal primary education 3- Promote gender equality and empower women	4-Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all 5-Achieve gender equality and empower all women and girls 8- Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all 10- Reduce inequality within and among countries
4- Reduce child mortality 5- Improve maternal health 6- Combat HIV/AIDS, malaria and other diseases	6- Ensure availability and sustainable management of water and sanitation for all
7- Ensure environmental sustainability	7- Ensure access to affordable, reliable, sustainable and modern energy for all 9- Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation 11- Make cities and human settlements inclusive, safe, resilient and sustainable 12- Ensure sustainable consumption and production patterns 13- Take urgent action to combat climate change and its impacts 14- Conserve and sustainably use the oceans, seas and marine resources for sustainable development 15- Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
8- Develop a global partnership for development	16- Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels 17- Strengthen the means of implementation and revitalize the global partnership for sustainable development

As table 1 shows, SDG adopt an integrated approach to achieve sustainable development connecting the issues of multidimensional poverty, inequality and exclusion, and sustainability. More specifically, seven SDG correspond to Poverty and Inequality and another seven are referred to environmental sustainability, thus significantly increasing the weight assigned to these fields in the Millennium Development Goals.

Furthermore, the Paris Climate Conference agreement (UNFCCC, 2015), recently adopted by 195 countries, sets out a global action plan to avoid dangerous climate change by limiting global warming, thus strengthening efforts to achieve SDG, particularly goal number 13.

Within this context, this paper aims at monitoring the environmental MDG paying particular attention to the most vulnerable people and countries. More specifically, a performance index is computed for both environmental and poverty goals, analysing the existing relationships and testing for convergence.

## 2. Monitoring environmental MDG

According to the United Nations, the MDGs provide a combination of human needs and basic rights that every individual around the world should be able to enjoy. More specifically, the seventh MDG goal is described as “*Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources*”, defining four specific targets and a list of ten indicators, as it is summarized in table 2.

Table 2: Environmental MDG Targets and Indicators

Targets	Indicators
7A: Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources	7.1 Proportion of Land Area covered by forest 7.2 CO2 emissions (total, per capita and per \$1 GD, 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
7B: Reduce biodiversity loss, achieving 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
7C: 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
7D: 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

With the aim of measuring the level of achievement of the previous targets, the cumulative growth rate can be computed as:

$$r = \frac{X_t}{X_{1990}} - 1 \quad (1)$$

where  $X_t, X_{1990}$  respectively denote the final and initial values of the considered variables.

Moreover, in the case of indicators including a specific target  $X_t^*$ , a Performance Index can be defined (López & Pérez, 2013) as:

$$I_t = \frac{X_t - X_{1990}}{X_t^* - X_{1990}} \quad (2)$$

Despite the lack of information for the less developed regions and some limitations in data coverage and quality, the MDG database allows the computation of the proposed measures in a wide variety of countries, allowing a monitoring of the environmental goals. Considering that special attention must be paid to the most vulnerable people, our study includes -besides targets 7C and 7D- the analysis of goal 1 (“*reducing poverty*”), through a performance index for the proportion of people living with less than 1.25 dollars a day. We believe that the inclusion of this indicator is particularly interesting since, according to Bourguignon (2004) the rapid elimination of absolute poverty, under all forms, is a meaningful goal for development.

### 3. Empirical findings

A classification of countries can be established according to the obtained results in both environmental and poverty indicators, as collected in table 3. In general terms, countries behave satisfactorily, especially with regard to poverty, as it has been stressed in some recent reports (United Nations, 2015). However, some difficulties are found regarding the evolution of Carbon dioxide emissions (where success is achieved in only 29% of the countries) and the percentage of population living in slums (in this case the rate of successful countries is 32,5%).

Table 3: Classification of countries according to environmental performance and poverty reduction

Poverty Reduction	High	Australia, Comoros, Niue, Virgin Islands,	Austria, Cyprus, Grenada, Israel, Japan, Kuwait, Netherlands, Norway, Reunion, Seychelles, Spain	Andorra, Belgium, Canada, Cook Islands, Czech Republic, Denmark, Finland, France, French Polynesia, Germany, Greenland, Guam, Iceland, Italy, Luxembourg, Micronesia, Monaco, Rep. Moldova, Singapore, Slovakia, Slovenia, Sweden, Switzerland, Macedonia, United Arab Emirates, United Kingdom, Yemen
	Medium	Algeria, Angola, Argentina, Bangladesh, Belize, Benin, Bolivia, Botswana, Brazil, Burkina Faso, Cambodia, Cameroon, Chad, Ecuador, Eritrea, Ethiopia, Ghana, Guatemala, Guinea, Haiti, Honduras, Indonesia, Kenya, Madagascar, Malawi, Malaysia, Maldives, Mali, Mexico, Mozambique, Namibia, Nepal, Pakistan, Panama, Paraguay, Peru, Senegal, Sierra Leone, Sri Lanka, Thailand, Togo, Trinidad Tobago, Uganda, Tanzania, Venezuela	Afghanistan, Bhutan, Burundi, Central African Republic, Chile, China, Colombia, Costa Rica, Dem Rep Congo, Dominican Republic, Egypt, Fiji, Greece, Guyana, India, Iran, Jamaica, Jordan, Kazakhstan, Kiribati, Libya, Mauritania, Morocco, Niger, Philippines, Portugal, Saint Lucia, Saudi Arabia, South Africa, Swaziland, Tonga, Tunisia, Turkey, Uruguay, Vietnam, Zambia	Aruba, Azerbaijan, Bahrain, Belarus, Bulgaria, Cote d'Ivoire, Croatia, Estonia, Hungary, Ireland, Kyrgyzstan, Lithuania, Romania, Rwanda, Serbia, Syria, United States, Uzbekistan
	Low	Antigua and Barbuda, Bosnia and Herzegovina, El Salvador, Georgia, Mauritius, Montserrat, Nicaragua, Nigeria, Papua N Guinea, Zimbabwe	Barbados, Samoa	Marshall Islands, Palau, Puerto Rico, Russian Fed, Sudan, Tuvalu
		Low	Medium	High
		Environmental performance		

As we have previously said, the achievement of the MDGs is particularly important for poor regions and countries, thus suggesting the need of analyzing the role of economic growth and testing for convergence. With this aim, table 4 collects the correlation coefficients between the rate of economic growth (referred to Gross Domestic Product per capita) detecting some positive results (economic growth is positively correlated with the recovery of forest and protected terrestrial and marine areas) but also some worrying facts. First, the positive correlation between economic growth and CO<sub>2</sub> emissions leads to the Environmental Kuznets Curve debate [Koirala et al (2011), López et al (2014), Pérez & López (2015), among others] and second, economic growth does not seem to help in the achievement of some poverty-related environmental goals, as those referred to the access of drinking water, sanitation and housing facilities.

Table 4: Environmental MDGs: Growth and Convergence analysis

Indicator	Correlation with growth	Convergence Analysis	
		Estimated slope	R squared
7.1: Proportion of Land Area covered by forest	0.06	-0.006 (*)	0.02
7.2: CO2 emissions pc	0.23	-0.00006 (*)	0.02
7.3: Consumption of ozone-depleting substances	-0.15	-0.0002 (***)	0.21
7.6: Proportion of terrestrial and marine areas protected	0.06	-0.38 (***)	0.13
7.8: Proportion of the population using improved drinking water	-0.03	-0.03	0.01
7.9: Proportion of the population using improved sanitation facility	-0.11	-0.003	0.01
7.10 Proportion of urban population living in slums	0.03	0.008 (**)	0.07

\*\*\*significant at 1%; \*\*significant at 5%; \* significant at 10%

Regarding convergence, regressions have been run for each of the considered environmental indicators in order to test if the cumulative rates of growth are inversely related with the initial registered values (referred to year 1990). The obtained results appear in the last two columns of table 4, detecting some outstanding differences between indicators.

More specifically, only two out of seven regressions (related to indicators 7.3 and 7.6) lead to significant coefficients at the one percent level, while two estimated coefficients (referring to 7.8 and 7.9) result to be non-significant. Furthermore, a significant positive coefficient is found in the case of urban population living in slums, thus rejecting convergence for this indicator.

#### 4. Concluding Remarks

The Millennium Development Goals (MDGs) include the challenge of achieving environmental sustainability, specifying four targets referred to the development policies, the biodiversity loss, the proportion of people without access to safe drinking water and sanitation facilities and the improvement in the lives of slum dwellers.

Once the 2015 milestone has been reached, our analysis -based on the cumulative rate of growth and the performance index- show that most of the countries behave quite satisfactorily with regard to poverty, while some difficulties arise in the achievement of certain

environmental goals. Within this context, particular attention should be paid to CO<sub>2</sub> emissions (which appear to be positively correlated with economic growth) and some poverty-related environmental goals referred to the access of drinking water, sanitation and housing facilities.

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