

The Green Economy Progress Measurement Framework

Application (Second Edition)

*UNEP Technical Report: Evaluating national progress
towards poverty eradication and shared prosperity
within planetary boundaries*



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List of Acronyms

APEC	Asia-Pacific Economic Cooperation
FOEN	Swiss Federal Office for the Environment
GEP	Green Economy Progress
GGGI	Global Green Growth Institute
GGKP	Green Growth Knowledge Platform
GPP	Green Policy Platform
HDI	Human Development Index
ILO	International Labour Organization
IGE	Inclusive Green Economy
IWI	Inclusive Wealth Index
OECD	Organisation for Economic Co-operation and Development
PAGE	Partnership for Action on Green Economy
PPP	Purchasing Power Parity
SDGs	Sustainable Development Goals
SCP-HAT	Hotspot Analysis Tool for Sustainable Consumption and Production
UN	United Nations
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization
WDI	World Development Indicators
WIPO	World Intellectual Property Organization

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Executive summary

This publication presents an update to the application of the methodology at the global level with the latest data available. In addition, it introduces carbon, water stress, and land-use related biodiversity loss footprints to the Green Economy Progress (GEP) measurement framework, in particular to the dashboard of sustainability indicators. This is a critical addition to the GEP measurement framework because a large share of today's goods and services are produced by complex global value chains. This addition brings important considerations to the analysis. However, it also requires important modifications to the GEP Measurement Framework to incorporate them. The present publication presents a sensible way on how these type of indicators can be incorporated, and how they can add valuable information to the framework. As a robustness check, the report also presents in Annex III an alternative option and compare its results with the main alternative.

The GEP Measurement Framework is anchored in an Inclusive Green Economy (IGE) narrative. An Inclusive Green Economy is a pathway designed to address three main challenges faced by humanity, namely: (a) persistent poverty; (b) overstepped planetary boundaries; and (c) inequitable sharing of growing prosperity. The GEP Index captures these multi-dimensions of an Inclusive Green Economy. It includes measurements of accumulation of capital – be it natural, low carbon and resource efficient, human, or social – which serves as input for producing goods and services in an environmentally friendly manner. It also attempts to capture the transition of consumption, investment, government spending and trade towards such goods and services. The GEP Measurement Framework also includes measurement of the outcome of enabling policies that are conducive to an Inclusive Green Economy. Progress in improving these outcomes is then analysed against specific planetary boundaries, such as greenhouse gas emissions, water stress and biodiversity loss.

In this updated version, the GEP Measurement Framework presents the GEP Index as in PAGE (2017b), but it has a new set of footprint indicators in the companion Dashboard of Sustainability indicators. These components are both analyzed individually and combined to allow ranking of progress by country (GEP+). The first component, the GEP Index, measures the progress made in improving the well-being of current generations, in association with the economic opportunities, social inclusiveness and environmental protection they benefit from. It is composed of 13 indicators that capture critical issues faced in achieving an Inclusive Green Economy transition, such as material footprint and inequality. The GEP Index focuses on the progress achieved by countries with respect to a target set for each individual indicator. Construction of the GEP Index utilizes a weighting system that allows for assessment of how far off a country is from the global threshold on a specific component of an Inclusive Green Economy (an indicator) and evaluation of the relative importance of one component (indicator) with respect to the others from the country's perspective. The second component, Dashboard of Sustainability, includes five indicators that track the sustainability of any progress that has been achieved (including measures from both the consumption and production perspective). Its role is to monitor the long-term sustainability of the factors underpinning humanity's current and future well-being.

The update of the data for the GEP index until 2019 allows the expansion of the sample of countries, relative to PAGE (2017b), from 105 to 110, and for which the GEP+ can be calculated from 100 to 108. The values of the GEP index can be interpreted as follows: a positive value

implies that the country is making overall progress towards an IGE (a value greater than one implies that the country not only made progress but also exceeds its targets, e.g. the target is to increase the index by 3% and it increases it by 5%); while a negative value implies that the country is regressing or moving away from an IGE (a value lower than minus one implies that the country not only regress but it does so by exceeding its targets, e.g. the target is to increase the index by 3% and it reduces it by 5%).

Results show that in the update of information until 2019 reflect higher progress in the GEP index relative to what was achieved until 2014. For this updated version, there is a country for which progress is higher than one (Kenya, with a GEP Index of 1.57, indicating that progress for this country was higher than its initial targets). In total, there are nine countries for which the GEP Index is higher than 0.55, which was the maximum value observed in PAGE (2017b). In terms of regions, East Asia and the Pacific, Europe and Central Asia are the regions where results are more mixed in terms of progress. East Asia and the Pacific is the region where most countries experienced regress (negative GEP Index). All South Asian and Middle East and North African countries experienced green economy progress (all of them have a positive GEP Index value). Most of countries in Latin America and the Caribbean, Sub-Saharan Africa, and the very high HDI countries have made green economy progress.

In terms of HDI group results are particularly mixed for the high HDI group, in which 50 per cent of countries show a regress (with an average value of -0.13 for the countries experiencing regress and a median value for the group of 0.03). However, the majority of countries in the other HDI groups experienced progress: 34 out of 37 countries in the very high HDI group, 18 out of 22 countries in the medium HDI group and almost all countries (17 out of 18) in the low HDI group (with median values of the GEP Index of 0.15, 0.13 and 0.14, respectively).

Results show that, on average, countries are experiencing regress in most of the dashboard indicators. In other words, countries are on average exceeding planetary boundaries, which undermines the progress towards an IGE captured by the GEP index. In particular, results show that only 37 out of 108 countries (34 per cent) are making progress with respect to carbon footprint. For water stress, only 47 (44 per cent) out of 108 countries are making progress. For emissions of nitrogen 59 out of 103 countries (57 per cent) are experiencing progress (although the average progress is negative). The only two indicators for which the average of countries are making progress are the land-use related biodiversity loss and Inclusive Wealth Index, with average progress of 0.41 and 0.31 respectively. However, results show that the majority of counties are regressing in the natural capital component of the Inclusive Wealth Index (88 per cent).

The analysis shows a clear difference when progress of the dashboard indicators is assessed using footprint indicators, since for all indicators progress was substantially higher (or regress substantially lower) when measured with production side indicators instead of footprint indicators. Results are relatively similar only for Land-use related biodiversity loss.

Results of incorporating the footprint indicate that 30 countries in our sample (27.8%) were able to achieve positive progress (or no regress) in all the Dashboard of Sustainability indicators as well as a positive GEP Index score. The two most important factors explaining the worst performance of countries are GHG emission with 46.3% of countries (50 out of 108) experienced their worst performance, and water stress where 38.9% (42 out of 108) experienced their worst performance.

Results for the GEP index and its components for the PAGE countries (with a GEP index for 17 out of 20) shows that 14 out of 17 countries have a positive GEP index, in other words, that they have made progress towards an Inclusive Green Economy. However, when we use the information from the dashboard of sustainability indicators to calculate the GEP+, South Africa was the only country able to achieve positive progress in all the Dashboard of Sustainability indicators as well as a positive GEP Index score. This indicates that for PAGE countries the progress achieved in the GEP index may not be sustainable, given the regress on the dashboard sustainability indicators.

More generally, although the GEP Index results are encouraging, they nevertheless show the amount of effort that is still needed to ensure that improving human well-being does not come at the expense of key stocks of capital. Individual results on the Dashboard of Sustainability indicators reveal that countries are, on average, regressing in their sustainability indicators, i.e. they are surpassing planetary boundaries.

The GEP measurement framework will keep updating and expanding the set of indicators used, as they become available. In addition, the framework will keep improving and expanding its methodological approach to the inclusion of different indicators, as the introduction of the footprint indicators just showed. This agenda has proven to be informative to policymakers and practitioners in their efforts to promote an Inclusive Green Economy, and this update is a contribution to such purpose. The inclusion of footprint indicators increases its value added, by allowing users to interpret the implications of progress on the Dashboard of Sustainability indicators, when considered at the same time from the production and consumption side.

1. Introduction

In June 2012, the United Nations Conference on Sustainable Development ("Rio+20") endorsed a series of agreements, two of which stand out with the ability to alter the way countries approach sustainability. First, governments agreed to negotiate a set of Sustainable Development Goals (SDGs) that would be universal, aspirational and transformational. Second, they agreed that a green economy approach could be a tool for achieving this sustainable development by contributing to *"(...) eradicating poverty as well as sustained economic growth, enhancing social inclusion, improving human welfare and creating opportunities for employment and decent work for all, while maintaining the healthy functioning of the Earth's ecosystems."* (Art. 56, "The Future we want")¹. In this context, Rio+20 also called on the United Nations to provide technical assistance to those countries wishing to pursue green economy policies, including through the creation of measures and metrics that would help track progress of efforts to green economies and achieve sustainable development. In September 2015, 193 UN Member States agreed on a new Sustainable Development Agenda to end poverty by 2030 and pursue a sustainable future, supported by a list of 17 SDGs and 169 related targets.

As the global leader of the Green Economy Initiative, UNEP is well positioned to catalyse the development of green economy indicators with a view to supporting the implementation of the green economy concept at the country level. At the global level, UNEP conducted a study in 2012 on how to use indicators to develop and track green economy policies (UNEP, 2012). In 2013, UNEP partnered with the Organisation for Economic Co-operation and Development (OECD), the World Bank and the Global Green Growth Institute (GGGI), via the Green Growth Knowledge Partnership (GGKP) to develop a common green growth indicators framework (GGKP, 2013).

At the country level, UNEP, under the Partnership for Action on Green Economy (PAGE), developed a framework that combines four types of indicators into an integrated policymaking process (UNEP, 2014). Each type is designed to assist at specific stages of green economy policymaking. First, *indicators for issue identification* help identify and prioritize problems to be resolved through a green economy approach. Second, *indicators for policy formulation* help design solutions by defining targets and measuring different policy interventions. Third, *indicators for policy assessment* provide critical inputs for estimating the cross-sectoral impact of policy implementation and for evaluating the effectiveness of each policy option. Finally, *indicators for policy monitoring and evaluation* assess the real impact of implemented policies in the medium to long run. This framework was tested in Ghana, Mauritius, and Uruguay, where green economy indicators were identified as powerful instruments to engage stakeholders in shaping the policymaking process (UNEP, 2015). However, the country studies also identified challenges in terms of availability and quality of data².

In order to bridge measurement initiatives at the global level with the indicator work carried out at the country level, UNEP developed in 2017 the GEP Measurement Framework to facilitate cross-country comparison of national efforts to transition to greener and more inclusive economies.

¹ United Nations (2012).

² See GGKP (2016) for a review of main approaches and indicators and the identification of research gaps.

In September 2018, Switzerland made its Financial Contribution, through FOEN, to UNEP to with the goal of “Strengthening the environmental footprints and planetary boundaries concepts within the Green Economy Progress Measurement Framework.” A substantial part of this project focused on a study to assess the feasibility of integrating three environmental footprint indicators (i.e. greenhouse gas, water and biodiversity from consumption side) into UNEP’s Green Economy Progress Measurement Framework (GEPMF).³

The collaboration for strengthening the environmental footprints and planetary boundaries concept within the GEPMF provided an opportunity to create synergies with tools and resources provided by other initiatives hosted by UNEP, notably the International Resource Panel (IRP) and the Lifecycle Initiative (LCI). Specifically, the study looked at how to incorporate these footprint indicators, drawing from the Sustainable Consumption and Production Hotspot Analysis Tool (SCP-HAT). The SCP-HAT was developed through collaboration among the IRP, LCI and the One Planet Network (the latter is also hosted by UNEP).

The study recommended that all three environmental footprint indicators be incorporated into the GEPMF. The first priority would be to integrate the greenhouse (GHG) footprint indicator. The other two (water and biodiversity) could either be incorporated at the same time as GHG or subsequently as water and land use are already captured in the GEPMF (specifically in its Dashboard on Sustainability), but only from a production perspective and as pressure indicators rather than impact indicators.

UNEP and FOEN continued collaboration based on a second Financial Contribution to strengthen the environmental footprints and planetary boundaries concepts within the GEPMF by incorporating three environmental footprint indicators: GHG, water and biodiversity. The process of incorporation will substantially contribute to the wider effort to maximize synergies and create direct linkages between the GEPMF, a framework for measuring a country’s transition to an inclusive green economy, and the SCP-HAT, a tool aimed at supporting the design of national action plans for sustainable consumption and production and/or green economy action plans.⁴

The GEP Measurement Framework is flexible enough that it has been applied to regions and countries (e.g. South Africa, and the Jiangsu and Fujian province in China). The Framework has also been applied to track specific SDGs, like SDG 7 related to energy (Herrero et. al. 2020). The incorporation of footprint indicators is an important improvement of the Framework that could also be beneficial to these and future extensions/application.

³ FOEN Financial Contribution to UNEP, 10 September 2018 (including the “Concept note for strengthening the environmental footprints and planetary boundaries concept within the Green Economy Progress Measurement Framework”).

⁴ See the Green Growth Knowledge Partnership (GGKP) webinar: “What’s Your Country’s Footprint? A close look at environmental footprint indicators and multi-regional input-output tables.”

2. Design of the GEP Measurement Framework

The **GEP Measurement Framework**⁵ is composed of a **GEP Index** and a companion **Dashboard of Sustainability indicators**. Figure 1 presents the GEP Measurement Framework and its parts. The **GEP Index** is used to track the changes in green economy indicators, relative to desired changes, which directly or indirectly impact current human well-being. It captures particular characteristics of the Inclusive Green Economy concept with a set of multidimensional indicators that cover aspects of at least two dimensions of sustainability⁶ (e.g. indicators that capture the link between health and the environment). The GEP Index reflects the weighted progress achieved by countries with respect to targets set within planetary boundaries and relevant thresholds across several indicators. The value of the GEP Index enables countries to gain an overview of their progress towards greening the economy.

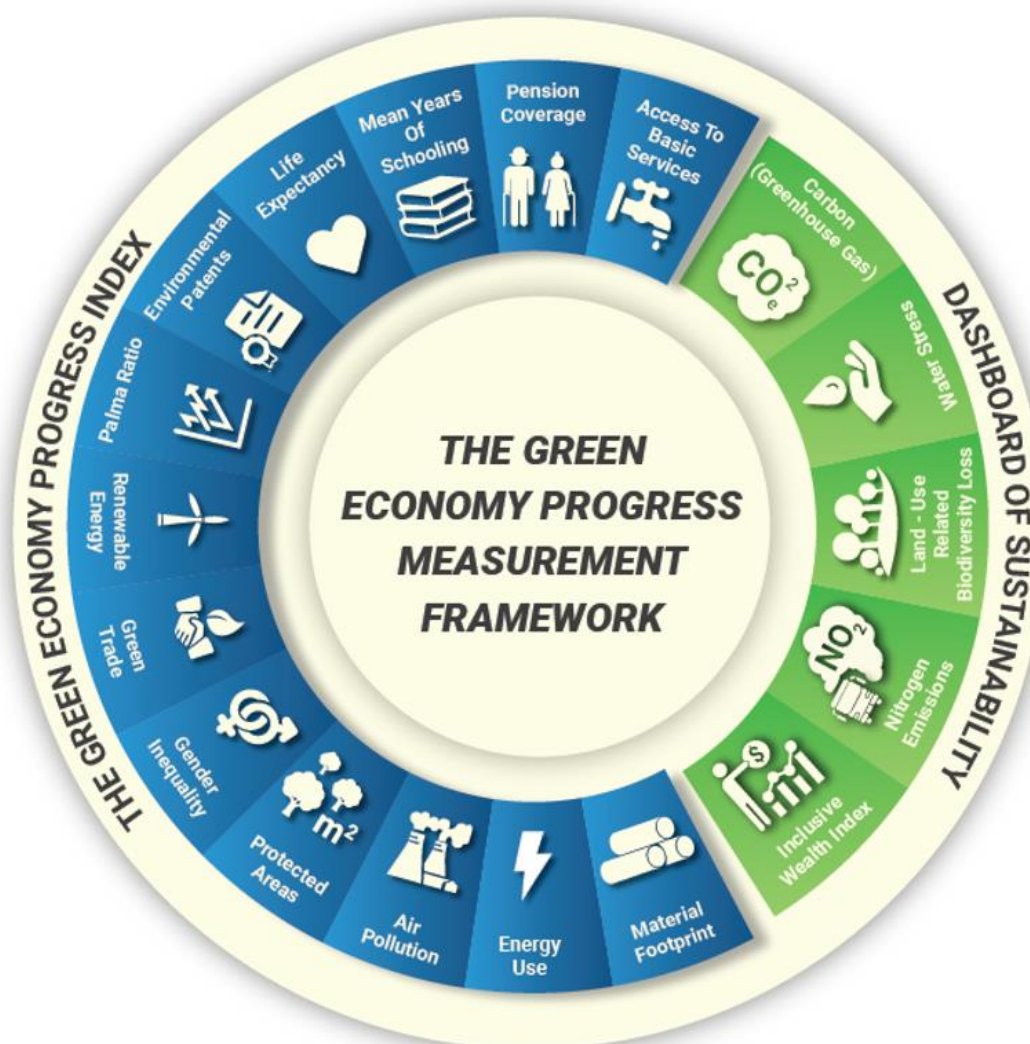
The **Dashboard of Sustainability** aims to monitor the long-term sustainability of any short-term progress as measured by the GEP Index. It tracks some of the main forms of natural capital (greenhouse gas emissions, water and biodiversity, emissions of nitrogen), as well as other key stocks of capital (e.g. human, health, Inclusive Wealth Index) which affect long-term sustainability. A country that manages to conserve the value of its natural assets (i.e. non-decreasing stocks of natural capital), for example, will be considered to be making progress. In this way, the dashboard acts to monitor the lasting prospects of green economy progress within a given country, highlighting impacts on environment and society. The main advantage of this second edition with respect to the previous is the inclusion of footprint indicators to the Dashboard of Sustainability, which significantly improve our understanding of the drivers of Green Economy Progress.

A final overall ranking of progress in achieving targets is obtained by comparing progress on the indicators in the dashboard with any green economy progress made, as measured by the GEP Index. The Protective Criterion can be used to produce a ranking of all GEP Index-dashboard profiles, ranking countries according to their least-performing type of progress based on the principle of Priority to the Worst Achievement. This ranking is nicknamed the **GEP+** and is further discussed in Section 3.

⁵ The design of the GEP measurement framework benefitted from the input of participants at two workshops held in April and June 2015 (see PAGE (2017b) for further details). In addition, the participants of the workshop in June 2020 contributed to incorporating the footprint indicators into the framework.

⁶ Multidimensional indicators cover aspects of at least two dimensions of sustainable development (e.g. economic, social and environmental).

Figure 1: The Green Economy Progress Measurement Framework's parts



Note: Figure created by the authors.

2.1 Selection criteria

To decide which indicators should be included in the GEP Measurement Framework, the following selection criteria were used. The first selection criterion is to identify indicators that are related to one specific challenge that an Inclusive Green Economy seeks to address and/or to a category of the new generation of capital⁷. The indicators should capture policy outcomes in areas in which policymakers could invest more resources to green their economies and make them more inclusive (e.g. access to basic services).

The second selection criterion is data coverage. For indicators to be useful in comparing the progress made by countries in greening their economies, indicators must be adequate in terms of country development and time coverage (with information for countries from all regions/degree of development, and with observations over a period of at least two years). The

⁷ This is further explained in PAGE (2017b).

two years considered in the GEP Index in this initial instance are 2004 and 2019, and the data is averaged over a five-year period around these years⁸. This approach was chosen based on availability of comparative data and because it takes time for green economy indicators to fully reflect policy changes. For the sake of simplification, the averaged data over 2000-2004 will be referred to as “2004” and the averaged data over 2015-2019 will be referred to as “2019” from this point forward in this document. The temporal frame can be updated as more data becomes readily accessible. Indicators that fulfil the first selection criterion and for which there is good data coverage were preferred.

The third selection criterion is data access. Data should be publically available through international organizations with the mandate of collecting and harmonizing global databases and, in some cases, from NGOs with excellent records of accomplishment in the regular production of indicators (e.g. the World Resource Institute). This will allow the results of the GEP Index to be replicated, tested and expanded.

Finally, the fourth criterion, which applies solely to the indicators in the Dashboard of Sustainability, is that they should be widely recognized as representing a planetary boundary (water stress, greenhouse gas emissions, biodiversity loss, emissions of nitrogen, Inclusive Wealth Index) and have an estimated threshold value derived from the literature.

It is important to note that it was not possible to include some indicators of interest in the GEP Index, either because they are still at a preliminary stage of development (e.g. green jobs), or because data are proprietary (e.g. renewable energy investments).

2.2 Mapping the choice of indicators with the Inclusive Green Economy narrative

As presented in Section 2, an Inclusive Green Economy supports the promotion of investments and policies by stimulating the supply of environmentally friendly goods and services, and by creating enabling conditions for these new goods and services to be absorbed by the economy. As one of the main levers used to initiate an Inclusive Green Economy transformation, policy outcomes must be balanced between the new aggregate supply and aggregate demand to achieve a new economic equilibrium. Enabling policies, when combined with the accumulation of a new generation of capital that promotes the production of environmentally friendly goods and services, have the potential to create multidimensional benefits. These include, for example, new economic opportunities, reduced environmental impacts, social improvements and new jobs, and the overall capacity of the economy of absorbing these new green goods and services.

An Inclusive Green Economy promotes the creation or enablement of a new generation of capital that includes natural capital, low carbon, resource efficient physical capital, human capital with modern and green skills, and social capital that ensures equity and inclusiveness.

Natural capital “(...) is any stock or flow of energy and material that produces goods and services. Examples of natural capital include:

- Resources - renewable and non-renewable materials

⁸ For most indicators, 2000-2004 and 2010-2019 averages are used. However, for social indicators, for which measurement frequency is lower, averages between 1997-2004 and 2010-2019 are used. In a future version of the GEP measurement framework, other years could be included (subject to data availability).

- Sinks - that absorb, neutralize or recycle wastes
- Processes - such as climate regulation"⁹

Natural capital is the basis of life and production. This category also includes "newly created natural capital" through the implementation of policies: for example, natural capital saved by transforming the production process (i.e. becoming less polluting and more energy efficient), or enabled to naturally reproduce by introducing conservation policies or policies that reduce the pressure on natural resources.

Low carbon, resource efficient physical capital is a sub-category of manufactured capital. "Manufactured Capital comprises material goods or fixed assets which contribute to the production process rather than being the output itself". This type of capital includes elements such as roads, buildings, vehicles, energy and water infrastructure that minimize any negative impacts on the environment, enable access to services, reduce pollution, environmental risks, and restore and sustain ecosystem health and resilience.

Human capital "(...) consists of people's health, knowledge, skills and motivation". Enhancing human capital through public and private support to research and development, education and training is central for productive work and a flourishing economy. In particular, the GEP Index focuses on measuring the outcome of knowledge and skill generation in terms of education and employment-enhancing environmental technologies.

Social capital "(...) concerns the institutions that help us maintain and develop human capital in partnership with others, e.g. families, communities, businesses, trade unions, schools and voluntary organisations". It includes the intangible capital created by policies through institutions that reduce vertical and horizontal inequalities (e.g. by promoting non-discrimination in educational and employment opportunities, gender, race and income equality).

As envisaged by UNEP, this new generation of capital will serve as input in the production of environmentally friendly goods and services to be absorbed by the economy. Public spending may be subsumed under consumption, investment and trade.

Consumption: environmentally friendly goods and services will be "used"¹⁰ by the private and public sector. The ability to enjoy a cleaner environment and benefit from healthier lives, to purchase more sustainable consumption goods and services, and to evolve in more equal societies, where human rights are recognized and respected, will improve current human well-being and is in line with reducing the inequitable sharing of growing prosperity.

Investment: the revenue generated by the production of environmentally friendly goods and services may be invested in the production of those goods and services, or in the substitution of environmentally harmful products with environmentally friendly ones, thereby creating a virtuous circle.

⁹ For more information, see: <https://www.forumforthefuture.org/project/five-capitals/overview>.

¹⁰ The word "used" includes the consumptive and non-consumptive value of a clean environment, preferably in a more equitable society.

Trade: Many environmentally friendly goods and services can be traded, thereby potentially generating new income, encouraging innovation, productivity gains and sustaining jobs, while lowering the negative impact of trade on the environment.

The GEP Measurement Framework is, however, not limited to the production sphere: it also encompasses indicators¹¹ that are linked to addressing poverty eradication and overstepped planetary boundaries. Figure 2 gives an overview of the indicators included in the GEP Measurement Framework, mapped in the Inclusive Green Economy analytical framework.

¹¹ Indicators in the GEP index are outcome (or performance) indicators that are affected by policy choices. By contrast, most of the indicators in the dashboard are state indicators because monitoring stocks, in order to assess progress within planetary boundaries, is the focus of the dashboard.

Figure 2 : Indicators in the GEP Measurement Framework and the Inclusive Green Economy analytical framework



Note: Figure created by the authors. Indicators in *italic* are in the GEP Index, those in **bold** are in the dashboard.

2.2.1 Components of the GEP Index

For this update, we kept the same set of indicators that are based on the Inclusive Green Economy analytical framework (2017a,b). The GEP Index includes 13 multidimensional indicators¹² that are associated with the three challenges of Inclusive Green Economy (persistent poverty, overstepped planetary boundaries and inequitable sharing of growing prosperity). These indicators aim to capture key components in the transition towards an Inclusive Green Economy related to policy and investment outcomes on the new aggregate supply and aggregate demand¹³. Each indicator also meets the data requirements as mentioned above (time, country coverage and public accessibility).

Green trade, as measured by the share of environmental exports in total exports, captures how competitive a country is in producing and trading environmental goods¹⁴. These environmental goods help to reduce environmental risk and pollution levels, and that are environmentally friendly in terms of their production process, use, and/or disposal. This indicator measures the outcome of investments and regulatory policies in favour of green trade.

Environmental patents, as measured by the share of patents that are related to environmental technologies¹⁵, captures the innovative capacity of a country to manufacture goods and services that have a lower negative, or even positive, impact on the environment. Green innovation can result from public R&D policies or from private initiatives. Environmentally-related inventions will serve as input in the production of green goods and services, thereby creating new markets and potentially new employment opportunities.

Renewable energy supply measures the percentage of renewable energy in total energy supply. To enable the use of renewable energy sources, incentives that change price signals towards investing in new infrastructure need to be in place. This will enable investors to reap the benefits of diversifying energy markets.

Energy use, as measured by the kilograms of oil equivalent consumed per USD 1,000 of GDP (constant 2011 PPP), captures the degree of energy intensity of an economy. A decreasing energy intensity trend can be the result of the implementation of a more stringent environmental policy or the result of companies trying to reduce their costs in response to high input prices. A more energy efficient economy is one that sets natural capital free for the conservation of ecological and biodiversity services. Resource efficiency will also decrease production costs and could increase competitiveness, thereby generating an increase in income. In turn, new income as well

¹² Shown in italic in Figure 3 (the remaining indicators (in bold) appear in the dashboard, see Section 3.2.2).

¹³ This is one method to balance policy outcomes captured by green economy indicators between aggregate demand and aggregate supply. It is, however, not the only option as some indicators can be related to impacts on both the aggregate supply and aggregate demand side. Moreover, general equilibrium effects are not considered here.

¹⁴ According to the OECD and Eurostat, “environmental goods” refer to a set of goods that can be used “to measure, prevent, limit, minimize or correct environmental damage to water, air, and soil, as well as problems related to waste, noise and eco-systems” (OECD/Eurostat 1999).

¹⁵ Another alternative would be to use data on R&D spending. However, not all R&D spending is for green technology innovation and it is difficult to find disaggregated green R&D data that meet the selection criteria (good country coverage with a balance between developed and developing countries, good time coverage and publically accessible data) in order to calculate progress.

as a portion of the preserved natural capital could materialize into new consumption opportunities.

The Palma ratio, named after the Chilean economist José Gabriel Palma, is defined as the ratio of the richest 10 per cent of the population's share in gross national income divided by the share of the poorest 40 per cent of the population¹⁶. In recent years, policymakers have preferred to use the Palma ratio over the Gini index when referring to income inequality as it puts a special focus on the inclusion of the most vulnerable. Policies that promote the transition to an Inclusive Green Economy by creating jobs and generating new income for a wider share of the population should result in reduced inequality. The Palma ratio, in that sense, should reflect the outcome of these new policies, which in turn allow a larger share of the population to access new consumption opportunities.

Access to basic services, measured by the percentage of the population with **access to electricity, access to water, and access to sanitation**, is included in the GEP Index in order to capture some of the different forms of absolute poverty¹⁷. Access to basic services affects citizens' ability to experience direct (e.g. consumption, health) and indirect (e.g. educational and entrepreneurial) development opportunities. For example, learning opportunities may be lost because of lack of access to electricity, or because travel time to collect water impedes visiting school on a regular basis, or because of higher incidences of diarrhoea due to insufficient collection and treatment of wastewater.

- **Access to electricity:** Enabling greater access to electricity will require investments in the electricity grid, transmission and distribution, as well as decentralized electricity systems. Electricity generation from low-carbon and renewable sources should also be promoted.
- **Access to water:** Making progress in providing access to basic services requires new investments in, among other infrastructure, pipelines and water distribution and purification systems. Impacts on the environment should also be considered, including how to avoid water stress.
- **Access to sanitation:** To improve access to sanitation, new facilities must be built while ensuring that there are corresponding waste and sewage management, collection and treatment systems in place to handle a higher number of sanitation facilities. These investments and the services they provide may create new employment and economic opportunities.

Air pollution, as measured by the concentration of atmospheric particulates of 2.5 micrometres or less in diameter (PM_{2.5}), is included to capture the nexus between the economic and the social/environmental components of sustainability. Particulates can be found in smoke and haze from sources such as forest fires, or they can form when gases emitted from power plants, industries and automobiles react in the air. Air pollution directly impacts the quality of the

¹⁶ José Gabriel Palma observed that the share of middle class incomes usually represented about 50 per cent of gross national income, while the other half was divided between the richest 10 per cent and poorest 40 per cent. The share of those two groups, however, varied considerably across countries. See Palma, José Gabriel (2011) for more information.

¹⁷ Access to water, electricity and sanitation are treated as a single index (access to basic services) in the GEP index.

environment. Additionally, through its related impacts on human health, it also affects labour productivity and social inclusiveness by reducing educational and work opportunities, and thus current and future economic opportunities.

Material footprint per capita¹⁸ measures the consumption of raw material of used biotic and abiotic materials (tons/person). This measure indicates how much of the environment is consumed to sustain the current level of average consumption. A lower material footprint will make more natural capital available for production and consumption. It is also synonymous with an economy with higher resource efficiency. It is therefore an alternative indicator for measuring efficiency and, as it considers material efficiency in per capita terms, complements the energy efficiency perspective. For a preliminary discussion on potential limit values based on planetary boundaries see e.g. Desing et al. (2020).

Protected areas (marine and terrestrial) are measured as the percentage of marine and land areas that are protected in a total area. Increasing the coverage of protected areas reflects a country's recognition of the value of conserving natural capital for its current well-being and development. Protected areas contribute to the maintenance of natural capital stock. For example, establishing national parks to protect natural habitats and conserve biodiversity is also a way to protect the livelihoods of poor communities, attract sustainable tourism and potentially create new job opportunities in the tourism and environmental conservation sectors, in turn generating new incomes and promoting social inclusiveness¹⁹.

Gender inequality is measured by the United Nations Development Programme's gender inequality index (GII). It highlights the loss in potential development due to the disparity between female and male achievements in empowerment and economic status and reflects a country's position relative to normative ideals across key dimensions of women's health. The index combines data for maternal mortality, adolescent birth rate, women's share of seats in parliament, education rates and participation in the labour force. The gender inequality index ranges between 0 and 1 and higher values indicate higher levels of inequality²⁰.

Pension coverage is measured by the share of the population above statutory pensionable age receiving an old age pension based on contribution and sex²¹.

¹⁸ This data has been collected by the International Resource Panel, which was launched by UNEP in 2007 to build and share the knowledge needed to improve the use of resources worldwide and to steer economies away from over-consumption, waste and ecological harm for a more prosperous and sustainable future.

¹⁹ Other biodiversity indicators such as the ones listed in the Biodiversity Indicators Partnership factsheets were explored, but were not retained due to insufficient time or country development level coverage. For more information, see: <http://www.bipindicators.net/>.

²⁰ The GII relies on data from major publicly available international databases, including the maternal mortality ratio from the United Nations Maternal Mortality Estimation Inter-Agency Group (MMEIG), which includes WHO, UNICEF, UNFPA and the World Bank; adolescent birth rates from UNDESA's World Population Prospects; educational attainment statistics from the UNESCO Institute for Statistics educational attainment tables and the Barro-Lee datasets; parliamentary representation from the International Parliamentary Union (IPU); and labour market participation from the International Labour Organization's Key Indicators of the Labour Market (KILM). For more information, see <http://hdr.undp.org/en/content/gender-inequality-index-gii>.

²¹ Source: ILO Social Security Inquiry Database. The objective of the ILO Social Security Inquiry (SSI) is to collect, store and disseminate comparable statistical data on social security worldwide. This includes expenditure and receipts of social protection schemes as well as data on protected persons, recipients of social benefits and benefit amounts. The rationale of the inquiry is to address the lack of (comparable) social security statistics outside

Education is measured by mean years of schooling, i.e. the average number of years of education received by people ages 25 and older, which is then converted from education attainment levels using the official durations of each level. Data on mean years of schooling is taken from UNDP/HDRO based on UNESCO's Institute for Statistics (UIS) educational attainment data and, for some countries, Barro and Lee's (2013) methodology where UIS data are not available.

Life expectancy is measured as the average number of years that a newborn infant could expect to live if prevailing patterns of age-specific mortality rates at the time of birth stay the same throughout the infant's life. Life expectancy at birth is taken from UNDP/HDRO and provided by the UN Population Division in the UN Department of Economic and Social Affairs (UNDESA).

Table 1: Components of the GEP Index

<i>Indicator</i>	<i>Description</i>	<i>Country coverage</i>	<i>Data Source</i>
Green trade	Export of environmental goods according to OECD and APEC (% of total export)	127	Internal calculations using UNCOMTRADE, OECD, APEC, UNEP
Environmental patents	As a measure of green technology innovation, patent publication in environmental technology by filing office (% of total patents)	67	WIPO
Renewable energy consumption	Share of renewable energy consumption (% of total final energy consumption)	171	Internal calculations using WDI
Energy use	Energy use (kg of oil equivalent) per USD 1,000 GDP (constant 2017 PPP).	129	WDI
Palma ratio	Ratio of the richest 10% of the population's share of income divided by the share of the poorest 40%	102	Internal calculations on WDI and OECD data ²²
Access to basic services	This is a composite measure created by the average access to three basic services with key social and environmental implications: Access to improved water sources (% of total population), Access to electricity (% of total population), Access to sanitation facilities (% of total population)	144	WDI
Air pollution	PM2.5 pollution mean annual exposure (micrograms per cubic meters)	185	WDI
Material footprint	Raw material consumption of used biotic and abiotic materials (tons/person)	167	International Resource Panel, UNEP
Marine and terrestrial protected areas	Sum of terrestrial protected area (% of total land area) and marine protected area (% of territorial waters) ²³	145 and 195, respectively	UNEP-WCMC via UNEP GRID

the OECD. In this respect, the inquiry adopts a systematic approach compatible with existing statistical frameworks such as the European System of Integrated Social Protection Statistics (ESSPROS) and the OECD (SOCX Social Expenditure Database).

²² The Palma ratio was constructed with observations from OECD and WDI datasets.

²³ The value of the measure of progress for this dimension is the simple average between each component taken separately (because each component has its own threshold). Due to data changes in the availability of information from the globally available databases this indicator was not updated, for which we use the values from PAGE (2017b).

Gender inequality index	A composite measure reflecting inequality in achievements between women and men across three dimensions: (a) reproductive health; (b) empowerment; and (c) the labor market	146	UNDP ²⁴
Pension coverage	Share of population above statutory pensionable age receiving an old age pension, by contribution and sex	111	ILO
Education (Mean years of schooling)	Average number of years of education received by people ages 25 and older, converted from education attainment levels using official durations of each level	176	UNDP ²⁵
Life expectancy	Life expectancy at birth indicates the number of years a new-born infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life	188	WDI ²⁶

2.2.2 Dashboard indicators

The Dashboard of Sustainability monitors key stocks of capital that are priorities to sustain life on the planet. Any loss in these key stocks of capital cannot be compensated by increasing another stock of capital. Progress in these areas can therefore only be assessed for each indicator individually, and cannot be assessed with an aggregate index. The role of the dashboard is to keep track of the long-term sustainability of the factors that support human well-being by complementing the information assessment of green economy progress in the GEP Index. Progress or regress made on the dashboard indicators is compared to thresholds that are calculated with respect to planetary boundaries (see Table 2). The dashboard therefore helps to frame the progress measured by the GEP Index in a sustainability perspective, which is important as any progress made in improving current human well-being should not come at the expense of future well-being.

To allow comparison of progress between the GEP Index and the dashboard, the sample of countries for the dashboard indicators is restricted by the sample of countries for which it was possible to construct a GEP Index (110 countries between 2004 - 2019). Section 5 focuses on the joint analysis of the GEP Index and the dashboard indicators for these 110 countries.

The criteria used for selecting the dashboard indicators are the same as for the GEP Index, but a fourth criterion applies uniquely to the indicators in the dashboard: the indicators should reflect a global planetary boundary for which there is evidence suggesting thresholds determined on the basis of the best available scientific knowledge.

²⁴ Definition: A composite measure reflecting inequality in achievement between women and men in three dimensions: reproductive health, empowerment and the labour market. See Technical note 4 at http://hdr.undp.org/sites/default/files/hdr2020_technical_notes.pdf for details on how the Gender Inequality Index is calculated.

²⁵ Definition: Average number of years of education received by people ages 25 and older, converted from education attainment levels using official durations of each level.
Source: UNESCO Institute for Statistics (2020), Barro and Lee (2018), ICF Macro Demographic and Health Surveys, UNICEF Multiple Indicator Cluster Surveys and OECD (2019b). For further information, see <http://hdr.undp.org/en/content/mean-years-schooling-adults-years>.

²⁶ Derived from (1) United Nations Population Division. World Population Prospects: 2019 Revision, or derived from male and female life expectancy at birth from sources such as: (2) Census reports and other statistical publications from national statistical offices, (3) Eurostat: Demographic Statistics, (4) United Nations Statistical Division. Population and Vital Statistics Report (various years), (5) U.S. Census Bureau: International Database, and (6) Secretariat of the Pacific Community: Statistics and Demography Programme. For further information, see <http://data.worldbank.org/indicator/SP.DYN.LE00.IN>.

This section introduces carbon (resp. greenhouse gas), water stress, and land-use related biodiversity loss footprints to the GEP measurement framework, in particular to the dashboard of sustainability indicators. This is a critical addition to the GEP measurement framework because a large share of today's goods and services are produced by complex global value chains. Footprint indicators allow assessing the cumulative environmental impacts of countries' consumption patterns, including the net impacts caused by its international trade (Cabernard and Pfister, 2021).

2.2.2.1 Data

The footprint indicators, carbon, water stress, and land-use related biodiversity loss, represent "bads", so progress implies a reduction of such indicators. The indicators are:

Carbon (Greenhouse gas) footprint Short-term: Impact indicator for climate change, with its short-term version is related to the rate of temperature change. The indicator recommended for short-term is Global Warming Potential 100 (GWP100). The corresponding characterization factors provided by UNEP are applied to GHG emissions data, with impact factors for 24 separate emissions including differentiation of fossil- and biogenic methane. Near-term climate forcing gases are excluded, as the UNEP LCI guidance recommends those for sensitivity analysis only (Piñero et. al., 2019).

Water stress: Impact indicator constructed using blue water consumption and water stress data for all crops and classified them into the eight crops sectors distinguished by EXIOBASE3.²⁷

Land-use related biodiversity loss: Impact indicator characterizing biodiversity impacts of land use, discerning occupation and transformation, based on the method developed by Chaudhary et al. (2015). In this first version of the SCP-HAT only land occupation is included (Piñero et. al., 2019).

In its basic conception, the approach adopted for the SCP-HAT is an Environmentally Extended Multi-Regional Input-Output (EE-MRIO) model coupled with Life Cycle Assessment (LCA) for environmental impact assessment. EE-MRIO is an analytical tool supported by the System of Environmental-Economic Accounting (SEEA), to attribute environmental burdens to final demand categories (United Nations et al. 2017). EE-MRIO adopts a top-down approach. Supply chain-wide environmental pressures and impacts are modelled at a macro level for broad product groups or industries. This is done by linking domestic data on pressures (e.g. material extraction) and impacts (e.g. deforestation) expressed in physical units (also called 'satellite accounts') with monetary data on transactions among economic sectors and final consumers of different countries (mathematical details in Annex I). Applying this approach to the SCP-HAT allows tracking the flow of goods and services by linking domestic pressures (national environment) with foreign consumption (countries A to F in Figure 1), and foreign pressures with domestic consumption. This characterization of global supply-chains and the identification of hotspots is developed at the level of economic sectors and final demand categories.

²⁷ Thanks to Cabernard, Livia and Stephan Pfister (2021) for facilitating their data for this report.

From planetary boundaries to national thresholds

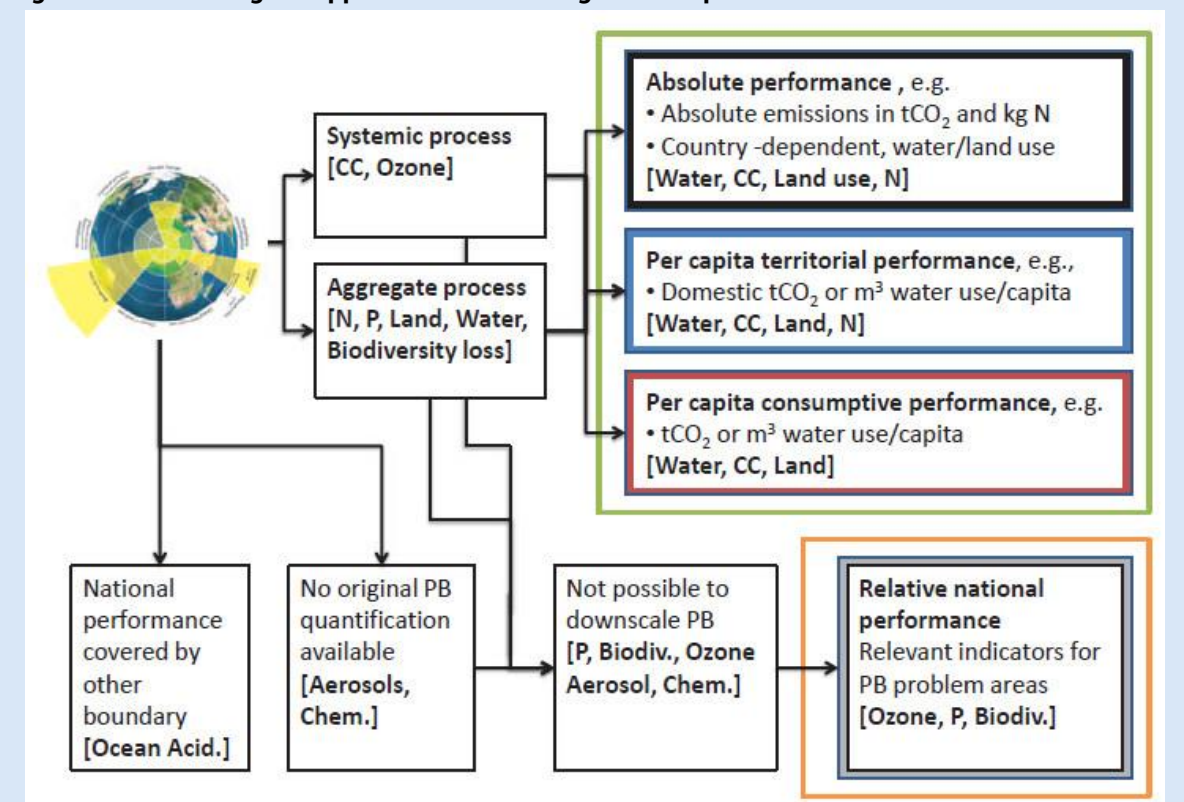
The framework proposed by Rockström et al. (2009) includes a set of nine planetary boundaries, seven of which¹ were quantified and for which specific boundary values were proposed. Since its introduction, the framework has become a point of reference not just for the scientific community but also amongst policy makers. The significant success of this framework is due to several reasons. First, the framework represents the first attempt to provide an inclusive set of quantified planetary boundaries that capture key global environmental challenges. Second, the framework not only identifies nine planetary boundaries, but it also provides boundary values for most of them, which allows for absolute benchmarking of countries according to the thresholds. Third, the selection of the nine planetary boundaries within the framework was based on scientific knowledge and not on the availability of data, as is too often the case, to the detriment of the accuracy of the selected indicators.

However, the analysis of Rockström et al. (2009) has some potential limitations. Indeed, some of the planetary boundaries (e.g. land use) represent more regional or local challenges rather than global ones, and this differentiation of spatial scale is absent from the framework. Moreover, although qualitative measurements for some of the planetary boundaries (e.g. land use) are as important as quantitative ones, indicators of quality are never considered. Another potential challenge relates to the numerous interactions between the different planetary boundaries, which were not considered in the 2009 study (but discussed in later studies), though they might have significant impacts on boundary values. The current planetary boundaries should therefore be considered as a first set of boundaries that may need adjustment, as interactions are better understood (Nykvist et al., 2013).

Different organizations have used this study as a starting point to conduct their own research, including the European Environment Agency together with the Swiss Federal Office for the environment (EEA, FOEN 2020), The Dutch PBL (PBL 2018). Pioneering this approach, the Swedish Environmental Protection Agency (SEPA) commissioned a study from the Stockholm Resilience Centre and the Stockholm Environment Institute in order to assess whether the planetary boundaries framework could apply to Sweden's national environmental quality objectives (Nykvist et al., 2013). In particular, the study quantifies national boundaries of four out of the nine planetary boundaries, i.e. climate change, nitrogen cycle, land use and water use. Based on the four indicators, two types of country performance are calculated: the *absolute* performance, which allows for the identification of the less environmentally friendly countries at a global level, and the *per capita* performance, which takes into consideration equity concerns and rights to development.

The methodology used to calculate both measures includes two steps (Figure 3): first, the boundaries are downscaled to per capita boundaries to obtain the per capita performance, then this value is multiplied by national population, in order to obtain the values of national absolute boundaries. The allocation process is specific for each of the four indicators, and a detailed description can be found in Nykvist et al., (2013).

Figure 3: Methodological approach to illustrating national performance



Source: Nykvist et al., (2013). National Environmental Performance on Planetary Boundaries: A study for the Swedish Environmental Protection Agency. SEPA: Stockholm.

¹ Climate change; ocean acidification; stratospheric ozone depletion; nitrogen cycle and phosphorus cycle; freshwater use; land use change; rate of biodiversity loss.

Finally, the Dashboard of Sustainability indicators also includes **nitrogen emissions per capit**, whose threshold was determined as the national level counterpart of planetary boundaries (dividing total estimates by either global population or by global terrestrial area) (Nykvist et al., 2013); ²⁸ and the **Inclusive Wealth Index (IWI)** (UNU-IHDP and UNEP, 2014) to take into account changes in the overall stocks of capital. The “threshold” used for the Inclusive Wealth Index is that it does not show a negative change (human and natural assets are not depleting) (UNU-IHDP and UNEP, 2014). Table 2 below presents the dashboard indicators, their coverage and their source. ²⁹

²⁸ This indicator was only updated for OECD countries, where new data was available.

²⁹ The coverage of 110 countries is restricted by the calculation of the GEP index. It does not represent the full coverage by any of the indicators in the dashboard.

Table 2: Dashboard indicators (Footprint indicators)

<i>Description of indicator</i>	<i>Country coverage</i>	<i>Threshold</i>	<i>Data Source</i>
Carbon (greenhouse gas) footprint short term (CO₂e/capita/year)	175	2 tons/capita/year	SCP-HAT
Water stress (Mio m³ H₂Oeq/1000 capita/year)	181	6.47 Mio m ³ H ₂ Oeq/1000 capita/year	Cabernard and Pfister (2021).
Land-use related biodiversity loss (global pico fraction of potentially disappeared species, global PDF/capita/year)	181	33 global pico-PDF per capita /year	SCP-HAT
Nitrogen emissions (kg/capita/year)	103	5 kg/capita/year	FAO through UNEP GRID
Inclusive Wealth Index (millions of constant 2005 US\$/capita)	100	non-negative change	UNU-IHDP and UNEP

2.2.3 "Goods" and "Bads"

The GEP Measurement Framework makes the distinction between "goods" and "bads". When the amount of "goods" increases, society is making progress towards an Inclusive Green Economy. However, when the amount of "bads" increases, society is moving further away from an Inclusive Green Economy (i.e. society is regressing). For example, an increase in inequality will almost, by definition, reduce inclusiveness and contribute to reduce current human well-being (this is why an increase in this indicator will be associated with a regress). Inequality is therefore considered a "bad". On the other hand, an increase in the share of green trade is associated with potential economic and employment opportunities, and will result in progress towards an Inclusive Green Economy. Green trade is therefore considered a "good". Table 3 below lists the 18 indicators of the GEP Measurement Framework according to their effect on the outcome of progress.

Table 3: Classification of indicators of the GEP Measurement Framework

<i>"Goods"</i>	<i>"Bads"</i>
<i>Green trade</i>	<i>Energy use</i>
<i>Green innovation</i>	<i>Inequality (Palma ratio)</i>
<i>Renewable energy</i>	<i>Air pollution</i>
<i>Access to water/sanitation/electricity</i>	<i>Material footprint</i>
<i>Protected areas</i>	<i>Gender inequality</i>
<i>Education</i>	Greenhouse gas emissions
<i>Life expectancy</i>	Water stress
<i>Pension coverage</i>	Land-use related biodiversity loss
Inclusive Wealth Index	Nitrogen emissions

Note: Indicators in italic are included in the GEP Index, those in bold are in the dashboard.

2.3 Target and thresholds

In practice, the **target y^*** is determined for each country by calculating the λ (for a "good") or the β (for a "bad") by using a relevant comparison group (e.g. countries with similar human development according to the Human Development Index). The idea is to multiply each country's initial value, y^0 , with the value of λ or β (depending on whether y is a "good" or a "bad") achieved by the 10 per cent best performing countries in the relevant comparison group. This data-driven

approach helps to set targets that are ambitious but feasible according to specific country characteristics of the relevant comparison group.

The temporal period considered for the calculation of the GEP Index is 2004-2019. A target, y^* , will be defined as $y^* = \lambda y^0$ (in the case of a "good" and if $\lambda y^0 > t$) and $y^* = \beta y^0$ (in the case of a "bad" and if $\beta y^0 < t$).

For a "good", the target of a country is calculated on the basis of the 10 per cent best performing countries in the distribution³⁰. In other words, a country should achieve a target that is based on an increase in y that is at least as good as the one achieved by the 10 per cent best performing countries in its relevant comparison group. Similarly, for a "bad", the target of the country is set to achieve a reduction as significant as the reduction of the 10 per cent best performing countries in the relevant comparison group³¹. In other words, a country should have as a target a reduction in y that is as big as the one achieved by the 10 per cent best performing countries in the relevant comparison group.

Thresholds are determined based on the data and internationally recognized scientific sources. For "goods" ("bads"), the value of the threshold is set at the value of the 25th (75th) percentile of the distribution in 2004. Countries should never go below (or above) the value achieved by the bottom 25 per cent (top 75 per cent) of countries in 2004 for this indicator. Internationally recognized scientific sources are used for environmental indicators, including recommendations on air pollution from the World Health Organization (WHO, 2014); on material footprint per capita from Stefan Bringezu (2015); and on protected areas from Aichi Biodiversity Targets (Leadly et. al., 2014).

Finally, to assess GEP within planetary boundaries, the progress achieved in the GEP Index indicators are compared to the progress made in the indicators of the Dashboard of Sustainability with the goal of highlighting whether planetary boundaries have been overstepped or not. It should be noted that the thresholds of indicators in the dashboard and of some indicators in the GEP Index are determined on the basis of scientific literature, while other thresholds in the GEP Index are empirically determined.

The calculations of targets and thresholds follows PAGE (2017b). For each footprint indicator, the **target** of the country is set to achieve a reduction as significant as the reduction of the 10 per cent best performing countries in the relevant comparison group. Table 2 shows the value of the **threshold** for carbon footprint, which was set to be exactly the same as for the case of production. For nitrogen emissions per capita, the threshold was determined following Nykvist et al., 2013. For the Inclusive Wealth Index, the threshold is zero (changes in values should be non-negative). For water stress and land-use related biodiversity are set at the value of the 75th percentile of the distribution in 2004, which is also the approached followed by PAGE (2017b) and Cabernard and Pfister (2021). This means the countries should never exceed the value achieved by the bottom 75% of all countries.³²

³⁰ For a "good", λ represents the ratio between the final (y^1) and initial (y^0) values for each indicator for the 90th percentile of the distribution. A country's target is calculated by multiplying its initial value with the λ of the 10 per cent best performing countries.

³¹ For a "bad", β represents the ratio between the final (y^1) and initial (y^0) values for each indicator for the 10th percentile of the distribution. A country's target is calculated by multiplying its initial value with the β of the 10 per cent best performing countries.

³² See Frischknecht et al. (2018) for thresholds for Environmental Footprints for Switzerland.

3. Results of the GEP Measurement Framework, 2004 - 2019

This section presents the results from the practical implementation of the GEP Measurement Framework methodology developed in UNEP (2017a), while using the set of indicators described on section 2. The section is structured as follows: Sections 3.1 and 3.2 present the results on Inclusive Green Economy progress in the single indicator case and in the multidimensional case using the GEP Index, and compare them with the results from PAGE (2017b). Finally, Section 3.4 shows the results for the progress made within planetary boundaries (GEP+); this is done by comparing the GEP Index results with the progress shown in the dashboard of indicators. We apply the same criteria as in PAGE (2017b), so to be included in the sample a country had to have data for 10 of the 13 GEP Index indicators and 3 of the 6 Dashboard of Sustainability indicators. Bear in mind, as discussed in Section 2.1, the two years considered in the GEP Index in this initial instance are 2004 and 2019, and the data is averaged over a five-year period around these years (2000-2004 and 2010-2019) due to data limitations. For the sake of simplification, the averaged data over 2000-2004 is referred to as “2004” and the averaged data over 2015-2019 is referred to as “2019” within this document.

3.1 Results for progress in the single indicator case (GEP Index)

Given data availability, it was possible to calculate progress for 13 indicators for the two data points of analysis, 2004 and 2019, for a total of 110 countries³³. Table 4 presents summary statistics for these 13 indicators of the GEP Index, see next section). **On average, progress by countries in the sample was highest on the indicators measuring energy use, life expectancy, gender inequality, access to basic services and education. On the other hand, material footprint experienced on average, the most significant regress.** The full results for the GEP index indicators are presented in Annex I.A.

Table 4: Progress on an Inclusive Green Economy by indicator – full sample

Variable	Obs	Mean	Std. Dev.	Min	Max
material footprint	106	-1.21	2.18	-12.08	2.55
air pollution	110	0.31	0.31	-0.23	1.07
protected areas	101	0.15	0.35	-0.04	2.44
energy use	104	0.50	0.44	-1.15	1.45
green trade	101	0.21	0.52	-0.21	3.89
green technology innovation	61	0.13	0.44	-0.52	2.46
renewable energy source	109	0.03	0.51	-1.71	1.85
Palma ratio	81	0.21	0.53	-1.51	1.26
gender inequality index	107	0.46	0.27	-0.04	1.06

³³ The total sample represents five more countries than UNEP (2017b). Also notice that for some indicators, cut-off values were used, for example for a country starting at a very high level and for which it is almost impossible to achieve further progress (e.g. a country with more than 97 per cent of access to basic services), or if the country started at a very low level for which achievements may be magnified because of data measurement problems (e.g. a country starting with 0.1 per cent access to basic services and that achieved a 0.2 per cent coverage). In these extreme cases, the value was substituted by a missing value for the corresponding indicator and progress was measured based on achievements in the remaining indicators.

access to basic services	94	0.46	0.31	-0.02	1.74
mean years of schooling	110	0.44	0.23	-0.03	1.40
pension coverage	85	0.24	1.31	-5.50	3.84
life expectancy	106	0.46	0.22	-0.01	1.13

Source: Author's calculations.

3.2 The GEP Index: measuring progress in the multidimensional case

A positive value of the GEP Index indicates progress (i.e. the weighted sum of positive changes in "goods" and negative changes in "bads" outweighs the weighted sum of negative changes in goods and positive changes in "bads"), while the opposite is true for a negative value. Table 5 presents a detailed summary of statistics for the GEP Index. Notice that more than 75 per cent of the sample of countries experienced progress, as indicated by positive values in green. The average country experienced progress, although there were some countries that experienced significant regress. The median value of the sample is 0.20, with the bottom 10 percentile having a value lower than -0.01, and the top 90 percentile having a value of 0.47. Figure 4 presents the kernel distributions of the GEP Index for the entire sample, comparing with the values of the GEP index for UNEP (2017b), while keeping the same sample of 105 countries. The figure shows that distribution of the GEP Index has moved towards the right, indicating that data that is more recent shows higher number of countries experiencing progress. In addition, the part of the distribution showing regress is smaller, while now there is a country for which progress is higher than one (Kenya, with a GEP Index of 1.57). In total, there are nine countries for which the GEP Index is higher than 0.55, which was the maximum value observed in PAGE (2017b). So, the update results reflect higher progress relative to what was achieved until 2014. The full results for the GEP index are presented in Annex I.B.

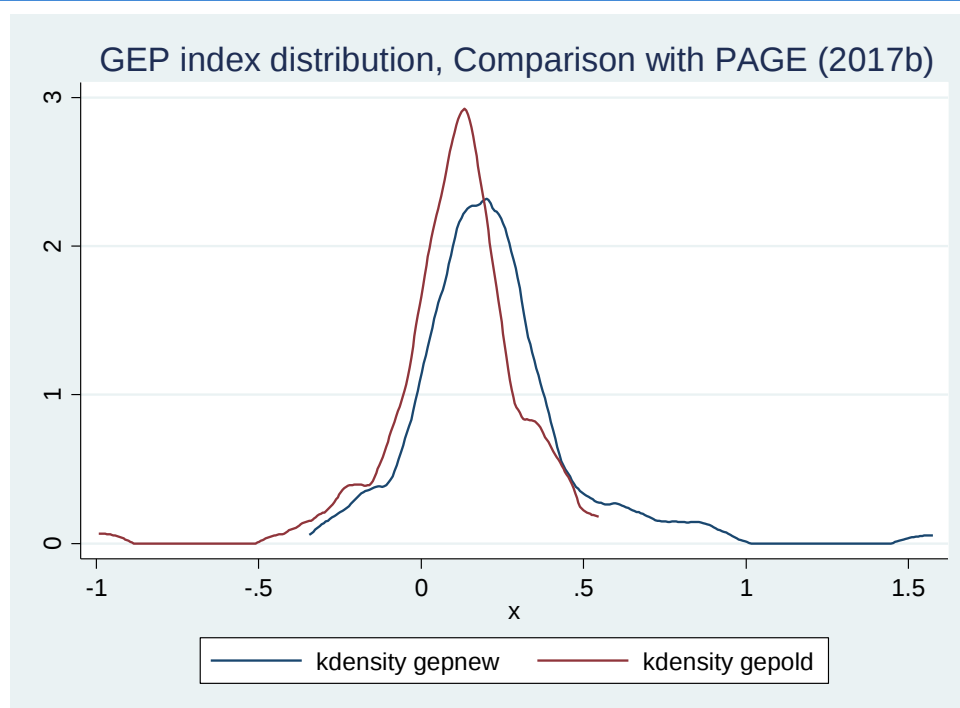
Table 5: Summary statistics of the GEP Index

Variable	Observations	Mean	Std. Dev.	Min	Max
GEP Index	110	0.22	0.25	-0.34	1.57

	1%	5%	10%	25%	50%	75%	90%	95%	99%
Percentiles	-0.22	-0.14	-0.01	0.09	0.20	0.31	0.47	0.67	0.89

Source: Author's calculations.

Figure 4: GEP Index (comparing with the GEP index of UNEP (2017b))



Source: Author's calculations.

Note: GEP new corresponds to the updated calculations, GEP old corresponds to PAGE (2017b).

Table 6-8 present the results for all HDI groups³⁴. The three tables below present the results for the entire sample of 110 countries, for the 99 countries with positive GEP Index values, and for the 11 countries with negative GEP Index values, respectively. These results cut by half the number of countries with regress compared to PAGE (2017b), which has 22 countries with negative GEP index.

Table 6: GEP Index by HDI groups (sample of 110 countries)

HDI group	Observations	Mean	Std. Dev.	Min	Max
Very high	49	0.22	0.23	-0.22	0.89
High	29	0.14	0.22	-0.34	0.79
Medium	19	0.28	0.33	0.01	1.57
Low	13	0.27	0.22	-0.03	0.69

Source: Author's calculations.

Table 7: GEP Index by HDI groups (sample of 99 countries with GEP Index positive)

HDI group	Observations	Mean	Std. Dev.	Min	Max
Very high	44	0.26	0.20	0.01	0.89
High	24	0.21	0.17	0.01	0.79
Medium	19	0.28	0.33	0.01	1.57
Low	12	0.30	0.21	0.03	0.69

Source: Author's calculations.

³⁴The sample of 110 countries with a value of the GEP index is divided across HDI groups as follows: 49 countries for Very High, 29 countries for High, 19 countries for Medium, and 13 countries for Low.

Table 8: GEP Index by HDI groups (sample of 11 countries with GEP Index negative)

<i>HDI group</i>	<i>Observations</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Very high	5	-0.14	0.08	-0.22	-0.03
High	5	-0.18	0.11	-0.34	-0.08
Medium	0				
Low	1	-0.03	.	-0.03	-0.03

Source: Author's calculations.

Note: The four categories of human development achievement used in Tables 6-8 are obtained using the cut-offs: 0.800 for Very High, 0.700 for High, and 0.550 for Medium. See UNDP (2020).

Tables 9-11 below present the results for the seven regions in which the sample of 110 countries is divided³⁵. Table 9 shows the results for the entire sample of 110 countries, Table 10 shows the results for the 99 countries with positive GEP Index value, while Table 11 shows the results for the 11 countries with negative GEP Index values.

Table 9: GEP Index by region (sample of 110 countries)

<i>Region</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
MENA	6	0.12	0.08	0.01	0.22
EAP	8	0.13	0.38	-0.34	0.79
ECA	13	0.11	0.24	-0.16	0.57
LAC	19	0.19	0.13	-0.21	0.31
South Asia	5	0.15	0.05	0.09	0.20
Sub-Saharan Africa	17	0.28	0.35	-0.03	1.57
Developed countries	42	0.27	0.23	-0.22	0.89

Source: Author's calculations.

Note: MENA: Middle East and North Africa; EAP: East Asia and the Pacific; ECA: Europe and Central Asia; LAC: Latin America and the Caribbean; "Developed" are all countries with very high HDI (> 0.8) that do not belong to any of these regions.

Table 10: GEP Index by regions (sample of 99 countries with GEP Index positive)

<i>Region</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
MENA	6	0.12	0.08	0.01	0.22
EAP	5	0.33	0.32	0.04	0.79
ECA	9	0.21	0.22	0.01	0.57
LAC	18	0.21	0.08	0.05	0.31
South Asia	5	0.15	0.05	0.09	0.20
Sub-Saharan Africa	16	0.30	0.36	0.07	1.57
Developed countries	40	0.29	0.22	0.01	0.89

Source: Author's calculations.

Note: MENA: Middle East and North Africa; EAP: East Asia and the Pacific; ECA: Europe and Central Asia; LAC: Latin America and the Caribbean; "Developed" are all countries with very high HDI (> 0.8) that do not belong to any of these regions.

³⁵ The sample of 110 countries with a value of the GEP index is divided across regions as follows: 6 countries for Middle East and North Africa; 8 countries for East Asia and the Pacific; 13 countries for Europe and Central Asia; 19 countries for Latin America and the Caribbean; 5 countries for South Asia; 17 countries for Sub-Saharan Africa; and 42 countries considered developed (all countries with HDI very high, greater than .8).

Table 11: GEP Index by regions (sample of 11 countries with GEP Index negative)

<i>Region</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
MENA	0				
EAP	3	-0.21	0.13	-0.34	-0.08
ECA	4	-0.13	0.02	-0.16	-0.11
LAC	1	-0.21	.	-0.21	-0.21
South Asia	0				
Sub-Saharan Africa	1	-0.03	.	-0.03	-0.03
Developed countries	2	-0.13	0.13	-0.22	-0.03

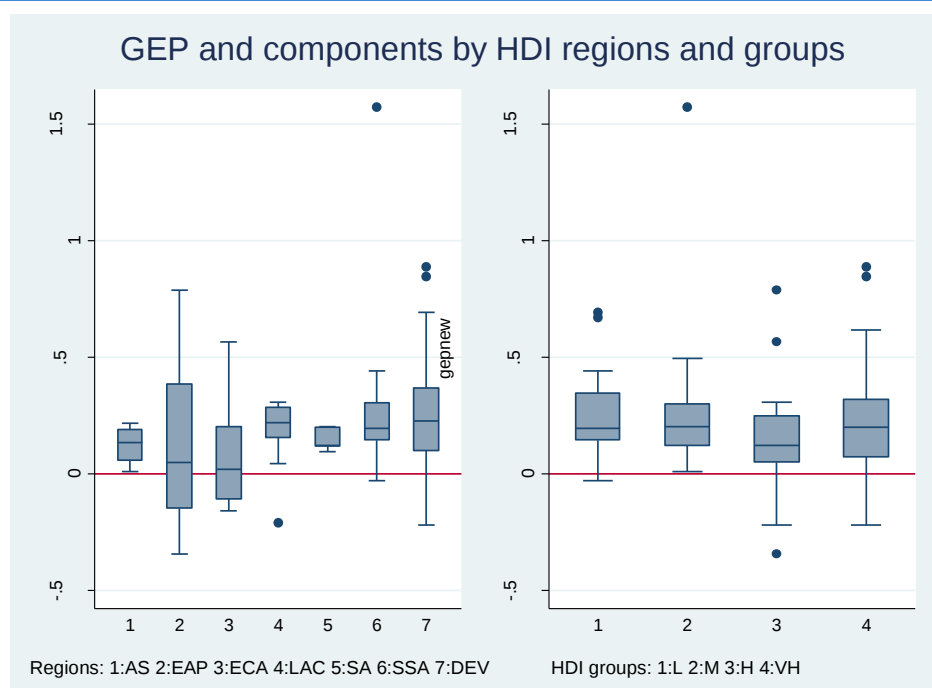
Source: Author's calculations.

Note: MENA: Middle East and North Africa; EAP: East Asia and the Pacific; ECA: Europe and Central Asia; LAC: Latin America and the Caribbean; "Developed" are all countries with very high HDI (> 0.8) that do not belong to any of these regions.

The results across development groups and geographical regions reveal important differences. The left figure in Figure 5 shows how results differ by region. East Asia and the Pacific, Europe and Central Asia are the regions where results are more mixed in terms of progress. East Asia and the Pacific is the region where most countries experienced regress (negative GEP Index). All South Asian and Middle East and North African countries experienced green economy progress (all of them have a positive GEP Index value). Most of countries in Latin America and the Caribbean, Sub-Saharan Africa, and the very high HDI countries have made green economy progress.

In terms of HDI group variations (see right figure of Figure 5), results are particularly mixed for the high HDI group, in which 50 per cent of countries show a regress (with an average value of - 0.13 for the countries experiencing regress and a median value for the group of 0.03). However, the majority of countries in the other HDI groups experienced progress: 34 out 37 countries in the very high HDI group, 18 out of 22 countries in the medium HDI group and almost all countries (17 out of 18) in the low HDI group (with median values of the GEP Index of 0.15, 0.13 and 0.14, respectively).

Figure 5: GEP Index results by regions and HDI groups



Source: Author's calculations.

Note: The four categories of human development achievement are obtained as the HDI values calculated using the cut-offs: 0.800 for Very High (VH), 0.700 for High (H), and 0.550 for Medium (M)³⁶.

3.3 Progress within planetary boundaries

This section presents progress in the dashboard indicators (using the same methodology used to measure progress for an individual indicator) for the 108 countries for which it was possible to calculate the GEP Index³⁷. The full results for the Dashboard indicators are presented in Annex I.C.

Table 12 shows that, on average, countries are experiencing regress in carbon footprint, water stress, emissions of nitrogen and the natural capital component of the Inclusive Wealth Index. The only two indicators for which the average of countries are making progress are the land-use related biodiversity loss and Inclusive Wealth Index, with average progress of 0.41 and 0.31 respectively. One striking result presented in Table 12 below is that, across all indicators, some countries are experiencing significant regress (progress lower than -1).

Table 12: Summary of dashboard indicators (sample of countries with GEP Index)

<i>Indicator</i>	<i>Obs.</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Carbon footprint short term (footprint)	108	-0.42	0.98	-4.89	2.76
Water stress (footprint)	108	-0.37	1.09	-4.60	1.88

³⁶ The last group is Low(L). The regions in Figure 2 are: 1) Middle East and North Africa; 2) East Asia and the Pacific; 3) Europe and Central Asia; 4) Latin America and the Caribbean; 5) South Asia; 6) Sub-Saharan Africa; and 7) All countries with HDI very high (HDI>0.8) that do not belong to any of these regions (UNDP, 2020).

³⁷ See Annex IV for complete results of the dashboard indicators for the 110 countries in the sample.

Land-use related biodiversity loss (footprint)	108	0.41	0.53	-1.68	1.38
Emissions of nitrogen	103	-0.26	1.31	-6.37	1.44
Inclusive Wealth Index	100	0.31	0.52	-1.11	1.84
Inclusive Wealth Index (Natural Capital)	100	-5.84	7.48	-26.41	5.21

Source: Author's calculations.

Table 13 shows that only 37 out of 108 countries (34 per cent) are making progress with respect to carbon footprint. Similarly, for water stress, only 47 (44 per cent) out of 108 countries are making progress. The only footprint indicator of the dashboard for which the number of countries making progress is greater than those making is land-use related biodiversity loss with 93 (86 per cent). For emissions of nitrogen 59 out of 103 countries (57 per cent) are experiencing progress (although the average progress is negative, as we saw on Table 12). For the Inclusive Wealth Index it is also true that there has been progress for the majority of countries 72 out of 100 countries (72 per cent). However, results show that the majority of countries are regressing in the natural capital component of the Inclusive Wealth Index (88 per cent).³⁸

Table 13: Number of countries making progress/regress in dashboard indicators

<i>Indicator</i>	<i>Obs.</i>	<i>Progress</i>	<i>Regress</i>
Carbon footprint short term (footprint)	108	37	71
Water stress (footprint)	108	47	61
Land-use related biodiversity loss (footprint)	108	93	15
Emissions of nitrogen	103	59	44
Inclusive Wealth Index	100	72	28
Inclusive Wealth Index (Natural Capital)	100	12	88

Source: Author's calculations.

3.3.1 Comparison of results with production side indicators

Table 14 shows the results for a subset of the dashboard indicators, comparing footprint (consumption) indicators compared with their production side counterpart. Notice that instead of using all the indicators from PAGE (2017b), this analysis only uses GHG emissions from the original framework and in addition uses the production side counterpart of our other two footprint indicators (water stress and Land-use related biodiversity loss).³⁹ Results shows clearly that there is a different picture when progress is assessed using footprint indicators, since for all indicators progress was substantially higher (or regress substantially lower) when measured with production side indicators instead of footprint indicators. Results are relatively similar only for Land-use related biodiversity loss.

³⁸ The IWI combines manufactured capital, human capital and natural capital, the latter of which is described in terms of sub-soil resources, ecosystems, and the atmosphere (UNU-IHDP/UNEP, 2014).

³⁹ These indicators have the same sources as the dashboard indicators described on section 2.2.

Table 14: Summary of dashboard (production and consumption) indicators (sample of countries with GEP Index)

<i>Indicator</i>	<i>Obs.</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Carbon footprint short term (Consumption)	108	-0.42	0.98	-4.89	2.76
Greenhouse gas emissions (Production)	110	-0.25	0.67	-3.24	1.38
Water stress (Consumption)	108	-0.37	1.09	-4.60	1.88
Water stress (Production)	108	0.26	0.60	-3.76	1.36
Land-use related biodiversity loss (Consumption)	108	0.41	0.53	-1.68	1.38
Land-use related biodiversity loss (Production)	108	0.40	0.44	-1.32	1.37

Source: Author's calculations.

Table 15 also shows that the number of countries making progress is greater using production side indicators than footprint indicators. The only exception was land-use related biodiversity loss, where the number of countries making progress is the same (although we saw on Table 14 that the average progress is smaller on the consumption side indicator).

Table 15: Number of countries making progress/regress in dashboard footprint indicators

<i>Indicator</i>	<i>Obs.</i>	<i>Progress</i>	<i>Regress</i>
Carbon footprint short term (Consumption)	108	37	71
Greenhouse gas emissions (Production)	110	44	66
Water stress (Consumption)	108	47	61
Water stress (Production)	108	85	23
Land-use related biodiversity loss (Consumption)	108	93	15
Land-use related biodiversity loss (Production)	108	96	12

Source: Author's calculations.

3.4 Overall country ranking (GEP+) using the GEP Index and the dashboard

Previous analysis showed the importance of incorporating footprint indicators to the analysis. This section discussed how its incorporation could be adapted to the final component of the GEP measurement framework, the GEP+. As discussed in PAGE (2017a), the Protective Criterion can be used to produce a ranking of all GEP Index-dashboard profiles, ranking countries according to their least-performing type of progress based on the principle of Priority to the Worst Achievement. This is done because from the strong sustainability approach does not make sense combine the GEP Index and dashboard information into a synthetic index, since this will imply that there is some degree of substitution among these set of indicators. However, having both

footprint and production side indicators in the Dashboard of sustainability requires additional steps to get the final ranking provided by the GEP+.

For this purpose, we allow for trade-offs across production and consumption considerations and construct an index across dashboard indicators using the GEP index methodology. Allowing trade-offs means that progress can be achieved by sufficiently improving one indicator to compensate for losses in another indicator. The application will allow for substitutability within each indicator between production-based and consumption-based indicators, but neither across other Dashboard indicators nor between these indicators and the GEP index. This approach will require first constructing a GEP index for carbon, water stress and land-use related biodiversity loss using the production and footprint indicators, creating a combined progress for each indicator. This is done by a weighted sum of progress across the production-based and the footprint indicator for each of the three indicators following the same methodology used to calculate the GEP index, as described in PAGE (2017a). Then, the combined progress for each dashboard indicator is compared to the GEP index when applying the Protective criterion to generate the GEP+. In annex III, we consider an alternative approach in which we prevent any substitutability across production-based and footprint indicators and apply the Protective criterion first within each indicator. That way, progress of that particular indicator will be the worst between either its production-based or footprint version. Annex III.B compares the results for both approaches, showing that our preferred approach creates similar results than the alternative approach.

3.4.1 GEP+ incorporating footprint indicators: Production and Consumption combined for each indicator

Results from the GEP Index and the three dashboard sustainability indicators using the main option (calculating an index using the GEP index methodology within each indicator) show that 30 countries in our sample (27.8%) were able to achieve positive progress (or no regress) in all the Dashboard of Sustainability indicators as well as a positive GEP Index score.⁴⁰ Table 16 presents the results for the top four countries per HDI group, showing how the Protective Criterion⁴¹ works in determining the ranking within each HDI group⁴². Comparison across countries however, seems to be more valid, when we concentrate the comparison among similar countries. Notice that for all HDI groups (except Low HDI for one country); all top countries have all indicators with progress. In the case of the Very High HDI group, Portugal has the highest rank.⁴³ In the case of the High HDI group, Botswana is the country with the highest ranking, having its lowest performance in water stress. For the Medium HDI group, Zimbabwe is the country with the highest ranking, with its lowest progress in water stress. Finally, for the Low HDI group, The Gambia is the top ranked country with its lowest progress was on water stress. When considering the entire sample of 108 countries, the combination of production and footprint indicators increases the role of the GEP index as a driver of the final ranking. This is reflecting the fact that by allowing some trade-off between production and consumption indicators in the dashboard, we get a less negative picture of progress in the dashboard of sustainability indicators. For 46.3%

⁴⁰ This represents 13 more countries than in the results presented on PAGE (2017b).

⁴¹ Notice that for the GEP+, the specific value of the worst performance is only used for creating the ranking according to the protective criterion, since this only has ordinal properties.

⁴² The 108 countries are distributed across HDI groups as follows: 48 Very High, 28 High, 19 Medium, and 13 Low.

⁴³ The ranking is based on the worst performance. In other words, the worst performance of Portugal was higher than any other worst performance for countries in the Very High HDI group. See Annex I.D for the complete set of results by each HDI group.

of countries (50 out of 108) experienced their worst performance in GHG emissions, 38.9% (42 out of 108) experienced their worst performance in water stress, 6.5% (7 out of 108) on land use related biodiversity loss, and 8.3% (9 out of 108) on the GEP index.

Table 16: Rank GEP Index-dashboard profiles using the Protective Criterion for GEP+ main Option (Top 4 countries per HDI group)

Rank	Country	Progress Greenhouse gas emissions	Progress Water stress	Progress Land Use related biodiversity loss	GEP Index	Worst performance (for Protective criterion)	HDI group
1	Portugal	1.1533	1.4616	0.5545	0.3960	0.3960	Very High
2	Spain	1.7580	2.2702	0.5920	0.3772	0.3772	Very High
3	Greece	2.2904	3.4458	0.3740	0.3943	0.3740	Very High
4	Italy	1.8726	0.9727	0.4454	0.3382	0.3382	Very High
1	Botswana	0.3206	0.3137	0.6798	0.4566	0.3137	High
2	Jordan	0.6112	1.2313	0.1123	0.1905	0.1123	High
3	Ukraine	0.7869	0.0359	0.0590	0.1261	0.0359	High
4	South Africa	0.0112	0.4294	1.4927	0.0742	0.0112	High
1	Zimbabwe	1.7442	0.1113	0.1592	0.2458	0.1113	Medium
2	Cameroon	1.1687	0.0235	0.3764	0.2280	0.0235	Medium
3	Zambia	0.4769	0.0204	0.2140	0.4963	0.0204	Medium
4	Namibia	0.0042	0.1589	2.0563	0.3261	0.0042	Medium
1	Gambia, The	0.2348	0.0498	0.1033	0.4350	0.0498	Low
2	Cote d'Ivoire	0.7078	0.0328	0.2509	0.0998	0.0328	Low
3	Yemen, Rep.	0.0258	1.0012	0.0958	0.4179	0.0258	Low
4	Ethiopia	0.1148	-0.0222	0.0657	2.8972	-0.0222	Low

Source: Author's calculations.

Note: Observations in bold indicate the minimum value among all categories. The ranking presented in this table is based on the following four categories: (a) the GEP Index; (b) greenhouse gas emissions; (c) water stress; and (d) land used related biodiversity loss. If the categories considered change, the ranking would vary as well. Note that each dashboard indicator is multiplied by its weight, while the GEP Index is multiplied by the average of the weights (see PAGE (2017b)).

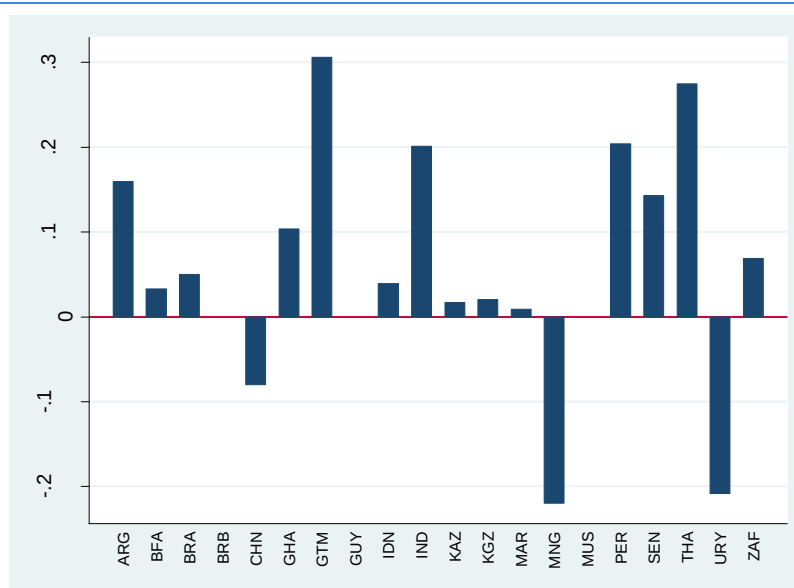
3.5 Results for PAGE countries

This section presents the results for the GEP Index and the GEP+ for the 20 PAGE countries.⁴⁴ Figure 6 presents the results for the GEP index results and its components for the PAGE countries (with a GEP index for 17 out of 20)⁴⁵ showing that 14 out of 17 countries have a positive GEP index, in other words, that they have made progress towards an Inclusive Green Economy. Notice that the highest value is 0.31 for Guatemala, indicating an overall achievement of less than a third of the initial targets. Table 17 shows that the only indicators for which all countries experienced progress were access to basic services, means years of education, and life expectancy. While the indicators where most countries (but not all) experienced regress were material footprint and renewable energy.

⁴⁴ The list of page countries and its Isocodes are as follows: Argentina (ARG); Barbados (BRB); Brazil (BRA); Burkina Faso (BFA); China (CHN); Ghana (GHA); Guatemala (GTM); Guyana (GUY); India (IND); Indonesia (IDN); Kazakhstan (KAZ); Kyrgyz Republic (KGZ); Mauritius (MUS); Mongolia (MNG); Morocco (MAR); Peru (PER); Senegal (SEN); South Africa (ZAF); Thailand (THA); and Uruguay (URY).

⁴⁵ There was not enough information to calculate the GEP index for Mauritius, Barbados and Guyana. However, we include all information available for these countries.

Figure 6: GEP Index results for PAGE countries



Source: Author's calculations.

Table 17: GEP Index and its components for PAGE countries

Country	material footprint	air pollution	protected areas	energy use	green trade	environmental patents	renewable energy	Palma ratio	gender inequality	access to basic services	mean years of schooling	pension coverage	life expectancy	GEP Index
Argentina	-0.51	0.43	0.03	0.37	-0.13	0.25	-0.05	1.04	0.16	0.99	0.28	0.64	0.23	0.16
Uruguay	-0.90	0.89		-0.13	-0.18		0.31	0.57	0.51		0.17	0.38	0.27	-0.21
Kazakhstan	-0.79	0.37	0.04	0.21	-0.01		-0.25	0.60	0.83	0.69	0.25		0.59	0.02
Mauritius	-0.20	0.18		0.45	0.02		-0.29		0.23		0.63		0.20	
Barbados	0.62	0.26			-0.03		-0.55		0.37		0.30	0.26	0.22	
South Africa	0.11	0.07	0.11	0.34	-0.08	-0.09	-0.04	-0.84	-0.02	0.44	0.38	0.40	0.48	0.07
Brazil	-1.01	0.48	0.19	0.02	-0.06	0.16	0.00	0.44	0.33	0.31	0.56	-0.36	0.37	0.05
Indonesia	-2.33	0.17	0.26	0.70	0.02	-0.09	-0.12	-0.66	0.31	0.84	0.26	0.22	0.42	0.04
Thailand	-1.26	0.21	0.03	-0.06	0.28		0.08	0.70	0.01	0.99	0.34	2.52	0.44	0.27
Peru	-0.82	0.24	0.31	0.19	0.24	0.55	-0.18	0.88	0.40	0.31	0.21	0.04	0.35	0.20
Mongolia	-12.08	-0.04	0.01	0.42	0.15		-0.31	-0.13	0.51	0.20	0.41	1.00	0.51	-0.22
China	-2.58	0.12	0.04	0.52	0.21	0.38	-0.38	0.28	0.59	0.57	0.34	1.00	0.36	-0.08
Ghana	-1.73	-0.01	0.00	0.89	0.24		-0.76		0.15	0.37	0.15	0.38	0.30	0.10
Guatemala	-0.29	0.32	0.01	-0.30	0.12	-0.06	0.09	0.57	0.26	0.32	1.40	0.14	0.42	0.31
India	-2.27	-0.08	0.00	0.46	0.13	-0.07	-0.30	-0.13	1.05	0.78	0.76	0.82	0.52	0.20
Morocco	-3.03	-0.06		0.10	0.14	-0.02	-0.24	0.02	0.44	0.33	0.93		0.52	0.01
Kyrgyz Republic	-1.07	0.21	-0.04	0.05			-0.19	0.15	0.50	0.39	0.23	1.00	0.23	0.02
Guyana	-0.17	0.26			-0.04		-0.29		0.13	0.60	0.13		0.32	
Senegal	-0.43	0.00	0.03	-0.10	-0.11		-0.04	0.31	0.30	0.25	0.30	0.43	0.43	0.14
Burkina Faso	-3.91	0.03			-0.07		-0.45	0.52	0.07	0.19	0.07	-0.02	0.53	0.03

Source: Author's calculations.

Table 18 presents the results from the GEP Index and the three dashboard sustainability indicators using the main option for PAGE countries showing that only South Africa was able to achieve positive progress (or no regress) in all the Dashboard of Sustainability indicators as well as a positive GEP Index score. In addition, Table 18 shows that for most PAGE countries the worst

performance occurs on greenhouse gasses emissions (except for Indonesia that happens on Land Use related biodiversity loss). This indicates that for PAGE countries the progress achieved in the GEP index may not be sustainable, given the regress on the dashboard sustainability indicators.

Table 18: Ranking of GEP Index-dashboard profiles using the Protective Criterion (GEP+) main Option, PAGE countries

<i>Country</i>	<i>Progress Greenhouse gas emissions</i>	<i>Progress Water stress</i>	<i>Progress Land Use related biodiversity loss</i>	<i>GEP Index</i>	<i>Worst performance (for Protective criterion)</i>	<i>HDI group</i>
Argentina	-0.36738	0.12334	0.06577	0.17554	-0.36738	Very High
Uruguay	-1.21149	-0.13519	-0.25558	-0.20417	-1.21149	Very High
Kazakhstan	-3.10650	0.23941	0.14956	0.02999	-3.10650	Very High
South Africa	0.01118	0.42941	1.49272	0.07418	0.01118	High
Brazil	-0.63976	-0.04219	1.18886	0.04234	-0.63976	High
Indonesia	-0.35209	-0.10789	-0.76837	0.03844	-0.76837	High
Thailand	-1.48839	0.03966	0.18406	0.28322	-1.48839	High
Peru	-1.86477	0.00310	0.45205	0.22955	-1.86477	High
Mongolia	-3.69624	-0.30692	1.02650	-0.35971	-3.69624	High
China	-4.44768	-1.05644	-0.04808	-0.11898	-4.44768	High
Ghana	-0.60769	0.04118	0.13065	0.13621	-0.60769	Medium
Guatemala	-0.60900	-0.02246	0.24615	0.30426	-0.60900	Medium
India	-1.21561	-0.24080	0.08427	0.36496	-1.21561	Medium
Morocco	-1.63583	0.97726	0.06915	0.00860	-1.63583	Medium
Kyrgyz Republic	-2.05403	0.55159	0.25221	0.01996	-2.05403	Medium
Senegal	-0.21826	-0.03589	0.06076	0.16467	-0.21826	Low
Burkina Faso	-0.53077	-0.01909	-0.00901	0.06089	-0.53077	Low

Source: Author's calculations.

Note: Observations in bold indicate the minimum value among all categories. The ranking presented in this table is based on the following four categories: (a) the GEP Index; (b) greenhouse gas emissions; (c) water stress; and (d) land used related biodiversity loss. If the categories considered change, the ranking would vary as well. Note that each dashboard indicator is multiplied by its weight, while the GEP Index is multiplied by the average of the weights (see PAGE (2017b)).

4. Final considerations

This publication presents an update to the application of the methodology at the global level with the latest data available. In addition, it introduces carbon, water stress, and land-use related biodiversity loss footprints to the dashboard of sustainability indicators of the GEP measurement framework, in particular. This is a critical addition to the GEP measurement framework because complex global value chains produce a large share of today's goods and services. This addition brings important considerations to the analysis and required important modifications to the Green Economy Progress Measurement Framework to incorporate them. As a robustness check, the report also presents in Annex III an alternative option and compare its results with the main alternative.

Data for the two of the environmental footprint indicators was provided by SCP-HAT, a tool to identify hotspots related to domestic pressures and impacts as well as the the impacts occurring in supply chains in foreign countries or linked to domestic consumption. Notice that for the interpretation of the results it has to be kept in mind that robustness of country information based on multi-regional input output tables (MRIOT) is decreasing with declining trade volumes and economic performance. Hence, continued improvement of underlying MRIOT data and country coverage is crucial for advising in measurement of footprint indicators.

The incorporation of footprint indicators increases the sample of countries for which we can have a GEP+ to 108. Results of incorporating the footprint indicate that 30 countries in our sample (27.8%) were able to achieve positive progress (or no regress) in all the Dashboard of Sustainability indicators as well as a positive GEP Index score. The two most important factors explaining the worst performance of countries are GHG emission with 46.3% of countries (50 out of 108) experienced their worst performance, and water stress where 38.9% (42 out of 108) experienced their worst performance. Comparison across countries however, seems to be more valid, when we concentrate the comparison among similar countries. Results for the GEP+ are presented for the top 4 countries per HDI group, showing how the Protective Criterion works in determining the ranking within each HDI group.

Results for the GEP index results and its components for the PAGE countries (with a GEP index for 17 out of 20) shows that 14 out 17 countries have a positive GEP index, in other words, that they have made progress towards an Inclusive Green Economy. However, when we use the information from the dashboard of sustainability indicators to calculate the GEP+, South Africa was the only country able to achieve positive progress (or no regress) in all the Dashboard of Sustainability indicators as well as a positive GEP Index score. This indicates that for PAGE countries the progress achieved in the GEP index may not be sustainable, given the regress on the dashboard sustainability indicators.

More generally, although the GEP Index results are encouraging, they nevertheless show the amount of effort that is still needed to ensure that improving human well-being does not come at the expense of key stocks of capital. Individual results on the Dashboard of Sustainability indicators reveal that countries are, on average, regressing in their sustainability indicators, i.e. they are surpassing planetary boundaries. There is a different picture when progress in the dashboard of sustainability indicators is assessed using footprint rather than production indicators, since for all indicators progress was substantially higher (or regress substantially

lower) when measured with production side indicators instead of footprint indicators (consumption side). The only indicator for which results are relatively similar from the production and consumption side is Land-use related biodiversity loss.

In Annex II, we present the results for the updated values of the indicators applied to the previous framework (see PAGE, 2017b). The update allows to expand the sample of countries, relative to PAGE (2017b), for which the GEP index is calculated from 105 to 110, and for which the GEP+ can be calculated from 100 to 102. Results show that in the update of information until 2019 reflect higher progress in the GEP index relative to what was achieved until 2014. The distribution of the GEP index has shifted to the right, not only because more countries are experiencing positive GEP index but also because they are also experiencing higher values. In addition, the number of countries having positive values in the GEP index and all the Dashboard sustainability indicators increase from 17 to 19.

In Annex III, a robustness check is presented with a more stringent alternative option, where the GEP+ is calculated by using the worst performance for each indicator between the production or consumption side. However, the effect on the final ranking of countries is still moderate, although with some variation. In fact, when we combine the entire sample the correlation between the GEP+ rank between the main option and the alternative option is 95.11. In addition, results show that most of countries preserve a similar ranking under either option. This implies that although different both options convey a similar message.

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ANNEX I – Statistical Annex: Results for the GEP Index, the Dashboard of Sustainability and the Protective Criterion

This Annex includes four parts. Part 1 presents results for each of the 13 indicators included in the GEP Index for the 110 countries in the sample. Part 2 presents results for each of the indicators included in the Dashboard of Sustainability for the 108 countries in the sample. Part 3 shows the values of the GEP Index for each of the 105 countries in the sample. Part 4 presents the overall ranking (GEP+) of the top 25 performing countries formed by using results from the GEP Index and three dashboard sustainability indicators (greenhouse gas emissions, nitrogen emissions, and land use). We encourage requests for ranking results and progress details of other countries in our sample from those who are interested. Please find the authors' contact details on the copyright page at the beginning of this document.

A. Indicators for the GEP Index

Material footprint per capita

Country	Current greenness			Progress of greenness					
	2000-2004 average value of material footprint = y^0	2015-2019 average value of material footprint = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	Weight π	progress on material footprint
Albania	7.00	10.72	5.00	0.25	0.04	5.00	1.40	0.12	-1.86
Algeria	3.66	6.59	5.00	0.20	0.05	3.00	0.73	0.05	-4.47
Angola	1.98	3.61	5.00	0.11	0.06	1.34	0.40	0.03	-2.59
Argentina	10.39	13.13	5.00	0.18	0.02	5.00	2.08	0.14	-0.51
Australia	37.57	44.20	5.00	0.44	0.01	5.00	7.51	0.53	-0.20
Austria	22.73	24.48	5.00	0.12	0.01	5.00	4.55	0.48	-0.10
Azerbaijan	2.53	6.92	5.00	0.29	0.12	2.07	0.51	0.04	-9.67
Bangladesh	1.57	2.10	5.00	0.03	0.02	1.07	0.31	0.02	-1.04
Belgium	18.07	18.96	5.00	0.06	0.00	5.00	3.61	0.28	-0.07
Benin	2.93	4.33	5.00	0.09	0.03	1.99	0.59	0.04	-1.49
Bolivia	4.52	6.51	5.00	0.13	0.03	3.71	0.90	0.09	-2.46
Brazil	11.61	18.30	5.00	0.45	0.04	5.00	2.32	0.21	-1.01
Bulgaria	6.16	12.14	5.00	0.40	0.06	5.00	1.23	0.10	-5.14
Cambodia	1.36	2.94	5.00	0.11	0.08	1.12	0.27	0.01	-6.45
Cameroon	1.82	2.23	5.00	0.03	0.01	1.24	0.36	0.02	-0.70
Canada	29.43	34.66	5.00	0.35	0.01	5.00	5.89	0.39	-0.21
Chile	18.93	20.52	5.00	0.11	0.01	5.00	3.79	0.29	-0.11
China	9.90	22.54	5.00	0.84	0.09	5.00	1.98	0.10	-2.58
Colombia	5.94	7.40	5.00	0.10	0.02	4.88	1.19	0.10	-1.36
Costa Rica	5.76	6.98	5.00	0.08	0.01	4.72	1.15	0.13	-1.18
Cote d'Ivoire	1.14	0.77	5.00	-0.02	-0.02	0.77	0.23	0.02	1.00

Croatia	12.74	12.43	5.00	-0.02	0.00	5.00	2.55	0.20	0.04
Cyprus	25.59	25.20	5.00	-0.03	0.00	5.00	5.12	0.31	0.02
Czech Republic	18.56	21.13	5.00	0.17	0.01	5.00	3.71	0.31	-0.19
Denmark	25.27	20.73	5.00	-0.30	-0.01	5.00	5.05	0.50	0.22
Dominican Republic	4.66	5.47	5.00	0.05	0.01	3.82	0.93	0.11	-0.97
Ecuador	6.73	9.44	5.00	0.18	0.03	5.00	1.35	0.12	-1.56
Egypt, Arab Rep.	5.20	6.10	5.00	0.06	0.01	4.27	1.04	0.06	-0.96
El Salvador	4.59	5.30	5.00	0.05	0.01	3.77	0.92	0.10	-0.86
Estonia	17.40	28.60	5.00	0.75	0.04	5.00	3.48	0.36	-0.90
Finland	35.46	34.64	5.00	-0.05	0.00	5.00	7.09	0.56	0.03
France	20.51	17.89	5.00	-0.18	-0.01	5.00	4.10	0.41	0.17
Georgia	3.96	7.11	5.00	0.21	0.05	3.25	0.79	0.06	-4.44
Germany	18.92	19.56	5.00	0.04	0.00	5.00	3.78	0.41	-0.05
Ghana	2.24	3.49	5.00	0.08	0.04	1.52	0.45	0.03	-1.73
Greece	30.69	19.06	5.00	-0.78	-0.03	5.00	6.14	0.42	0.45
Guatemala	3.63	3.83	5.00	0.01	0.00	2.98	0.73	0.06	-0.29
Honduras	3.22	3.79	5.00	0.04	0.01	2.64	0.64	0.04	-0.99
Hungary	14.59	14.55	5.00	0.00	0.00	5.00	2.92	0.23	0.00
India	3.38	4.75	5.00	0.09	0.03	2.77	0.68	0.03	-2.27
Indonesia	4.45	6.32	5.00	0.12	0.03	3.65	0.89	0.07	-2.33
Ireland	20.28	14.63	5.00	-0.38	-0.02	5.00	4.06	0.09	0.37
Israel	18.10	14.93	5.00	-0.21	-0.01	5.00	3.62	0.31	0.24
Italy	19.25	16.00	5.00	-0.22	-0.01	5.00	3.85	0.30	0.23
Jamaica	8.95	7.89	5.00	-0.07	-0.01	5.00	1.79	0.18	0.27
Japan	21.06	19.40	5.00	-0.11	-0.01	5.00	4.21	0.39	0.10
Jordan	8.21	7.27	5.00	-0.06	-0.01	5.00	1.64	0.13	0.29
Kazakhstan	13.60	20.41	5.00	0.45	0.03	5.00	2.72	0.14	-0.79
Kenya	2.80	3.22	5.00	0.03	0.01	1.90	0.56	0.03	-0.47
Korea, Rep.	21.78	20.31	5.00	-0.10	0.00	5.00	4.36	0.21	0.09
Kyrgyz Republic	6.60	8.31	5.00	0.11	0.02	5.00	1.32	0.12	-1.07
Latvia	9.35	20.29	5.00	0.73	0.08	5.00	1.87	0.20	-2.52
Lithuania	14.61	25.53	5.00	0.73	0.05	5.00	2.92	0.29	-1.14
Luxembourg	45.63	56.05	5.00	0.69	0.02	5.00	9.13	0.60	-0.26
Malawi	1.18	1.21	5.00	0.00	0.00	0.80	0.24	0.02	-0.08
Malaysia	15.63	19.66	5.00	0.27	0.02	5.00	3.13	0.22	-0.38
Mali	3.00	4.58	5.00	0.11	0.04	2.04	0.60	0.02	-1.64
Mexico	9.65	9.55	5.00	-0.01	0.00	5.00	1.93	0.15	0.02
Mongolia	2.88	9.12	5.00	0.42	0.14	2.36	0.58	0.03	-12.08
Morocco	3.55	5.49	5.00	0.13	0.04	2.92	0.71	0.07	-3.03
Mozambique	1.71	2.12	5.00	0.03	0.02	1.16	0.34	0.02	-0.74
Namibia	9.85	8.99	5.00	-0.06	-0.01	5.00	1.97	0.15	0.18
Nepal	1.65	2.73	5.00	0.07	0.04	1.12	0.33	0.02	-2.05
Netherlands	20.16	17.90	5.00	-0.15	-0.01	5.00	4.03	0.36	0.15
New Zealand	23.51	23.48	5.00	0.00	0.00	5.00	4.70	0.45	0.00
Nicaragua	3.29	4.12	5.00	0.06	0.02	2.70	0.66	0.06	-1.41
Norway	32.64	39.56	5.00	0.46	0.01	5.00	6.53	0.40	-0.25
Pakistan	2.51	3.05	5.00	0.04	0.01	1.71	0.50	0.03	-0.66
Panama	6.58	7.12	5.00	0.04	0.01	5.00	1.32	0.13	-0.34
Paraguay	8.50	13.14	5.00	0.31	0.04	5.00	1.70	0.08	-1.33
Peru	8.52	11.42	5.00	0.19	0.02	5.00	1.70	0.12	-0.82

Philippines	3.66	4.04	5.00	0.02	0.01	3.00	0.73	0.02	-0.57
Poland	13.81	18.23	5.00	0.29	0.02	5.00	2.76	0.25	-0.50
Portugal	23.50	16.66	5.00	-0.46	-0.02	5.00	4.70	0.37	0.37
Russian Federation	7.71	11.92	5.00	0.28	0.04	5.00	1.54	0.13	-1.55
Senegal	2.46	2.79	5.00	0.02	0.01	1.67	0.49	0.04	-0.43
Singapore	34.60	40.55	5.00	0.40	0.01	5.00	6.92	0.25	-0.20
Slovak Republic	22.09	31.50	5.00	0.63	0.03	5.00	4.42	0.34	-0.55
Slovenia	18.75	17.76	5.00	-0.07	0.00	5.00	3.75	0.32	0.07
South Africa	8.84	8.40	5.00	-0.03	0.00	5.00	1.77	0.13	0.11
Spain	25.91	19.27	5.00	-0.44	-0.02	5.00	5.18	0.49	0.32
Sri Lanka	1.84	4.05	5.00	0.15	0.08	1.51	0.37	0.03	-6.66
Sweden	22.41	22.96	5.00	0.04	0.00	5.00	4.48	0.47	-0.03
Switzerland	24.35	29.54	5.00	0.35	0.01	5.00	4.87	0.49	-0.27
Thailand	8.05	11.90	5.00	0.26	0.03	5.00	1.61	0.13	-1.26
Togo	2.22	2.93	5.00	0.05	0.02	1.51	0.44	0.03	-0.99
Tunisia	6.73	8.25	5.00	0.10	0.02	5.00	1.35	0.07	-0.88
Turkey	9.63	19.18	5.00	0.64	0.07	5.00	1.93	0.11	-2.06
Uganda	2.33	2.45	5.00	0.01	0.00	1.59	0.47	0.02	-0.15
Ukraine	6.85	13.75	5.00	0.46	0.07	5.00	1.37	0.08	-3.73
United Kingdom	19.36	15.17	5.00	-0.28	-0.01	5.00	3.87	0.24	0.29
United States	33.37	26.40	5.00	-0.46	-0.01	5.00	6.67	0.49	0.25
Uruguay	22.72	38.68	5.00	1.06	0.05	5.00	4.54	0.46	-0.90
Venezuela, RB	7.35	7.37	5.00	0.00	0.00	5.00	1.47	0.15	-0.01
Vietnam	4.91	12.07	5.00	0.48	0.10	4.03	0.98	0.07	-8.12
Yemen, Rep.	1.73	1.85	5.00	0.01	0.00	1.17	0.35	0.01	-0.22
Zambia	3.05	3.81	5.00	0.05	0.02	2.07	0.61	0.04	-0.78
Zimbabwe	1.64	0.30	5.00	-0.09	-0.05	1.12	0.33	0.03	2.55

Source: Authors' calculations.

Air pollution

Country	Current greenness			Progress of greenness					
	2000-2004 average value of air pollution = y^0	2015-2019 average value of air pollution = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	Weight π	progress on air pollution
Albania	22.00	18.63	10.00	-0.22	-0.01	10.00	2.20	0.19	0.28
Algeria	37.54	38.28	10.00	0.05	0.00	10.00	3.75	0.25	-0.03
Angola	36.18	32.30	10.00	-0.26	-0.01	10.00	3.62	0.30	0.15
Argentina	16.78	13.90	10.00	-0.19	-0.01	10.00	1.68	0.12	0.43
Australia	10.84	8.83	10.00	-0.13	-0.01	8.82	1.08	0.08	1.00
Austria	15.36	12.87	10.00	-0.17	-0.01	10.00	1.54	0.16	0.46
Azerbaijan	22.88	20.52	10.00	-0.16	-0.01	10.00	2.29	0.18	0.18
Bangladesh	63.04	62.65	10.00	-0.03	0.00	10.00	6.30	0.35	0.01
Belarus	22.65	19.24	10.00	-0.23	-0.01	10.00	2.27	0.23	0.27
Belgium	15.66	13.10	10.00	-0.17	-0.01	10.00	1.57	0.12	0.45
Benin	39.78	39.31	10.00	-0.03	0.00	10.00	3.98	0.30	0.02
Bolivia	26.25	21.81	10.00	-0.30	-0.01	10.00	2.63	0.25	0.27
Brazil	15.77	12.99	10.00	-0.19	-0.01	10.00	1.58	0.14	0.48
Bulgaria	24.09	19.74	10.00	-0.29	-0.01	10.00	2.41	0.19	0.31
Cambodia	29.97	25.86	10.00	-0.27	-0.01	10.00	3.00	0.12	0.21
Cameroon	70.83	74.35	10.00	0.23	0.00	10.00	7.08	0.38	-0.06
Canada	8.28	6.71	10.00	-0.10	-0.01	6.74	0.83	0.06	1.02
Chile	26.17	21.49	10.00	-0.31	-0.01	10.00	2.62	0.20	0.29
China	60.70	54.65	10.00	-0.40	-0.01	10.00	6.07	0.31	0.12
Colombia	20.05	16.80	10.00	-0.22	-0.01	10.00	2.01	0.17	0.32
Costa Rica	19.41	16.09	10.00	-0.22	-0.01	10.00	1.94	0.22	0.35
Cote d'Ivoire	25.26	26.75	10.00	0.10	0.00	10.00	2.53	0.20	-0.10
Croatia	21.51	18.30	10.00	-0.21	-0.01	10.00	2.15	0.16	0.28
Cyprus	20.18	17.78	10.00	-0.16	-0.01	10.00	2.02	0.12	0.24
Czech Republic	20.44	16.53	10.00	-0.26	-0.01	10.00	2.04	0.17	0.37
Denmark	12.42	10.26	10.00	-0.14	-0.01	10.00	1.24	0.12	0.89
Dominican Republic	16.45	14.09	10.00	-0.16	-0.01	10.00	1.65	0.20	0.37
Ecuador	18.70	15.19	10.00	-0.23	-0.01	10.00	1.87	0.17	0.40
Egypt, Arab Rep.	73.26	87.79	10.00	0.97	0.01	10.00	7.33	0.42	-0.23
El Salvador	31.85	25.23	10.00	-0.44	-0.01	10.00	3.19	0.34	0.30
Estonia	8.23	6.85	10.00	-0.09	-0.01	6.69	0.82	0.09	0.90
Finland	7.09	5.94	10.00	-0.08	-0.01	5.77	0.71	0.06	0.87
France	14.72	12.14	10.00	-0.17	-0.01	10.00	1.47	0.15	0.55
Georgia	25.27	22.76	10.00	-0.17	-0.01	10.00	2.53	0.19	0.16
Germany	14.90	12.26	10.00	-0.18	-0.01	10.00	1.49	0.16	0.54
Ghana	35.04	35.22	10.00	0.01	0.00	10.00	3.50	0.24	-0.01
Greece	19.92	16.76	10.00	-0.21	-0.01	10.00	1.99	0.14	0.32
Guatemala	31.06	24.31	10.00	-0.45	-0.01	10.00	3.11	0.24	0.32
Honduras	27.57	21.37	10.00	-0.41	-0.01	10.00	2.76	0.15	0.35
Hungary	18.98	16.35	10.00	-0.18	-0.01	10.00	1.90	0.15	0.29

India	84.16	89.95	10.00	0.39	0.00	10.00	8.42	0.36	-0.08
Indonesia	17.88	16.51	10.00	-0.09	-0.01	10.00	1.79	0.14	0.17
Ireland	10.14	8.39	10.00	-0.12	-0.01	8.25	1.01	0.02	0.93
Israel	24.50	21.64	10.00	-0.19	-0.01	10.00	2.45	0.21	0.20
Italy	19.78	17.04	10.00	-0.18	-0.01	10.00	1.98	0.16	0.28
Jamaica	15.89	13.66	10.00	-0.15	-0.01	10.00	1.59	0.16	0.38
Japan	14.21	12.01	10.00	-0.15	-0.01	10.00	1.42	0.13	0.52
Jordan	33.51	33.50	10.00	0.00	0.00	10.00	3.35	0.26	0.00
Kazakhstan	15.94	13.76	10.00	-0.15	-0.01	10.00	1.59	0.08	0.37
Kenya	28.39	28.57	10.00	0.01	0.00	10.00	2.84	0.17	-0.01
Korea, Rep.	29.77	26.12	10.00	-0.24	-0.01	10.00	2.98	0.14	0.18
Kyrgyz Republic	27.08	23.43	10.00	-0.24	-0.01	10.00	2.71	0.25	0.21
Latvia	16.72	13.61	10.00	-0.21	-0.01	10.00	1.67	0.18	0.46
Lithuania	14.43	12.04	10.00	-0.16	-0.01	10.00	1.44	0.14	0.54
Luxembourg	12.57	10.56	10.00	-0.13	-0.01	10.00	1.26	0.08	0.78
Malawi	26.14	23.73	10.00	-0.16	-0.01	10.00	2.61	0.21	0.15
Malaysia	18.08	16.41	10.00	-0.11	-0.01	10.00	1.81	0.13	0.21
Mali	39.80	39.64	10.00	-0.01	0.00	10.00	3.98	0.16	0.01
Mexico	26.78	21.25	10.00	-0.37	-0.01	10.00	2.68	0.21	0.33
Moldova	19.58	16.56	10.00	-0.20	-0.01	10.00	1.96	0.25	0.31
Mongolia	39.03	40.28	10.00	0.08	0.00	10.00	3.90	0.20	-0.04
Morocco	30.97	32.32	10.00	0.09	0.00	10.00	3.10	0.30	-0.06
Mozambique	22.69	21.56	10.00	-0.08	0.00	10.00	2.27	0.14	0.09
Namibia	27.43	25.94	10.00	-0.10	0.00	10.00	2.74	0.21	0.09
Nepal	88.94	98.01	10.00	0.60	0.01	10.00	8.89	0.50	-0.11
Netherlands	14.93	12.33	10.00	-0.17	-0.01	10.00	1.49	0.13	0.53
New Zealand	7.16	6.09	10.00	-0.07	-0.01	5.83	0.72	0.07	0.80
Nicaragua	23.05	17.97	10.00	-0.34	-0.01	10.00	2.31	0.21	0.39
Norway	8.67	7.05	10.00	-0.11	-0.01	7.05	0.87	0.05	1.00
Pakistan	61.11	59.00	10.00	-0.14	0.00	10.00	6.11	0.31	0.04
Panama	14.38	11.79	10.00	-0.17	-0.01	10.00	1.44	0.14	0.59
Paraguay	14.21	12.20	10.00	-0.13	-0.01	10.00	1.42	0.07	0.48
Peru	30.27	25.46	10.00	-0.32	-0.01	10.00	3.03	0.21	0.24
Philippines	22.20	18.63	10.00	-0.24	-0.01	10.00	2.22	0.05	0.29
Poland	25.82	21.51	10.00	-0.29	-0.01	10.00	2.58	0.23	0.27
Portugal	10.12	8.35	10.00	-0.12	-0.01	8.24	1.01	0.08	0.94
Russian Federation	19.05	16.47	10.00	-0.17	-0.01	10.00	1.91	0.16	0.29
Senegal	41.35	41.24	10.00	-0.01	0.00	10.00	4.14	0.30	0.00
Singapore	19.32	19.51	10.00	0.01	0.00	10.00	1.93	0.07	-0.02
Slovak Republic	21.72	17.91	10.00	-0.25	-0.01	10.00	2.17	0.16	0.33
Slovenia	19.13	16.35	10.00	-0.19	-0.01	10.00	1.91	0.16	0.30
South Africa	26.67	25.45	10.00	-0.08	0.00	10.00	2.67	0.19	0.07
Spain	11.77	9.95	10.00	-0.12	-0.01	9.58	1.18	0.11	0.83
Sri Lanka	30.86	16.82	10.00	-0.94	-0.03	10.00	3.09	0.24	0.67
Sweden	7.58	6.21	10.00	-0.09	-0.01	6.17	0.76	0.08	0.97
Switzerland	12.69	10.60	10.00	-0.14	-0.01	10.00	1.27	0.13	0.78
Tajikistan	51.18	45.77	10.00	-0.36	-0.01	10.00	5.12	0.30	0.13
Thailand	30.96	26.62	10.00	-0.29	-0.01	10.00	3.10	0.25	0.21
Togo	37.69	37.05	10.00	-0.04	0.00	10.00	3.77	0.25	0.02
Tunisia	35.60	37.47	10.00	0.12	0.00	10.00	3.56	0.19	-0.07

Turkey	42.69	44.73	10.00	0.14	0.00	10.00	4.27	0.23	-0.06
Uganda	46.03	50.46	10.00	0.30	0.01	10.00	4.60	0.24	-0.12
Ukraine	24.16	20.72	10.00	-0.23	-0.01	10.00	2.42	0.14	0.24
United Kingdom	12.62	10.58	10.00	-0.14	-0.01	10.00	1.26	0.08	0.78
United States	9.53	7.63	10.00	-0.13	-0.01	7.75	0.95	0.07	1.07
Uruguay	11.37	9.38	10.00	-0.13	-0.01	9.13	1.14	0.12	0.89
Venezuela, RB	21.61	17.36	10.00	-0.28	-0.01	10.00	2.16	0.22	0.37
Vietnam	36.24	30.78	10.00	-0.36	-0.01	10.00	3.62	0.26	0.21
Yemen, Rep.	50.87	51.61	10.00	0.05	0.00	10.00	5.09	0.21	-0.02
Zambia	30.90	27.72	10.00	-0.21	-0.01	10.00	3.09	0.18	0.15
Zimbabwe	23.13	21.90	10.00	-0.08	0.00	10.00	2.31	0.19	0.09
Albania	22.00	18.63	10.00	-0.22	-0.01	10.00	2.20	0.19	0.28

Source: Authors' calculations.

Energy use

Country	Current greenness			Progress of greenness					
	2000-2004 average value of energy use = y^0	2015-2019 average value of energy use = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	Weight π	progress on energy use
Albania	92.85	66.34	161.46	-2.65	-0.03	61.03	0.58	0.05	0.83
Algeria	99.09	109.65	161.46	1.06	0.01	65.14	0.61	0.04	-0.31
Angola	89.17	67.22	161.46	-2.20	-0.02	58.62	0.55	0.05	0.72
Argentina	93.52	81.65	161.46	-1.19	-0.01	61.48	0.58	0.04	0.37
Australia	139.34	114.20	161.46	-1.68	-0.01	91.59	0.86	0.06	0.53
Austria	80.04	71.48	161.46	-0.57	-0.01	52.62	0.50	0.05	0.31
Azerbaijan	301.61	98.89	161.46	-20.27	-0.07	161.46	1.87	0.14	1.45
Bangladesh	75.30	68.40	161.46	-0.69	-0.01	49.50	0.47	0.03	0.27
Belarus	282.23	163.62	161.46	-11.86	-0.04	161.46	1.75	0.17	0.98
Belgium	126.69	94.72	161.46	-2.13	-0.02	83.28	0.78	0.06	0.74
Benin	120.13	143.89	161.46	2.38	0.02	78.97	0.74	0.06	-0.58
Bolivia	95.48	99.69	161.46	0.42	0.00	62.76	0.59	0.06	-0.13
Brazil	92.66	91.89	161.46	-0.08	0.00	60.91	0.57	0.05	0.02
Bulgaria	207.72	136.61	161.46	-7.11	-0.03	136.55	1.29	0.10	1.00
Cambodia	175.16	129.40	161.46	-4.58	-0.03	115.15	1.08	0.04	0.76
Cameroon	141.48	103.14	161.46	-3.83	-0.03	93.00	0.88	0.05	0.79
Canada	212.72	159.75	161.46	-3.53	-0.02	139.83	1.32	0.09	0.73
Chile	103.04	84.86	161.46	-1.21	-0.01	67.73	0.64	0.05	0.51
China	254.55	205.78	161.46	-4.88	-0.02	161.46	1.58	0.08	0.52
Colombia	67.31	54.05	161.46	-1.33	-0.02	44.25	0.42	0.04	0.57
Costa Rica	61.76	60.41	161.46	-0.13	0.00	40.60	0.38	0.04	0.06
Cote d'Ivoire	108.83	151.89	161.46	4.31	0.04	71.54	0.67	0.05	-1.15
Croatia	102.41	85.78	161.46	-1.66	-0.02	67.32	0.63	0.05	0.47
Cyprus	88.91	72.21	161.46	-1.67	-0.02	58.44	0.55	0.03	0.55
Czech Republic	158.30	106.73	161.46	-3.44	-0.02	104.06	0.98	0.08	0.95
Denmark	72.45	53.12	161.46	-1.29	-0.02	47.63	0.45	0.04	0.78
Dominican Republic	84.90	57.95	161.46	-2.70	-0.03	55.81	0.53	0.06	0.93
Ecuador	81.03	72.96	161.46	-0.81	-0.01	53.26	0.50	0.05	0.29
Egypt, Arab Rep.	82.51	84.50	161.46	0.20	0.00	54.24	0.51	0.03	-0.07
El Salvador	107.00	86.76	161.46	-2.02	-0.02	70.34	0.66	0.07	0.55
Estonia	175.83	133.72	161.46	-2.81	-0.02	115.58	1.09	0.11	0.70
Finland	161.46	131.45	161.46	-2.00	-0.01	106.14	1.00	0.08	0.54
France	104.32	84.77	161.46	-1.30	-0.01	68.58	0.65	0.06	0.55
Georgia	119.34	89.55	161.46	-2.98	-0.02	78.45	0.74	0.06	0.73
Germany	95.30	74.55	161.46	-1.38	-0.01	62.64	0.59	0.06	0.64
Ghana	107.04	74.52	161.46	-3.25	-0.03	70.37	0.66	0.05	0.89
Greece	82.11	76.47	161.46	-0.38	0.00	53.98	0.51	0.03	0.20
Guatemala	92.13	101.69	161.46	0.96	0.01	60.56	0.57	0.04	-0.30
Honduras	117.54	116.25	161.46	-0.13	0.00	77.27	0.73	0.04	0.03
Hungary	118.27	88.33	161.46	-2.00	-0.02	77.75	0.73	0.06	0.74

India	153.32	129.21	161.46	-2.41	-0.02	100.79	0.95	0.04	0.46
Indonesia	125.67	95.47	161.46	-3.02	-0.02	82.61	0.78	0.06	0.70
Ireland	70.48	39.58	161.46	-2.06	-0.03	46.33	0.44	0.01	1.28
Israel	94.61	73.81	161.46	-1.39	-0.01	62.19	0.59	0.05	0.64
Italy	70.10	61.36	161.46	-0.58	-0.01	46.08	0.43	0.03	0.36
Jamaica	144.88	104.04	161.46	-4.08	-0.03	95.24	0.90	0.09	0.82
Japan	112.13	86.42	161.46	-1.71	-0.02	73.71	0.69	0.06	0.67
Jordan	106.62	88.85	161.46	-1.78	-0.02	70.09	0.66	0.05	0.49
Kazakhstan	214.02	198.86	161.46	-1.52	-0.01	140.69	1.33	0.07	0.21
Kenya	150.15	133.94	161.46	-1.62	-0.01	98.70	0.93	0.05	0.32
Korea, Rep.	164.77	139.27	161.46	-1.70	-0.01	108.32	1.02	0.05	0.45
Kyrgyz Republic	146.67	144.08	161.46	-0.26	0.00	96.41	0.91	0.08	0.05
Latvia	118.91	91.44	161.46	-2.75	-0.02	78.17	0.74	0.08	0.67
Lithuania	152.36	87.97	161.46	-6.44	-0.04	100.16	0.94	0.09	1.23
Luxembourg	83.89	59.02	161.46	-1.66	-0.02	55.15	0.52	0.03	0.87
Malaysia	135.44	125.81	161.46	-0.96	-0.01	89.03	0.84	0.06	0.21
Mexico	89.34	79.70	161.46	-0.64	-0.01	58.73	0.55	0.04	0.31
Moldova	186.04	126.16	161.46	-5.99	-0.03	122.29	1.15	0.15	0.94
Mongolia	209.37	178.97	161.46	-3.04	-0.01	137.63	1.30	0.07	0.42
Morocco	85.05	82.06	161.46	-0.30	0.00	55.91	0.53	0.05	0.10
Mozambique	576.96	384.14	161.46	-19.28	-0.03	161.46	3.57	0.21	0.46
Namibia	88.39	79.59	161.46	-0.88	-0.01	58.10	0.55	0.04	0.29
Nepal	184.01	155.47	161.46	-2.85	-0.02	120.96	1.14	0.06	0.45
Netherlands	101.87	79.53	161.46	-1.49	-0.01	66.96	0.63	0.06	0.64
New Zealand	126.98	109.84	161.46	-1.14	-0.01	83.47	0.79	0.08	0.39
Nicaragua	124.90	109.01	161.46	-1.59	-0.01	82.10	0.77	0.07	0.37
Norway	100.68	93.99	161.46	-0.45	0.00	66.18	0.62	0.04	0.19
Pakistan	134.80	116.16	161.46	-1.86	-0.01	88.61	0.83	0.04	0.40
Panama	58.13	42.55	161.46	-1.56	-0.03	38.21	0.36	0.03	0.78
Paraguay	84.93	71.02	161.46	-1.39	-0.02	55.83	0.53	0.03	0.48
Peru	66.80	62.39	161.46	-0.44	-0.01	43.91	0.41	0.03	0.19
Philippines	103.94	69.82	161.46	-3.41	-0.03	68.33	0.64	0.01	0.96
Poland	138.01	89.35	161.46	-3.24	-0.02	90.73	0.85	0.08	1.03
Portugal	78.99	68.42	161.46	-0.70	-0.01	51.92	0.49	0.04	0.39
Russian Federation	265.04	195.83	161.46	-6.92	-0.03	161.46	1.64	0.14	0.67
Senegal	102.13	105.67	161.46	0.35	0.00	67.14	0.63	0.05	-0.10
Singapore	98.04	60.14	161.46	-3.79	-0.04	64.45	0.61	0.02	1.13
Slovak Republic	195.64	101.98	161.46	-6.24	-0.03	128.61	1.21	0.09	1.40
Slovenia	121.26	93.52	161.46	-1.85	-0.02	79.71	0.75	0.06	0.67
South Africa	238.47	211.08	161.46	-2.74	-0.01	156.76	1.48	0.11	0.34
Spain	85.85	68.66	161.46	-1.15	-0.01	56.44	0.53	0.05	0.58
Sri Lanka	71.98	49.15	161.46	-2.28	-0.03	47.32	0.45	0.03	0.93
Sweden	132.57	98.69	161.46	-2.26	-0.02	87.15	0.82	0.09	0.75
Switzerland	60.49	44.74	161.46	-1.05	-0.02	39.76	0.37	0.04	0.76
Tajikistan	231.74	122.98	161.46	-10.88	-0.05	152.34	1.44	0.08	1.37
Thailand	120.29	122.59	161.46	0.23	0.00	79.08	0.75	0.06	-0.06
Togo	331.12	357.77	161.46	2.67	0.01	161.46	2.05	0.14	-0.16
Tunisia	103.12	92.94	161.46	-1.02	-0.01	67.79	0.64	0.03	0.29
Turkey	75.26	63.48	161.46	-0.79	-0.01	49.47	0.47	0.03	0.46
Ukraine	333.07	216.63	161.46	-11.64	-0.03	161.46	2.06	0.12	0.68

United Kingdom	93.64	61.55	161.46	-2.14	-0.02	61.55	0.58	0.04	1.00
United States	154.08	116.27	161.46	-2.52	-0.02	101.29	0.95	0.07	0.72
Uruguay	66.37	69.22	161.46	0.28	0.00	43.63	0.41	0.04	-0.13
Vietnam	123.94	122.16	161.46	-0.18	0.00	81.47	0.77	0.05	0.04
Zambia	288.47	191.33	161.46	-9.71	-0.03	161.46	1.79	0.10	0.76
Zimbabwe	268.32	301.90	161.46	3.36	0.01	161.46	1.66	0.14	-0.31

Source: Authors' calculations.

Green trade

Country	Current greenness			Progress of greenness					
	2000-2004 average value of green trade = y^0	2015-2019 average value of green trade = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	Weight π	progress on green trade
Albania	0.41	0.17	0.47	-0.02	-0.04	1.92	1.13	0.10	-0.16
Algeria	0.21	0.73	0.47	0.03	0.17	1.00	2.25	0.15	0.65
Argentina	1.70	0.89	0.47	-0.05	-0.03	7.91	0.28	0.02	-0.13
Australia	1.76	1.13	0.47	-0.04	-0.02	8.20	0.27	0.02	-0.10
Austria	5.52	6.79	0.47	0.08	0.02	25.71	0.08	0.01	0.06
Azerbaijan	0.39	0.41	0.47	0.00	0.00	1.83	1.19	0.09	0.01
Bangladesh	0.41	0.17	0.47	-0.02	-0.04	2.44	1.13	0.06	-0.12
Belarus	2.28	2.08	0.47	-0.01	-0.01	10.59	0.21	0.02	-0.02
Belgium	3.00	3.29	0.47	0.02	0.01	13.95	0.16	0.01	0.03
Bolivia	1.56	0.87	0.47	-0.05	-0.03	7.57	0.30	0.03	-0.12
Brazil	3.32	2.65	0.47	-0.04	-0.01	15.45	0.14	0.01	-0.06
Bulgaria	2.35	3.74	0.47	0.09	0.04	10.92	0.20	0.02	0.16
Cambodia	0.06	0.28	0.47	0.01	0.23	0.47	7.28	0.30	0.55
Cameroon	0.19	0.61	0.47	0.03	0.15	1.10	2.49	0.13	0.46
Canada	3.00	3.20	0.47	0.01	0.00	13.98	0.16	0.01	0.02
Chile	2.17	0.59	0.47	-0.11	-0.05	10.11	0.22	0.02	-0.20
China	2.84	5.03	0.47	0.15	0.05	13.21	0.16	0.01	0.21
Colombia	0.90	0.71	0.47	-0.01	-0.01	4.20	0.52	0.04	-0.06
Costa Rica	1.82	1.90	0.47	0.01	0.00	8.49	0.26	0.03	0.01
Cote d'Ivoire	0.41	0.60	0.47	0.01	0.03	2.40	1.14	0.09	0.10
Croatia	2.55	3.53	0.47	0.07	0.03	11.85	0.18	0.01	0.11
Cyprus	1.94	1.49	0.47	-0.03	-0.02	9.03	0.24	0.01	-0.06
Czech Republic	5.26	7.11	0.47	0.12	0.02	24.46	0.09	0.01	0.10
Denmark	6.94	6.90	0.47	0.00	0.00	32.27	0.07	0.01	0.00
Dominican Republic	1.25	3.83	0.47	0.17	0.14	6.04	0.37	0.05	0.54
Ecuador	0.52	0.51	0.47	0.00	0.00	2.43	0.90	0.08	-0.01
Egypt, Arab Rep.	0.48	3.47	0.47	0.20	0.41	2.33	0.97	0.06	1.62
El Salvador	1.07	1.89	0.47	0.05	0.05	5.19	0.44	0.05	0.20
Estonia	3.18	4.82	0.47	0.11	0.03	14.79	0.15	0.02	0.14
Finland	4.64	5.93	0.47	0.09	0.02	21.60	0.10	0.01	0.08
France	4.67	4.77	0.47	0.01	0.00	21.73	0.10	0.01	0.01
Georgia	1.20	1.41	0.47	0.01	0.01	5.58	0.39	0.03	0.05
Germany	7.24	8.77	0.47	0.10	0.01	33.71	0.06	0.01	0.06
Ghana	0.47	1.02	0.47	0.04	0.08	2.75	1.00	0.07	0.24
Greece	2.49	2.37	0.47	-0.01	0.00	11.57	0.19	0.01	-0.01
Guatemala	1.28	1.85	0.47	0.04	0.03	6.19	0.37	0.03	0.12
Honduras	0.73	0.64	0.47	-0.01	-0.01	3.52	0.64	0.04	-0.03
Hungary	4.61	8.36	0.47	0.25	0.05	21.43	0.10	0.01	0.22
India	1.96	2.90	0.47	0.06	0.03	9.47	0.24	0.01	0.13
Indonesia	1.33	1.41	0.47	0.01	0.00	6.42	0.35	0.03	0.02

Ireland	1.39	1.68	0.47	0.02	0.01	6.46	0.34	0.01	0.06
Israel	4.81	5.01	0.47	0.01	0.00	22.36	0.10	0.01	0.01
Italy	7.13	7.40	0.47	0.02	0.00	33.17	0.07	0.01	0.01
Jamaica	3.97	1.57	0.47	-0.16	-0.04	18.49	0.12	0.01	-0.17
Japan	8.22	9.33	0.47	0.07	0.01	38.26	0.06	0.01	0.04
Jordan	2.02	1.59	0.47	-0.03	-0.01	9.40	0.23	0.02	-0.06
Kazakhstan	0.27	0.26	0.47	0.00	0.00	1.28	1.70	0.09	-0.01
Korea, Rep.	2.68	6.45	0.47	0.25	0.09	12.45	0.17	0.01	0.39
Latvia	2.13	2.70	0.47	0.04	0.02	9.93	0.22	0.02	0.07
Lithuania	2.44	4.89	0.47	0.16	0.07	11.35	0.19	0.02	0.27
Luxembourg	3.73	5.60	0.47	0.12	0.03	17.38	0.13	0.01	0.14
Macedonia, FYR	0.77	11.79	0.47	0.73	0.95	3.60	0.60	0.06	3.89
Malawi	0.21	1.24	0.47	0.07	0.33	1.24	2.21	0.18	1.00
Malaysia	2.75	6.49	0.47	0.25	0.09	12.80	0.17	0.01	0.37
Mexico	4.79	5.45	0.47	0.04	0.01	22.29	0.10	0.01	0.04
Moldova	2.20	2.69	0.47	0.03	0.01	10.66	0.21	0.03	0.06
Mongolia	0.06	0.12	0.47	0.00	0.07	0.47	8.05	0.41	0.15
Morocco	0.78	1.20	0.47	0.03	0.04	3.75	0.60	0.06	0.14
Mozambique	0.47	0.39	0.47	-0.01	-0.01	2.75	1.00	0.06	-0.04
Namibia	0.70	0.56	0.47	-0.01	-0.01	3.37	0.67	0.05	-0.05
Netherlands	3.15	4.84	0.47	0.11	0.04	14.65	0.15	0.01	0.15
New Zealand	3.46	1.54	0.47	-0.13	-0.04	16.09	0.14	0.01	-0.15
Nicaragua	0.84	0.18	0.47	-0.04	-0.05	4.08	0.56	0.05	-0.21
Norway	1.93	3.23	0.47	0.09	0.04	8.98	0.24	0.01	0.18
Pakistan	0.42	1.85	0.47	0.10	0.23	2.47	1.11	0.06	0.70
Panama	0.86	1.68	0.47	0.06	0.06	3.98	0.55	0.05	0.26
Paraguay	0.06	0.27	0.47	0.01	0.26	0.47	8.24	0.40	0.53
Peru	0.48	0.89	0.47	0.03	0.06	2.21	0.98	0.07	0.24
Philippines	0.98	4.54	0.47	0.24	0.24	4.72	0.48	0.01	0.95
Poland	4.02	5.32	0.47	0.09	0.02	18.68	0.12	0.01	0.09
Portugal	3.37	5.51	0.47	0.14	0.04	15.70	0.14	0.01	0.17
Russian Federation	1.51	1.38	0.47	-0.01	-0.01	7.04	0.31	0.03	-0.02
Senegal	1.20	0.55	0.47	-0.04	-0.04	7.05	0.39	0.03	-0.11
Singapore	3.24	5.26	0.47	0.13	0.04	15.07	0.14	0.01	0.17
Slovak Republic	3.26	4.15	0.47	0.06	0.02	15.16	0.14	0.01	0.08
Slovenia	5.90	5.61	0.47	-0.02	0.00	27.45	0.08	0.01	-0.01
South Africa	5.89	4.05	0.47	-0.12	-0.02	28.52	0.08	0.01	-0.08
Spain	3.36	3.27	0.47	-0.01	0.00	15.62	0.14	0.01	-0.01
Sweden	5.26	5.71	0.47	0.03	0.01	24.49	0.09	0.01	0.02
Switzerland	6.78	4.09	0.47	-0.18	-0.03	31.54	0.07	0.01	-0.11
Thailand	2.03	4.11	0.47	0.14	0.07	9.46	0.23	0.02	0.28
Togo	0.41	3.03	0.47	0.17	0.43	2.39	1.15	0.08	1.32
Tunisia	1.52	5.82	0.47	0.29	0.19	7.08	0.31	0.02	0.77
Turkey	2.77	3.49	0.47	0.05	0.02	12.89	0.17	0.01	0.07
Uganda	0.26	0.71	0.47	0.03	0.11	1.54	1.79	0.09	0.35
Ukraine	4.87	1.70	0.47	-0.21	-0.04	22.67	0.10	0.01	-0.18
United Kingdom	5.04	5.65	0.47	0.04	0.01	23.44	0.09	0.01	0.03
United States	6.98	6.42	0.47	-0.04	-0.01	32.50	0.07	0.00	-0.02
Uruguay	0.77	0.27	0.47	-0.03	-0.04	3.59	0.61	0.06	-0.18
Venezuela, RB	0.86	0.42	0.47	-0.04	-0.05	4.00	0.54	0.06	-0.14

Vietnam	0.62	2.29	0.47	0.11	0.18	2.99	0.76	0.05	0.71
Yemen, Rep.	0.32	0.47	0.47	0.01	0.03	1.86	1.48	0.06	0.10
Zambia	0.18	0.89	0.47	0.05	0.26	1.06	2.60	0.15	0.81

Source: Authors' calculations.

Environmental patents

Country	Current greenness			Progress of greenness					
	2000-2004 average value of environmental patents = y^0	2015-2019 average value of environmental patents = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	Weight π	progress on environmental patents
Argentina	0.01	0.01	0.01	0.00	0.03	0.02	1.21	0.08	0.25
Australia	0.01	0.01	0.01	0.00	0.01	0.03	0.86	0.06	0.08
Austria	0.03	0.02	0.01	0.00	-0.02	0.07	0.37	0.04	-0.20
Belgium	0.02	0.06	0.01	0.00	0.10	0.06	0.41	0.03	1.00
Brazil	0.01	0.02	0.01	0.00	0.02	0.04	0.78	0.07	0.16
Bulgaria	0.02	0.00	0.01	0.00	-0.07	0.05	0.56	0.04	-0.52
Canada	0.01	0.01	0.01	0.00	0.01	0.03	0.79	0.05	0.12
China	0.02	0.03	0.01	0.00	0.05	0.05	0.63	0.03	0.38
Colombia	0.01	0.03	0.01	0.00	0.13	0.03	1.01	0.09	1.00
Costa Rica	0.02	0.01	0.01	0.00	-0.04	0.05	0.56	0.06	-0.28
Croatia	0.02	0.02	0.01	0.00	0.01	0.05	0.47	0.04	0.06
Czech Republic	0.02	0.03	0.01	0.00	0.05	0.04	0.58	0.05	0.51
Denmark	0.02	0.02	0.01	0.00	0.00	0.05	0.50	0.05	-0.02
Ecuador	0.01	0.00	0.01	0.00	-0.07	0.03	0.97	0.09	-0.52
Egypt, Arab Rep.	0.02	0.02	0.01	0.00	0.00	0.25	0.45	0.03	0.00
Estonia	0.01	0.05	0.01	0.00	0.26	0.03	0.91	0.10	2.46
Finland	0.02	0.04	0.01	0.00	0.07	0.05	0.50	0.04	0.67
France	0.02	0.02	0.01	0.00	0.00	0.05	0.54	0.05	0.04
Georgia	0.01	0.02	0.01	0.00	0.02	0.04	0.65	0.05	0.17
Germany	0.02	0.02	0.01	0.00	0.00	0.04	0.56	0.06	0.00
Greece	0.02	0.03	0.01	0.00	0.02	0.05	0.45	0.03	0.15
Guatemala	0.01	0.00	0.01	0.00	-0.04	0.06	1.81	0.14	-0.06
Honduras	0.00	0.01	0.01	0.00	0.15	0.04	2.85	0.16	0.22
Hungary	0.01	0.02	0.01	0.00	0.03	0.03	0.85	0.07	0.33
India	0.02	0.00	0.01	0.00	-0.05	0.22	0.51	0.02	-0.07
Indonesia	0.01	0.00	0.01	0.00	-0.07	0.09	1.30	0.10	-0.09
Ireland	0.02	0.02	0.01	0.00	0.02	0.04	0.60	0.01	0.16
Israel	0.01	0.01	0.01	0.00	-0.01	0.02	1.00	0.09	-0.13
Italy	0.01	0.01	0.01	0.00	0.03	0.03	0.95	0.07	0.26
Japan	0.02	0.01	0.01	0.00	-0.02	0.04	0.55	0.05	-0.19
Jordan	0.02	0.00	0.01	0.00	-0.05	0.05	0.62	0.05	-0.41
Latvia	0.03	0.03	0.01	0.00	0.02	0.07	0.39	0.04	0.12
Lithuania	0.05	0.03	0.01	0.00	-0.03	0.13	0.19	0.02	-0.26
Luxembourg	0.04	0.01	0.01	0.00	-0.04	0.10	0.26	0.02	-0.42
Malaysia	0.01	0.02	0.01	0.00	0.02	0.04	0.65	0.05	0.14
Mexico	0.01	0.01	0.01	0.00	0.00	0.03	0.83	0.06	0.04
Moldova	0.03	0.01	0.01	0.00	-0.03	0.35	0.33	0.04	-0.05
Morocco	0.02	0.02	0.01	0.00	-0.01	0.27	0.42	0.04	-0.02
Netherlands	0.02	0.02	0.01	0.00	0.00	0.06	0.43	0.04	-0.02

New Zealand	0.01	0.01	0.01	0.00	0.01	0.03	0.94	0.09	0.07
Norway	0.01	0.02	0.01	0.00	0.01	0.04	0.67	0.04	0.13
Panama	0.01	0.01	0.01	0.00	-0.03	0.03	1.00	0.10	-0.15
Peru	0.01	0.02	0.01	0.00	0.07	0.03	0.86	0.06	0.55
Philippines	0.02	0.02	0.01	0.00	-0.02	0.29	0.39	0.01	-0.03
Poland	0.02	0.03	0.01	0.00	0.03	0.06	0.42	0.04	0.27
Portugal	0.03	0.03	0.01	0.00	0.02	0.06	0.38	0.03	0.20
Russian Federation	0.02	0.02	0.01	0.00	0.00	0.07	0.43	0.04	-0.01
Singapore	0.01	0.01	0.01	0.00	0.01	0.02	1.00	0.04	0.10
Slovak Republic	0.01	0.04	0.01	0.00	0.10	0.04	0.68	0.05	0.95
Slovenia	0.03	0.02	0.01	0.00	-0.02	0.07	0.36	0.03	-0.21
South Africa	0.01	0.00	0.01	0.00	-0.06	0.17	0.67	0.05	-0.09
Spain	0.02	0.03	0.01	0.00	0.02	0.06	0.44	0.04	0.18
Sweden	0.02	0.04	0.01	0.00	0.08	0.04	0.56	0.06	0.74
Switzerland	0.01	0.01	0.01	0.00	0.00	0.03	0.79	0.08	-0.04
Tajikistan	0.00	0.00	0.01	0.00	-0.10	0.04	2.96	0.17	-0.09
Tunisia	0.03	0.03	0.01	0.00	0.00	0.08	0.37	0.02	0.04
Turkey	0.01	0.01	0.01	0.00	-0.02	0.03	0.85	0.05	-0.12
Ukraine	0.02	0.02	0.01	0.00	0.00	0.05	0.54	0.03	-0.01
United Kingdom	0.01	0.01	0.01	0.00	0.00	0.02	1.31	0.08	0.04
United States	0.01	0.01	0.01	0.00	0.00	0.02	1.03	0.08	-0.04

Source: Authors' calculations.

Renewable energy

Country	Current greenness			Progress of greenness					
	2000-2004 average value of renewable energy = y^0	2015-2019 average value of renewable energy = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	Weight π	progress on renewable energy
Albania	37.23	38.62	5.15	0.09	0.00	88.36	0.14	0.01	0.03
Angola	70.66	49.57	5.15	-1.41	-0.02	100.00	0.07	0.01	-0.72
Argentina	11.65	10.04	5.15	-0.11	-0.01	42.59	0.44	0.03	-0.05
Australia	7.87	9.18	5.15	0.09	0.01	28.77	0.65	0.05	0.06
Austria	24.47	34.39	5.15	0.66	0.03	89.42	0.21	0.02	0.15
Azerbaijan	2.44	2.31	5.15	-0.01	0.00	5.78	2.11	0.16	-0.04
Bangladesh	54.78	34.75	5.15	-1.34	-0.02	100.00	0.09	0.01	-0.44
Belarus	5.51	6.77	5.15	0.08	0.02	13.07	0.94	0.09	0.17
Belgium	1.73	9.20	5.15	0.50	0.29	6.31	2.98	0.23	1.63
Benin	64.72	50.86	5.15	-0.92	-0.01	100.00	0.08	0.01	-0.39
Bolivia	26.81	17.54	5.15	-0.62	-0.02	63.62	0.19	0.02	-0.25
Brazil	43.60	43.79	5.15	0.01	0.00	100.00	0.12	0.01	0.00
Bulgaria	8.55	17.65	5.15	0.61	0.07	20.30	0.60	0.05	0.77
Cambodia	80.80	64.92	5.15	-1.06	-0.01	100.00	0.06	0.00	-0.83
Cameroon	85.12	76.54	5.15	-0.57	-0.01	100.00	0.06	0.00	-0.58
Canada	21.41	22.03	5.15	0.04	0.00	78.24	0.24	0.02	0.01
Chile	31.92	24.88	5.15	-0.47	-0.01	100.00	0.16	0.01	-0.10
China	25.90	12.41	5.15	-0.90	-0.03	61.46	0.20	0.01	-0.38
Colombia	28.78	23.56	5.15	-0.35	-0.01	68.30	0.18	0.02	-0.13
Costa Rica	34.17	38.73	5.15	0.30	0.01	81.10	0.15	0.02	0.10
Cote d'Ivoire	67.92	64.53	5.15	-0.23	0.00	100.00	0.08	0.01	-0.11
Croatia	25.96	33.13	5.15	0.48	0.02	94.85	0.20	0.02	0.10
Cyprus	3.18	9.94	5.15	0.45	0.14	11.61	1.62	0.10	0.80
Czech Republic	6.67	14.83	5.15	0.54	0.08	24.37	0.77	0.07	0.46
Denmark	12.18	33.17	5.15	1.40	0.11	44.50	0.42	0.04	0.65
Dominican Republic	18.41	16.48	5.15	-0.13	-0.01	43.68	0.28	0.03	-0.08
Ecuador	18.09	13.82	5.15	-0.29	-0.02	42.94	0.28	0.03	-0.17
Egypt, Arab Rep.	7.60	5.71	5.15	-0.13	-0.02	18.04	0.68	0.04	-0.18
El Salvador	49.43	24.40	5.15	-1.67	-0.03	100.00	0.10	0.01	-0.50
Estonia	19.60	27.48	5.15	0.52	0.03	71.63	0.26	0.03	0.15
Finland	29.97	43.24	5.15	0.88	0.03	100.00	0.17	0.01	0.19
France	9.01	13.50	5.15	0.30	0.03	32.93	0.57	0.06	0.19
Georgia	53.40	28.66	5.15	-1.65	-0.03	100.00	0.10	0.01	-0.53
Germany	4.58	14.21	5.15	0.64	0.14	16.73	1.12	0.12	0.79
Ghana	66.69	41.41	5.15	-1.69	-0.03	100.00	0.08	0.01	-0.76
Greece	7.23	17.17	5.15	0.66	0.09	26.44	0.71	0.05	0.52
Guatemala	60.25	63.65	5.15	0.23	0.00	100.00	0.09	0.01	0.09
Honduras	50.38	51.54	5.15	0.08	0.00	100.00	0.10	0.01	0.02
Hungary	5.02	15.56	5.15	0.70	0.14	18.34	1.03	0.08	0.79
India	50.90	36.02	5.15	-0.99	-0.02	100.00	0.10	0.00	-0.30

Indonesia	43.79	36.88	5.15	-0.46	-0.01	100.00	0.12	0.01	-0.12
Ireland	2.12	9.08	5.15	0.46	0.22	7.73	2.43	0.05	1.24
Israel	6.40	3.71	5.15	-0.18	-0.03	23.40	0.80	0.07	-0.16
Italy	5.66	16.52	5.15	0.72	0.13	20.66	0.91	0.07	0.72
Jamaica	12.05	16.77	5.15	0.31	0.03	28.60	0.43	0.04	0.29
Japan	3.89	6.30	5.15	0.16	0.04	14.21	1.32	0.12	0.23
Jordan	2.02	3.23	5.15	0.08	0.04	5.15	2.55	0.20	0.39
Kazakhstan	2.37	1.56	5.15	-0.05	-0.02	5.63	2.17	0.11	-0.25
Kenya	81.05	72.66	5.15	-0.56	-0.01	100.00	0.06	0.00	-0.44
Korea, Rep.	0.74	2.71	5.15	0.13	0.18	5.15	6.95	0.33	0.45
Kyrgyz Republic	31.54	23.31	5.15	-0.55	-0.02	74.86	0.16	0.01	-0.19
Latvia	35.20	38.10	5.15	0.19	0.01	83.54	0.15	0.02	0.06
Lithuania	17.76	28.96	5.15	0.75	0.04	64.89	0.29	0.03	0.24
Luxembourg	2.85	9.03	5.15	0.41	0.14	10.40	1.81	0.12	0.82
Malawi	81.90	83.65	5.15	0.12	0.00	100.00	0.06	0.01	0.10
Malaysia	5.90	5.19	5.15	-0.05	-0.01	14.01	0.87	0.06	-0.09
Mali	85.78	61.53	5.15	-1.62	-0.02	100.00	0.06	0.00	-1.71
Mexico	10.92	9.22	5.15	-0.11	-0.01	25.91	0.47	0.04	-0.11
Moldova	5.58	14.27	5.15	0.58	0.10	13.25	0.92	0.12	1.13
Mongolia	6.02	3.43	5.15	-0.17	-0.03	14.29	0.86	0.04	-0.31
Morocco	16.90	11.32	5.15	-0.37	-0.02	40.12	0.30	0.03	-0.24
Mozambique	93.39	86.40	5.15	-0.47	0.00	100.00	0.06	0.00	-1.06
Namibia	32.10	26.47	5.15	-0.38	-0.01	76.18	0.16	0.01	-0.13
Nepal	89.14	85.26	5.15	-0.26	0.00	100.00	0.06	0.00	-0.36
Netherlands	1.93	5.89	5.15	0.26	0.14	7.04	2.67	0.24	0.78
New Zealand	28.65	30.79	5.15	0.14	0.00	100.00	0.18	0.02	0.03
Nicaragua	55.88	48.20	5.15	-0.51	-0.01	100.00	0.09	0.01	-0.17
Norway	58.48	57.77	5.15	-0.05	0.00	100.00	0.09	0.01	-0.02
Pakistan	50.12	46.48	5.15	-0.24	0.00	100.00	0.10	0.01	-0.07
Panama	33.48	21.23	5.15	-0.82	-0.02	79.46	0.15	0.01	-0.27
Paraguay	68.34	61.68	5.15	-0.44	-0.01	100.00	0.08	0.00	-0.21
Peru	33.72	25.50	5.15	-0.55	-0.02	80.02	0.15	0.01	-0.18
Philippines	32.91	27.45	5.15	-0.36	-0.01	78.12	0.16	0.00	-0.12
Poland	7.26	11.91	5.15	0.31	0.04	26.54	0.71	0.06	0.24
Portugal	20.24	27.16	5.15	0.46	0.02	73.95	0.25	0.02	0.13
Russian Federation	3.48	3.30	5.15	-0.01	0.00	8.27	1.48	0.13	-0.04
Senegal	44.67	42.71	5.15	-0.13	0.00	100.00	0.12	0.01	-0.04
Singapore	0.52	0.71	5.15	0.01	0.02	5.15	9.91	0.35	0.04
Slovak Republic	5.36	13.41	5.15	0.54	0.10	19.59	0.96	0.07	0.57
Slovenia	14.91	20.88	5.15	0.40	0.03	54.48	0.35	0.03	0.15
South Africa	18.04	17.15	5.15	-0.06	0.00	42.83	0.29	0.02	-0.04
Spain	8.23	16.25	5.15	0.53	0.06	30.08	0.63	0.06	0.37
Sri Lanka	62.42	52.88	5.15	-0.64	-0.01	100.00	0.08	0.01	-0.25
Sweden	36.91	53.25	5.15	1.09	0.03	100.00	0.14	0.01	0.26
Switzerland	18.74	25.29	5.15	0.44	0.02	68.49	0.27	0.03	0.13
Tajikistan	63.34	44.66	5.15	-1.25	-0.02	100.00	0.08	0.00	-0.51
Thailand	20.49	22.86	5.15	0.16	0.01	48.63	0.25	0.02	0.08
Togo	77.76	71.26	5.15	-0.43	-0.01	100.00	0.07	0.00	-0.29
Tunisia	14.21	12.56	5.15	-0.11	-0.01	33.72	0.36	0.02	-0.08
Turkey	17.18	13.37	5.15	-0.25	-0.01	40.77	0.30	0.02	-0.16

Uganda	94.10	89.06	5.15	-0.34	0.00	100.00	0.05	0.00	-0.86
Ukraine	1.14	4.14	5.15	0.20	0.18	5.15	4.53	0.27	0.75
United Kingdom	0.97	8.71	5.15	0.52	0.53	5.15	5.30	0.33	1.85
United States	5.15	8.72	5.15	0.24	0.05	18.82	1.00	0.07	0.26
Uruguay	40.84	58.02	5.15	1.15	0.03	96.94	0.13	0.01	0.31
Venezuela, RB	13.53	12.84	5.15	-0.05	0.00	32.11	0.38	0.04	-0.04
Vietnam	52.75	35.00	5.15	-1.18	-0.02	100.00	0.10	0.01	-0.38
Yemen, Rep.	1.02	2.28	5.15	0.08	0.08	5.15	5.03	0.20	0.30
Zambia	89.66	87.99	5.15	-0.11	0.00	100.00	0.06	0.00	-0.16
Zimbabwe	74.90	81.80	5.15	0.46	0.01	100.00	0.07	0.01	0.27

Source: Authors' calculations.

Palma ratio

Country	Current greenness			Progress of greenness					
	2000-2004 average value of Palma ratio = y^0	2015-2019 average value of Palma ratio = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	Weight π	progress on Palma ratio
Albania	0.83	0.81	1.50	0.00	0.00	0.57	0.55	0.05	0.07
Angola	1.72	1.64	1.50	-0.01	0.00	1.19	1.15	0.10	0.16
Argentina	1.57	1.07	1.50	-0.03	-0.02	1.09	1.05	0.07	1.04
Bangladesh	0.94	0.89	1.50	0.00	0.00	0.65	0.63	0.03	0.17
Belarus	0.74	0.66	1.50	-0.01	-0.01	0.51	0.49	0.05	0.36
Belgium	1.05	0.92	1.50	-0.01	-0.01	0.72	0.70	0.05	0.40
Benin	1.11	1.57	1.50	0.03	0.03	0.77	0.74	0.06	-1.31
Bolivia	2.18	1.21	1.50	-0.06	-0.03	1.32	1.46	0.14	1.13
Brazil	2.15	1.85	1.50	-0.02	-0.01	1.48	1.43	0.13	0.44
Cameroon	1.25	1.34	1.50	0.01	0.01	0.87	0.84	0.04	-0.22
Canada	1.20	1.15	1.50	0.00	0.00	0.83	0.80	0.05	0.12
Chile	1.84	1.42	1.50	-0.03	-0.02	1.27	1.23	0.09	0.74
China	1.12	1.02	1.50	-0.01	-0.01	0.77	0.75	0.04	0.28
Colombia	2.11	1.66	1.50	-0.03	-0.01	1.46	1.41	0.12	0.69
Costa Rica	1.56	1.48	1.50	-0.01	0.00	1.07	1.04	0.12	0.17
Cote d'Ivoire	1.22	1.17	1.50	0.00	0.00	0.85	0.82	0.07	0.15
Cyprus	0.78	0.89	1.50	0.01	0.01	0.54	0.52	0.03	-0.45
Czech Republic	0.94	0.87	1.50	0.00	0.00	0.65	0.63	0.05	0.24
Dominican Republic	1.70	1.33	1.50	-0.02	-0.01	1.03	1.13	0.14	0.55
Ecuador	1.96	1.32	1.50	-0.04	-0.02	1.36	1.31	0.12	1.06
Egypt, Arab Rep.	0.92	0.92	1.50	0.00	0.00	0.56	0.61	0.03	0.01
El Salvador	1.56	1.08	1.50	-0.03	-0.02	0.94	1.04	0.11	0.78
Finland	0.91	0.93	1.50	0.00	0.00	0.63	0.61	0.05	-0.05
Georgia	1.00	0.97	1.50	0.00	0.00	0.69	0.66	0.05	0.09
Greece	1.29	1.27	1.50	0.00	0.00	0.89	0.86	0.06	0.04
Guatemala	2.00	1.54	1.50	-0.05	-0.02	1.21	1.33	0.10	0.57
Honduras	1.97	1.55	1.50	-0.03	-0.01	1.19	1.31	0.07	0.53
Hungary	0.79	0.78	1.50	0.00	0.00	0.55	0.53	0.04	0.06
India	1.00	1.05	1.50	0.01	0.01	0.60	0.67	0.03	-0.13
Indonesia	0.85	1.07	1.50	0.01	0.02	0.51	0.57	0.04	-0.66
Ireland	1.25	1.11	1.50	-0.01	-0.01	0.86	0.83	0.02	0.36
Italy	1.29	1.28	1.50	0.00	0.00	0.89	0.86	0.07	0.03
Jordan	1.04	0.93	1.50	-0.01	-0.01	0.71	0.69	0.05	0.34
Kazakhstan	0.87	0.71	1.50	-0.01	-0.01	0.60	0.58	0.03	0.60
Kyrgyz Republic	0.80	0.75	1.50	0.00	0.00	0.48	0.53	0.05	0.15
Latvia	1.00	0.88	1.50	-0.01	-0.01	0.69	0.67	0.07	0.38
Lithuania	1.00	1.02	1.50	0.00	0.00	0.69	0.66	0.07	-0.09
Malawi	1.21	1.51	1.50	0.02	0.02	0.83	0.80	0.07	-0.82
Malaysia	1.32	1.13	1.50	-0.01	-0.01	0.91	0.88	0.06	0.47
Mexico	1.73	1.45	1.50	-0.02	-0.01	1.19	1.15	0.09	0.51

Moldova	0.97	0.69	1.50	-0.02	-0.02	0.59	0.65	0.08	0.73
Mongolia	0.80	0.84	1.50	0.00	0.00	0.49	0.54	0.03	-0.13
Morocco	1.17	1.16	1.50	0.00	0.00	0.71	0.78	0.07	0.02
Mozambique	1.63	2.11	1.50	0.05	0.03	1.13	1.09	0.06	-0.94
Namibia	3.13	2.29	1.50	-0.06	-0.02	1.50	2.09	0.16	0.52
Nepal	1.44	0.87	1.50	-0.06	-0.04	0.99	0.96	0.05	1.26
Nicaragua	1.90	1.48	1.50	-0.04	-0.02	1.15	1.27	0.11	0.55
Norway	1.07	0.92	1.50	-0.01	-0.01	0.74	0.71	0.04	0.46
Pakistan	0.89	0.98	1.50	0.01	0.01	0.62	0.59	0.03	-0.33
Panama	1.91	1.56	1.50	-0.02	-0.01	1.32	1.27	0.12	0.59
Paraguay	1.99	1.49	1.50	-0.03	-0.02	1.20	1.32	0.06	0.63
Peru	1.67	1.21	1.50	-0.03	-0.02	1.15	1.11	0.08	0.88
Philippines	1.47	1.32	1.50	-0.01	-0.01	0.89	0.98	0.02	0.25
Portugal	1.70	1.28	1.50	-0.03	-0.02	1.17	1.13	0.09	0.80
Russian Federation	1.01	1.03	1.50	0.00	0.00	0.70	0.67	0.06	-0.06
Senegal	1.23	1.12	1.50	-0.01	-0.01	0.85	0.82	0.06	0.31
Slovak Republic	0.93	0.77	1.50	-0.01	-0.01	0.64	0.62	0.05	0.56
Slovenia	0.80	0.82	1.50	0.00	0.00	0.55	0.53	0.05	-0.08
South Africa	2.05	2.73	1.50	0.07	0.03	1.24	1.37	0.10	-0.84
Sri Lanka	1.23	1.21	1.50	0.00	0.00	0.85	0.82	0.06	0.05
Switzerland	0.81	0.84	1.50	0.00	0.00	0.56	0.54	0.05	-0.13
Tajikistan	0.87	0.89	1.50	0.00	0.00	0.53	0.58	0.03	-0.05
Thailand	1.24	0.97	1.50	-0.02	-0.01	0.86	0.83	0.07	0.70
Tunisia	1.14	0.84	1.50	-0.02	-0.02	0.79	0.76	0.04	0.84
Turkey	1.16	1.20	1.50	0.00	0.00	0.80	0.77	0.04	-0.13
Uganda	1.50	1.29	1.50	-0.01	-0.01	1.04	1.00	0.05	0.45
Ukraine	0.74	0.67	1.50	0.00	-0.01	0.51	0.49	0.03	0.31
United Kingdom	1.48	1.50	1.50	0.00	0.00	1.02	0.98	0.06	-0.05
Uruguay	1.27	1.05	1.50	-0.01	-0.01	0.88	0.85	0.09	0.57
Vietnam	1.02	0.94	1.50	-0.01	-0.01	0.62	0.68	0.05	0.21
Zambia	1.56	2.00	1.50	0.03	0.02	1.08	1.04	0.06	-0.91

Source: Authors' calculations.

Gender inequality

Country	Current greenness			Progress of greenness					
	2000-2004 average value of gender inequality = y^0	2015-2019 average value of gender inequality = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	Weight π	progress on gender inequality
Albania	0.35	0.24	0.62	-0.01	-0.02	0.15	0.57	0.05	0.53
Algeria	0.62	0.44	0.62	-0.01	-0.02	0.26	1.00	0.07	0.49
Argentina	0.40	0.36	0.62	0.00	-0.01	0.13	0.64	0.04	0.16
Australia	0.16	0.11	0.62	0.00	-0.02	0.05	0.26	0.02	0.50
Austria	0.15	0.08	0.62	0.00	-0.03	0.05	0.24	0.03	0.68
Azerbaijan	0.33	0.32	0.62	0.00	0.00	0.13	0.52	0.04	0.05
Bangladesh	0.67	0.54	0.62	-0.01	-0.01	0.28	1.08	0.06	0.33
Belgium	0.13	0.05	0.62	-0.01	-0.04	0.04	0.21	0.02	0.89
Benin	0.67	0.62	0.62	0.00	-0.01	0.28	1.08	0.08	0.14
Bolivia	0.57	0.45	0.62	-0.01	-0.01	0.24	0.92	0.09	0.36
Brazil	0.50	0.40	0.62	-0.01	-0.01	0.21	0.80	0.07	0.33
Bulgaria	0.32	0.23	0.62	-0.01	-0.02	0.13	0.51	0.04	0.50
Cambodia	0.61	0.48	0.62	-0.01	-0.01	0.25	0.97	0.04	0.37
Cameroon	0.68	0.57	0.62	-0.01	-0.01	0.28	1.09	0.06	0.27
Canada	0.16	0.10	0.62	0.00	-0.03	0.05	0.25	0.02	0.59
Chile	0.43	0.32	0.62	-0.01	-0.02	0.14	0.69	0.05	0.40
China	0.25	0.16	0.62	-0.01	-0.02	0.10	0.40	0.02	0.59
Colombia	0.51	0.41	0.62	-0.01	-0.01	0.21	0.81	0.07	0.32
Costa Rica	0.41	0.30	0.62	-0.01	-0.02	0.17	0.66	0.07	0.45
Cote d'Ivoire	0.70	0.66	0.62	0.00	0.00	0.29	1.12	0.09	0.09
Croatia	0.22	0.14	0.62	-0.01	-0.02	0.07	0.35	0.03	0.53
Cyprus	0.25	0.09	0.62	-0.01	-0.04	0.08	0.39	0.02	0.91
Czech Republic	0.20	0.13	0.62	0.00	-0.02	0.07	0.32	0.03	0.50
Denmark	0.08	0.04	0.62	0.00	-0.03	0.03	0.13	0.01	0.71
Dominican Republic	0.52	0.46	0.62	0.00	-0.01	0.21	0.83	0.10	0.19
Ecuador	0.51	0.39	0.62	-0.01	-0.02	0.21	0.82	0.08	0.40
Egypt, Arab Rep.	0.63	0.45	0.62	-0.01	-0.02	0.26	1.01	0.06	0.48
El Salvador	0.51	0.40	0.62	-0.01	-0.02	0.21	0.82	0.09	0.38
Estonia	0.29	0.12	0.62	-0.01	-0.04	0.10	0.47	0.05	0.88
Finland	0.09	0.06	0.62	0.00	-0.03	0.03	0.15	0.01	0.56
France	0.17	0.07	0.62	-0.01	-0.04	0.06	0.27	0.03	0.88
Georgia	0.41	0.36	0.62	0.00	-0.01	0.17	0.66	0.05	0.21
Germany	0.13	0.08	0.62	0.00	-0.03	0.04	0.22	0.02	0.60
Ghana	0.60	0.55	0.62	0.00	-0.01	0.25	0.96	0.07	0.15
Greece	0.23	0.12	0.62	-0.01	-0.03	0.07	0.37	0.03	0.68
Guatemala	0.59	0.49	0.62	-0.01	-0.01	0.24	0.94	0.07	0.26
Honduras	0.53	0.48	0.62	0.00	-0.01	0.22	0.85	0.05	0.17
Hungary	0.29	0.26	0.62	0.00	-0.01	0.09	0.47	0.04	0.14
India	2.44	0.53	0.62	-0.13	-0.05	0.62	3.92	0.17	1.05
Indonesia	0.56	0.46	0.62	-0.01	-0.01	0.23	0.90	0.07	0.31

Ireland	19.65	0.11	0.62	-1.30	-0.07	0.62	31.51	0.69	1.03
Israel	0.20	0.11	0.62	-0.01	-0.03	0.07	0.33	0.03	0.71
Italy	0.18	0.08	0.62	-0.01	-0.04	0.06	0.30	0.02	0.84
Jamaica	0.47	0.41	0.62	0.00	-0.01	0.19	0.76	0.08	0.22
Japan	0.15	0.11	0.62	0.00	-0.02	0.05	0.23	0.02	0.39
Jordan	0.62	0.48	0.62	-0.01	-0.02	0.26	1.00	0.08	0.40
Kazakhstan	0.40	0.21	0.62	-0.01	-0.03	0.17	0.65	0.03	0.83
Kenya	0.69	0.55	0.62	-0.01	-0.01	0.28	1.10	0.06	0.33
Korea, Rep.	0.19	0.06	0.62	-0.01	-0.05	0.06	0.31	0.01	1.00
Kyrgyz Republic	0.56	0.39	0.62	-0.01	-0.02	0.23	0.89	0.08	0.50
Latvia	0.30	0.19	0.62	-0.01	-0.02	0.12	0.48	0.05	0.61
Lithuania	0.26	0.13	0.62	-0.01	-0.03	0.09	0.42	0.04	0.75
Luxembourg	0.18	0.07	0.62	-0.01	-0.04	0.06	0.28	0.02	0.87
Malawi	0.69	0.62	0.62	0.00	-0.01	0.28	1.10	0.09	0.17
Malaysia	0.35	0.28	0.62	0.00	-0.01	0.14	0.56	0.04	0.32
Mali	0.71	0.68	0.62	0.00	0.00	0.29	1.14	0.05	0.08
Mexico	0.48	0.35	0.62	-0.01	-0.02	0.20	0.77	0.06	0.47
Moldova	0.40	0.23	0.62	-0.01	-0.03	0.16	0.64	0.08	0.70
Mongolia	0.46	0.32	0.62	-0.01	-0.02	0.19	0.73	0.04	0.51
Morocco	0.67	0.50	0.62	-0.01	-0.02	0.28	1.08	0.10	0.44
Mozambique	0.63	0.57	0.62	0.00	-0.01	0.26	1.01	0.06	0.16
Namibia	0.54	0.47	0.62	0.00	-0.01	0.22	0.87	0.07	0.22
Nepal	0.68	0.49	0.62	-0.01	-0.02	0.28	1.08	0.06	0.47
Netherlands	0.10	0.04	0.62	0.00	-0.04	0.03	0.16	0.01	0.81
New Zealand	0.20	0.14	0.62	0.00	-0.02	0.06	0.32	0.03	0.41
Nicaragua	0.59	0.46	0.62	-0.01	-0.01	0.24	0.95	0.09	0.38
Norway	0.10	0.05	0.62	0.00	-0.04	0.03	0.17	0.01	0.79
Pakistan	0.69	0.55	0.62	-0.01	-0.01	0.28	1.10	0.06	0.34
Panama	0.50	0.46	0.62	0.00	0.00	0.21	0.80	0.08	0.13
Paraguay	0.56	0.48	0.62	0.00	-0.01	0.23	0.89	0.04	0.22
Peru	0.51	0.39	0.62	-0.01	-0.02	0.21	0.81	0.06	0.40
Philippines	20.36	0.43	0.62	-1.33	-0.07	0.62	32.65	0.73	1.01
Poland	0.21	0.13	0.62	-0.01	-0.02	0.07	0.34	0.03	0.55
Portugal	0.21	0.09	0.62	-0.01	-0.04	0.07	0.34	0.03	0.85
Russian Federation	0.42	0.27	0.62	-0.01	-0.02	0.17	0.67	0.06	0.60
Senegal	0.64	0.53	0.62	-0.01	-0.01	0.26	1.02	0.07	0.30
Singapore	0.23	0.07	0.62	-0.01	-0.05	0.07	0.37	0.01	1.06
Slovak Republic	0.22	0.19	0.62	0.00	-0.01	0.07	0.35	0.03	0.22
Slovenia	0.19	0.06	0.62	-0.01	-0.05	0.06	0.31	0.03	1.01
South Africa	0.42	0.42	0.62	0.00	0.00	0.17	0.67	0.05	-0.02
Spain	0.13	0.08	0.62	0.00	-0.03	0.04	0.21	0.02	0.59
Sri Lanka	0.46	0.39	0.62	0.00	-0.01	0.19	0.73	0.06	0.26
Sweden	0.07	0.04	0.62	0.00	-0.02	0.02	0.11	0.01	0.54
Switzerland	0.09	0.04	0.62	0.00	-0.04	0.03	0.15	0.02	0.83
Tajikistan	0.47	0.38	0.62	-0.01	-0.01	0.19	0.75	0.04	0.33
Thailand	0.38	0.38	0.62	0.00	0.00	0.16	0.61	0.05	0.01
Togo	0.68	0.57	0.62	-0.01	-0.01	0.28	1.09	0.07	0.27
Tunisia	0.43	0.30	0.62	-0.01	-0.02	0.18	0.69	0.04	0.53
Turkey	0.60	0.32	0.62	-0.02	-0.03	0.25	0.95	0.05	0.78
Uganda	0.63	0.53	0.62	-0.01	-0.01	0.26	1.01	0.05	0.26

Ukraine	0.41	0.29	0.62	-0.01	-0.02	0.17	0.66	0.04	0.50
United Kingdom	0.22	0.13	0.62	-0.01	-0.03	0.07	0.35	0.02	0.58
United States	0.28	0.20	0.62	-0.01	-0.02	0.09	0.46	0.03	0.42
Uruguay	0.40	0.28	0.62	-0.01	-0.02	0.17	0.64	0.07	0.51
Venezuela, RB	0.51	0.47	0.62	0.00	-0.01	0.21	0.81	0.08	0.13
Vietnam	0.35	0.32	0.62	0.00	-0.01	0.14	0.56	0.04	0.13
Yemen, Rep.	0.82	0.84	0.62	0.00	0.00	0.34	1.31	0.05	-0.04
Zambia	0.64	0.55	0.62	-0.01	-0.01	0.26	1.02	0.06	0.24
Zimbabwe	0.60	0.53	0.62	0.00	-0.01	0.25	0.97	0.08	0.20

Source: Authors' calculations.

Access to basic services

Country	Current greenness			Progress of greenness					
	2000-2004 average value of access to basic services = y^0	2015-2019 average value of access to basic services = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	Weight π	progress on access to basic services
Albania	43.86	69.94	41.66	1.74	0.04	98.36	0.95	0.08	0.48
Algeria	18.46	58.85	41.66	2.69	0.15	41.66	2.26	0.15	1.74
Angola	24.60	41.97	41.66	1.16	0.05	81.64	1.69	0.14	0.30
Argentina	96.16	99.95	41.66	0.25	0.00	100.00	0.43	0.03	0.99
Australia	82.11	87.38	41.66	0.35	0.00	100.00	0.51	0.04	0.29
Azerbaijan	75.07	86.51	41.66	0.76	0.01	100.00	0.56	0.04	0.46
Bangladesh	46.53	68.02	41.66	1.43	0.03	100.00	0.90	0.05	0.40
Belarus	90.38	91.77	41.66	0.09	0.00	100.00	0.46	0.05	0.14
Belgium	95.08	98.87	41.66	0.25	0.00	100.00	0.44	0.03	0.77
Benin	23.45	38.17	41.66	0.98	0.04	77.81	1.78	0.13	0.27
Bolivia	42.09	57.45	41.66	1.02	0.02	94.40	0.99	0.09	0.29
Brazil	61.60	73.46	41.66	0.79	0.01	100.00	0.68	0.06	0.31
Bulgaria	81.56	86.48	41.66	0.33	0.00	100.00	0.51	0.04	0.27
Cambodia	18.46	53.38	41.66	2.33	0.13	41.66	2.26	0.09	1.50
Cameroon	44.73	60.69	41.66	1.06	0.02	100.00	0.93	0.05	0.29
Canada	91.81	93.73	41.66	0.13	0.00	100.00	0.45	0.03	0.23
Chile	80.02	91.34	41.66	0.75	0.01	100.00	0.52	0.04	0.57
China	62.94	84.14	41.66	1.41	0.02	100.00	0.66	0.03	0.57
Colombia	59.23	62.85	41.66	0.24	0.00	100.00	0.70	0.06	0.09
Costa Rica	93.23	96.64	41.66	0.23	0.00	100.00	0.45	0.05	0.50
Cote d'Ivoire	42.05	50.63	41.66	0.57	0.01	100.00	0.99	0.08	0.15
Croatia	82.53	82.86	41.66	0.02	0.00	100.00	0.50	0.04	0.02
Cyprus	90.61	91.71	41.66	0.07	0.00	100.00	0.46	0.03	0.12
Czech Republic	93.38	97.32	41.66	0.26	0.00	100.00	0.45	0.04	0.60
Denmark	95.35	97.16	41.66	0.12	0.00	100.00	0.44	0.04	0.39
Dominican Republic	89.56	99.37	41.66	0.65	0.01	100.00	0.47	0.06	0.94
Ecuador	67.73	72.02	41.66	0.29	0.00	100.00	0.62	0.06	0.13
Egypt, Arab Rep.	75.98	80.00	41.66	0.27	0.00	100.00	0.55	0.03	0.17
El Salvador	86.69	97.05	41.66	0.69	0.01	100.00	0.48	0.05	0.78
Estonia	96.59	96.97	41.66	0.03	0.00	100.00	0.43	0.05	0.11
France	95.41	95.39	41.66	0.00	0.00	100.00	0.44	0.04	0.00
Georgia	65.52	68.87	41.66	0.22	0.00	100.00	0.64	0.05	0.10
Ghana	31.40	56.93	41.66	1.70	0.05	100.00	1.33	0.09	0.37
Greece	92.28	96.50	41.66	0.28	0.00	100.00	0.45	0.03	0.55
Guatemala	62.03	74.09	41.66	0.80	0.01	100.00	0.67	0.05	0.32
Honduras	65.39	89.99	41.66	1.64	0.03	100.00	0.64	0.03	0.71
Hungary	82.47	94.16	41.66	0.78	0.01	100.00	0.51	0.04	0.67
India	61.16	91.38	41.66	2.01	0.03	100.00	0.68	0.03	0.78
Indonesia	87.42	97.95	41.66	0.70	0.01	100.00	0.48	0.04	0.84

Ireland	83.29	93.20	41.66	0.66	0.01	100.00	0.50	0.01	0.59
Israel	93.66	97.42	41.66	0.25	0.00	100.00	0.44	0.04	0.59
Italy	93.79	97.02	41.66	0.22	0.00	100.00	0.44	0.04	0.52
Jamaica	86.60	97.20	41.66	0.71	0.01	100.00	0.48	0.05	0.79
Jordan	89.64	91.41	41.66	0.12	0.00	100.00	0.46	0.04	0.17
Kazakhstan	79.64	93.76	41.66	0.94	0.01	100.00	0.52	0.03	0.69
Kenya	18.50	61.40	41.66	2.86	0.15	61.40	2.25	0.13	1.00
Korea, Rep.	94.85	99.30	41.66	0.30	0.00	100.00	0.44	0.02	0.86
Kyrgyz Republic	73.21	83.75	41.66	0.70	0.01	100.00	0.57	0.05	0.39
Latvia	90.64	93.44	41.66	0.19	0.00	100.00	0.46	0.05	0.30
Lithuania	84.38	94.13	41.66	0.65	0.01	100.00	0.49	0.05	0.62
Malaysia	85.64	93.52	41.66	0.53	0.01	100.00	0.49	0.03	0.55
Mali	10.80	30.62	41.66	1.32	0.12	41.66	3.86	0.16	0.64
Mexico	52.12	63.42	41.66	0.75	0.01	100.00	0.80	0.06	0.24
Moldova	71.84	86.29	41.66	0.96	0.01	100.00	0.58	0.07	0.51
Mongolia	47.74	58.23	41.66	0.70	0.01	100.00	0.87	0.04	0.20
Morocco	54.49	69.44	41.66	1.00	0.02	100.00	0.76	0.07	0.33
Namibia	37.29	51.92	41.66	0.98	0.03	83.63	1.12	0.09	0.32
Nepal	28.56	58.81	41.66	2.02	0.07	94.78	1.46	0.08	0.46
New Zealand	85.97	95.94	41.66	0.66	0.01	100.00	0.48	0.05	0.71
Nicaragua	61.77	68.75	41.66	0.47	0.01	100.00	0.67	0.06	0.18
Norway	91.12	91.50	41.66	0.03	0.00	100.00	0.46	0.03	0.04
Pakistan	54.20	53.33	41.66	-0.06	0.00	100.00	0.77	0.04	-0.02
Panama	83.74	98.01	41.66	0.95	0.01	100.00	0.50	0.05	0.88
Paraguay	62.82	73.38	41.66	0.70	0.01	100.00	0.66	0.03	0.28
Peru	44.72	61.76	41.66	1.14	0.03	100.00	0.93	0.06	0.31
Philippines	53.08	63.21	41.66	0.68	0.01	100.00	0.78	0.02	0.22
Poland	90.34	97.09	41.66	0.45	0.00	100.00	0.46	0.04	0.70
Portugal	81.01	93.00	41.66	0.80	0.01	100.00	0.51	0.04	0.63
Russian Federation	76.74	78.57	41.66	0.12	0.00	100.00	0.54	0.05	0.08
Senegal	26.70	42.14	41.66	1.03	0.04	88.60	1.56	0.11	0.25
Slovak Republic	92.29	94.10	41.66	0.12	0.00	100.00	0.45	0.03	0.23
Slovenia	85.11	93.42	41.66	0.55	0.01	100.00	0.49	0.04	0.56
South Africa	75.75	86.33	41.66	0.71	0.01	100.00	0.55	0.04	0.44
Sri Lanka	73.62	97.16	41.66	1.57	0.02	100.00	0.57	0.04	0.89
Switzerland	96.99	98.33	41.66	0.09	0.00	100.00	0.43	0.04	0.45
Tajikistan	68.33	73.32	41.66	0.33	0.00	100.00	0.61	0.04	0.16
Thailand	88.98	99.88	41.66	0.73	0.01	100.00	0.47	0.04	0.99
Togo	21.28	47.97	41.66	1.78	0.08	70.62	1.96	0.13	0.54
Tunisia	69.24	89.91	41.66	1.38	0.02	100.00	0.60	0.03	0.67
Turkey	53.83	82.53	41.66	1.91	0.04	100.00	0.77	0.04	0.62
Ukraine	54.69	86.04	41.66	2.09	0.04	100.00	0.76	0.05	0.69
United States	94.21	96.30	41.66	0.14	0.00	100.00	0.44	0.03	0.36
Vietnam	88.99	99.75	41.66	0.72	0.01	100.00	0.47	0.03	0.98
Yemen, Rep.	51.40	70.81	41.66	1.29	0.03	100.00	0.81	0.03	0.40
Zambia	18.57	36.63	41.66	1.20	0.06	61.64	2.24	0.13	0.42
Zimbabwe	34.52	38.79	41.66	0.28	0.01	100.00	1.21	0.10	0.07

Source: Authors' calculations.

Mean years of schooling

Country	Current greenness			Progress of greenness					
	2000-2004 average value of mean years of schooling = y^0	2015-2019 average value of mean years of schooling = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	Weight π	progress on mean years of schooling
Albania	8.92	10.05	4.63	0.08	0.01	13.61	0.52	0.04	0.24
Algeria	6.30	7.95	4.63	0.11	0.02	9.61	0.73	0.05	0.50
Angola	4.40	5.08	4.63	0.05	0.01	8.31	1.05	0.09	0.17
Argentina	9.18	10.53	4.63	0.09	0.01	14.00	0.50	0.04	0.28
Australia	11.84	12.63	4.63	0.05	0.00	14.00	0.39	0.03	0.36
Austria	9.40	12.60	4.63	0.21	0.02	14.00	0.49	0.05	0.70
Azerbaijan	10.60	10.50	4.63	-0.01	0.00	14.00	0.44	0.03	-0.03
Bangladesh	4.32	5.98	4.63	0.11	0.03	8.16	1.07	0.06	0.43
Belarus	9.06	12.28	4.63	0.21	0.02	13.82	0.51	0.05	0.68
Belgium	10.28	11.78	4.63	0.10	0.01	14.00	0.45	0.04	0.40
Benin	2.66	3.63	4.63	0.06	0.02	5.03	1.74	0.13	0.41
Bolivia	7.22	8.90	4.63	0.11	0.02	11.01	0.64	0.06	0.44
Brazil	5.96	7.73	4.63	0.12	0.02	9.09	0.78	0.07	0.56
Bulgaria	9.92	11.80	4.63	0.13	0.01	14.00	0.47	0.04	0.46
Cambodia	3.34	4.75	4.63	0.09	0.03	5.09	1.39	0.06	0.80
Cameroon	5.00	6.18	4.63	0.08	0.02	9.45	0.93	0.05	0.26
Canada	11.48	13.28	4.63	0.12	0.01	14.00	0.40	0.03	0.71
Chile	9.20	10.33	4.63	0.08	0.01	14.00	0.50	0.04	0.23
China	6.62	7.80	4.63	0.08	0.01	10.10	0.70	0.04	0.34
Colombia	6.52	8.25	4.63	0.12	0.02	9.94	0.71	0.06	0.51
Costa Rica	7.96	8.65	4.63	0.05	0.01	12.14	0.58	0.07	0.17
Cote d'Ivoire	3.42	5.13	4.63	0.11	0.03	6.46	1.35	0.11	0.56
Croatia	9.70	11.38	4.63	0.11	0.01	14.00	0.48	0.04	0.39
Cyprus	10.24	12.05	4.63	0.12	0.01	14.00	0.45	0.03	0.48
Czech Republic	11.12	12.70	4.63	0.11	0.01	14.00	0.42	0.04	0.55
Denmark	11.96	12.58	4.63	0.04	0.00	14.00	0.39	0.04	0.30
Dominican Republic	6.66	7.88	4.63	0.08	0.01	10.16	0.70	0.08	0.35
Ecuador	7.08	8.93	4.63	0.12	0.02	10.80	0.65	0.06	0.50
Egypt, Arab Rep.	5.10	7.20	4.63	0.14	0.03	7.78	0.91	0.05	0.78
El Salvador	5.50	6.83	4.63	0.09	0.02	8.39	0.84	0.09	0.46
Estonia	11.86	13.00	4.63	0.08	0.01	14.00	0.39	0.04	0.53
Finland	9.94	12.40	4.63	0.16	0.02	14.00	0.47	0.04	0.61
France	10.08	11.43	4.63	0.09	0.01	14.00	0.46	0.05	0.34
Georgia	11.88	12.78	4.63	0.06	0.01	14.00	0.39	0.03	0.42
Germany	12.12	14.10	4.63	0.13	0.01	14.00	0.38	0.04	1.05
Ghana	6.24	7.08	4.63	0.06	0.01	11.79	0.74	0.05	0.15
Greece	9.08	10.48	4.63	0.09	0.01	13.85	0.51	0.03	0.29
Guatemala	3.72	6.45	4.63	0.18	0.05	5.67	1.24	0.10	1.40
Honduras	4.48	6.50	4.63	0.13	0.03	6.83	1.03	0.06	0.86

Hungary	10.38	11.85	4.63	0.10	0.01	14.00	0.45	0.03	0.41
India	4.58	6.40	4.63	0.12	0.03	6.99	1.01	0.04	0.76
Indonesia	7.02	7.98	4.63	0.06	0.01	10.71	0.66	0.05	0.26
Ireland	11.20	12.45	4.63	0.08	0.01	14.00	0.41	0.01	0.45
Israel	12.12	12.98	4.63	0.06	0.00	14.00	0.38	0.03	0.45
Italy	8.82	10.18	4.63	0.09	0.01	13.45	0.52	0.04	0.29
Jamaica	7.66	9.70	4.63	0.14	0.02	11.68	0.60	0.06	0.51
Japan	10.90	12.70	4.63	0.12	0.01	14.00	0.42	0.04	0.58
Jordan	9.62	10.40	4.63	0.05	0.01	14.00	0.48	0.04	0.18
Kazakhstan	10.98	11.75	4.63	0.05	0.00	14.00	0.42	0.02	0.25
Kenya	5.50	6.45	4.63	0.06	0.01	10.39	0.84	0.05	0.19
Korea, Rep.	10.88	12.18	4.63	0.09	0.01	14.00	0.43	0.02	0.42
Kyrgyz Republic	9.96	10.90	4.63	0.06	0.01	14.00	0.46	0.04	0.23
Latvia	10.60	12.80	4.63	0.15	0.01	14.00	0.44	0.05	0.65
Lithuania	11.10	12.93	4.63	0.12	0.01	14.00	0.42	0.04	0.63
Luxembourg	10.70	12.13	4.63	0.10	0.01	14.00	0.43	0.03	0.43
Macedonia, FYR	7.14	9.65	4.63	0.17	0.02	10.89	0.65	0.06	0.67
Malawi	3.18	4.50	4.63	0.09	0.03	6.01	1.46	0.12	0.47
Malaysia	8.20	10.20	4.63	0.13	0.02	12.51	0.56	0.04	0.46
Mali	1.40	2.28	4.63	0.06	0.04	4.63	3.31	0.13	0.27
Mexico	7.00	8.60	4.63	0.11	0.02	10.68	0.66	0.05	0.44
Moldova	9.56	11.60	4.63	0.14	0.01	14.00	0.48	0.06	0.46
Mongolia	8.36	10.15	4.63	0.12	0.01	12.75	0.55	0.03	0.41
Morocco	3.60	5.35	4.63	0.12	0.03	5.49	1.29	0.12	0.93
Mozambique	2.50	3.35	4.63	0.06	0.02	4.72	1.85	0.11	0.38
Namibia	5.78	6.85	4.63	0.07	0.01	8.82	0.80	0.06	0.35
Nepal	2.54	4.80	4.63	0.15	0.06	4.80	1.82	0.10	1.00
Netherlands	11.14	12.18	4.63	0.07	0.01	14.00	0.42	0.04	0.36
New Zealand	11.60	12.60	4.63	0.07	0.01	14.00	0.40	0.04	0.42
Nicaragua	5.24	6.70	4.63	0.10	0.02	7.99	0.88	0.08	0.53
Norway	12.22	12.58	4.63	0.02	0.00	14.00	0.38	0.02	0.20
Pakistan	3.78	5.15	4.63	0.09	0.02	7.14	1.22	0.06	0.41
Panama	8.70	10.08	4.63	0.09	0.01	13.27	0.53	0.05	0.30
Paraguay	6.54	8.42	4.63	0.13	0.02	9.98	0.71	0.03	0.55
Peru	8.28	9.18	4.63	0.06	0.01	12.63	0.56	0.04	0.21
Philippines	7.96	9.35	4.63	0.09	0.01	12.14	0.58	0.01	0.33
Poland	11.34	12.28	4.63	0.06	0.01	14.00	0.41	0.04	0.35
Portugal	7.06	9.18	4.63	0.14	0.02	10.77	0.66	0.05	0.57
Russian Federation	11.38	11.90	4.63	0.03	0.00	14.00	0.41	0.03	0.20
Senegal	2.28	2.98	4.63	0.05	0.02	4.63	2.03	0.15	0.30
Singapore	9.52	11.48	4.63	0.13	0.01	14.00	0.49	0.02	0.44
Slovak Republic	10.36	12.58	4.63	0.15	0.01	14.00	0.45	0.03	0.61
Slovenia	11.62	12.13	4.63	0.03	0.00	14.00	0.40	0.03	0.21
South Africa	8.48	10.18	4.63	0.11	0.01	12.93	0.55	0.04	0.38
Spain	8.52	9.78	4.63	0.08	0.01	12.99	0.54	0.05	0.28
Sri Lanka	10.18	10.95	4.63	0.05	0.01	14.00	0.45	0.04	0.20
Sweden	11.72	12.40	4.63	0.05	0.00	14.00	0.40	0.04	0.30
Switzerland	11.68	13.40	4.63	0.11	0.01	14.00	0.40	0.04	0.74
Tajikistan	10.58	10.63	4.63	0.00	0.00	14.00	0.44	0.03	0.01
Thailand	6.48	7.65	4.63	0.08	0.01	9.88	0.71	0.06	0.34

Togo	4.08	4.88	4.63	0.05	0.01	7.71	1.13	0.08	0.22
Tunisia	5.24	7.13	4.63	0.13	0.02	7.99	0.88	0.05	0.68
Turkey	5.72	7.75	4.63	0.14	0.02	8.72	0.81	0.04	0.68
Uganda	4.16	5.83	4.63	0.11	0.03	7.86	1.11	0.06	0.45
Ukraine	10.58	11.30	4.63	0.05	0.00	14.00	0.44	0.03	0.21
United Kingdom	11.90	12.90	4.63	0.07	0.01	14.00	0.39	0.02	0.48
United States	12.74	13.38	4.63	0.04	0.00	14.00	0.36	0.03	0.50
Uruguay	8.00	8.70	4.63	0.05	0.01	12.20	0.58	0.06	0.17
Venezuela, RB	6.76	10.25	4.63	0.23	0.03	10.31	0.68	0.07	0.98
Vietnam	5.80	8.13	4.63	0.16	0.03	8.85	0.80	0.06	0.76
Yemen, Rep.	1.46	3.05	4.63	0.11	0.07	4.63	3.17	0.13	0.50
Zambia	6.06	7.00	4.63	0.06	0.01	11.45	0.76	0.04	0.17
Zimbabwe	6.74	8.30	4.63	0.10	0.02	12.74	0.69	0.06	0.26

Source: Authors' calculations.

Terrestrial protected areas

Country	Current greenness			Progress of greenness				
	2000-2004 average value of terrestrial protected areas = y^0	2010-2014 average value of terrestrial protected areas = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	progress on terrestrial protected areas
Albania	6.19	9.48	17.00	3.28	0.53	20.77	2.75	0.23
Algeria	6.23	7.38	17.00	1.14	0.18	20.92	2.73	0.08
Angola	12.06	12.06	17.00	0.00	0.00	39.33	1.41	0.00
Argentina	5.75	6.65	17.00	0.90	0.16	19.28	2.96	0.07
Armenia	7.04	8.10	17.00	1.06	0.15	23.63	2.41	0.06
Australia	11.33	15.04	17.00	3.71	0.33	36.96	1.50	0.14
Austria	23.52	23.59	17.00	0.06	0.00	76.72	0.72	0.00
Azerbaijan	6.75	7.36	17.00	0.60	0.09	22.66	2.52	0.04
Bangladesh	4.07	4.24	17.00	0.17	0.04	17.00	4.18	0.01
Belarus	7.15	8.28	17.00	1.13	0.16	23.31	2.38	0.07
Belgium	15.99	24.47	17.00	8.48	0.53	52.15	1.06	0.23
Benin	24.44	25.51	17.00	1.07	0.04	79.72	0.70	0.02
Bolivia	18.73	20.83	17.00	2.10	0.11	61.09	0.91	0.05
Botswana	37.17	37.19	17.00	0.02	0.00	100.00	0.46	0.00
Brazil	14.35	25.97	17.00	11.62	0.81	46.81	1.18	0.36
Bulgaria	4.22	35.42	17.00	31.21	7.40	17.00	4.03	2.44
Cambodia	20.90	23.76	17.00	2.85	0.14	68.17	0.81	0.06
Cameroon	7.52	10.91	17.00	3.39	0.45	24.53	2.26	0.20
Canada	5.72	6.96	17.00	1.24	0.22	19.20	2.97	0.09
Chile	13.96	15.04	17.00	1.07	0.08	45.53	1.22	0.03
China	14.92	16.12	17.00	1.20	0.08	48.65	1.14	0.04
Colombia	18.72	20.83	17.00	2.11	0.11	61.06	0.91	0.05
Costa Rica	20.52	22.60	17.00	2.08	0.10	66.93	0.83	0.04
Cote d'Ivoire	21.90	22.17	17.00	0.27	0.01	71.43	0.78	0.01
Croatia	7.26	10.32	17.00	3.05	0.42	23.69	2.34	0.19
Cyprus	16.19	17.15	17.00	0.96	0.06	52.79	1.05	0.03
Czech Republic	16.32	22.37	17.00	6.05	0.37	53.21	1.04	0.16
Denmark	20.42	23.56	17.00	3.14	0.15	66.59	0.83	0.07
Dominican Republic	24.04	20.82	17.00	-3.22	-0.13	78.41	0.71	-0.06
Ecuador	37.10	37.03	17.00	-0.07	0.00	100.00	0.46	0.00
Egypt, Arab Rep.	4.45	11.34	17.00	6.89	1.55	17.00	3.82	0.55
Estonia	19.94	23.16	17.00	3.22	0.16	65.01	0.85	0.07
Finland	13.00	15.17	17.00	2.17	0.17	42.39	1.31	0.07
France	17.44	28.70	17.00	11.26	0.65	56.88	0.97	0.29
Georgia	3.68	3.68	17.00	0.00	0.00	17.00	4.62	0.00
Germany	42.15	49.04	17.00	6.89	0.16	100.00	0.40	0.12
Ghana	14.41	14.41	17.00	0.00	0.00	46.99	1.18	0.00
Greece	14.13	21.48	17.00	7.35	0.52	46.07	1.20	0.23
Guatemala	28.46	29.82	17.00	1.36	0.05	92.82	0.60	0.02
Honduras	15.85	16.22	17.00	0.37	0.02	51.69	1.07	0.01
Hungary	6.70	23.11	17.00	16.41	2.45	22.48	2.54	1.04
Iceland	7.41	13.27	17.00	5.86	0.79	24.18	2.29	0.35
India	4.81	4.92	17.00	0.11	0.02	17.00	3.53	0.01
Indonesia	5.57	8.93	17.00	3.36	0.60	18.70	3.05	0.26
Ireland	6.51	12.80	17.00	6.30	0.97	21.83	2.61	0.41
Israel	14.74	14.74	17.00	0.00	0.00	48.06	1.15	0.00
Italy	12.44	21.03	17.00	8.58	0.69	40.58	1.37	0.31
Jamaica	6.98	7.06	17.00	0.08	0.01	23.43	2.43	0.00
Japan	10.37	10.96	17.00	0.60	0.06	33.81	1.64	0.03

Kazakhstan	2.57	3.20	17.00	0.63	0.24	17.00	6.61	0.04
Kenya	11.61	11.57	17.00	-0.04	0.00	37.88	1.46	0.00
Korea, Rep.	3.94	5.24	17.00	1.30	0.33	17.00	4.32	0.10
Kyrgyz Republic	6.94	6.30	17.00	-0.64	-0.09	23.29	2.45	-0.04
Latvia	14.29	17.58	17.00	3.30	0.23	46.59	1.19	0.10
Lithuania	11.56	17.25	17.00	5.69	0.49	37.69	1.47	0.22
Luxembourg	33.31	39.65	17.00	6.34	0.19	100.00	0.51	0.10
Macedonia, FYR	6.19	7.27	17.00	1.09	0.18	20.75	2.75	0.07
Malawi	16.47	17.36	17.00	0.89	0.05	53.72	1.03	0.02
Malaysia	13.72	13.93	17.00	0.21	0.01	44.75	1.24	0.01
Mali	2.60	6.05	17.00	3.44	1.32	17.00	6.53	0.24
Mexico	8.30	13.68	17.00	5.38	0.65	27.06	2.05	0.29
Mongolia	13.45	13.78	17.00	0.33	0.02	43.85	1.26	0.01
Mozambique	13.77	15.73	17.00	1.96	0.14	44.90	1.23	0.06
Namibia	19.20	40.90	17.00	21.69	1.13	62.63	0.89	0.50
Nepal	17.01	16.38	17.00	-0.62	-0.04	55.47	1.00	-0.02
Netherlands	30.15	31.48	17.00	1.33	0.04	98.32	0.56	0.02
New Zealand	19.70	21.32	17.00	1.62	0.08	64.26	0.86	0.04
Nicaragua	26.98	32.47	17.00	5.49	0.20	87.97	0.63	0.09
Norway	6.77	12.12	17.00	5.35	0.79	22.71	2.51	0.34
Pakistan	9.85	10.56	17.00	0.71	0.07	32.12	1.73	0.03
Panama	11.98	14.11	17.00	2.13	0.18	39.06	1.42	0.08
Paraguay	5.05	6.40	17.00	1.35	0.27	17.00	3.37	0.11
Peru	7.74	17.98	17.00	10.24	1.32	25.25	2.20	0.58
Philippines	4.99	5.06	17.00	0.07	0.01	17.00	3.41	0.01
Poland	21.94	34.81	17.00	12.87	0.59	71.55	0.77	0.26
Portugal	13.95	14.74	17.00	0.78	0.06	45.50	1.22	0.02
Russian Federation	10.81	11.32	17.00	0.51	0.05	35.26	1.57	0.02
Senegal	24.27	24.20	17.00	-0.07	0.00	79.15	0.70	0.00
Singapore	3.28	3.39	17.00	0.12	0.04	17.00	5.19	0.01
Slovak Republic	20.52	36.09	17.00	15.57	0.76	66.92	0.83	0.34
Slovenia	8.85	54.86	17.00	46.01	5.20	28.87	1.92	2.30
South Africa	6.83	6.56	17.00	-0.27	-0.04	22.92	2.49	-0.02
Spain	23.15	25.32	17.00	2.17	0.09	75.48	0.73	0.04
Sri Lanka	14.99	15.40	17.00	0.41	0.03	48.88	1.13	0.01
Sweden	12.06	13.87	17.00	1.81	0.15	39.33	1.41	0.07
Switzerland	22.26	26.30	17.00	4.05	0.18	72.58	0.76	0.08
Tajikistan	4.14	4.77	17.00	0.64	0.15	17.00	4.11	0.05
Thailand	14.67	16.41	17.00	1.74	0.12	47.85	1.16	0.05
Togo	11.32	24.21	17.00	12.89	1.14	36.93	1.50	0.50
Turkey	2.08	2.11	17.00	0.03	0.02	41.05	8.17	0.00
Uganda	8.53	11.45	17.00	2.92	0.34	27.82	1.99	0.15
Ukraine	4.44	4.49	17.00	0.06	0.01	17.00	3.83	0.00
United Kingdom	19.95	23.37	17.00	3.42	0.17	65.06	0.85	0.08
United States	14.94	15.14	17.00	0.20	0.01	48.72	1.14	0.01
Venezuela, RB	49.48	49.54	17.00	0.07	0.00	100.00	0.34	0.00
Vietnam	4.03	4.71	17.00	0.68	0.17	17.00	4.21	0.05
Zambia	36.05	37.78	17.00	1.73	0.05	100.00	0.47	0.03
Zimbabwe	18.05	27.17	17.00	9.12	0.51	58.86	0.94	0.22

Source: Authors' calculations. Same as PAGE (2017b).

Marine protected areas

Country	Current greenness			Progress of greenness				
	2000-2004 average value of marine protected areas = y^0	2010-2014 average value of marine protected areas = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	progress on marine protected areas
Argentina	1.64	1.64	10.00	0.00	0.00	21.23	6.10	0.00
Australia	29.53	33.24	10.00	3.72	0.13	100.00	0.34	0.05
Bangladesh	2.25	2.54	10.00	0.30	0.13	29.13	4.45	0.01
Belgium	44.13	55.72	10.00	11.60	0.26	100.00	0.23	0.21
Brazil	14.39	16.34	10.00	1.95	0.14	100.00	0.69	0.02
Chile	4.18	4.75	10.00	0.57	0.14	54.13	2.39	0.01
China	1.10	1.65	10.00	0.55	0.50	14.25	9.09	0.04
Colombia	5.70	16.13	10.00	10.44	1.83	73.81	1.75	0.15
Costa Rica	14.98	15.46	10.00	0.48	0.03	100.00	0.67	0.01
Croatia	1.41	3.51	10.00	2.10	1.49	18.30	7.08	0.12
Cyprus	1.27	1.32	10.00	0.05	0.04	16.44	7.88	0.00
Denmark	23.22	29.15	10.00	5.93	0.26	100.00	0.43	0.08
Dominican Republic	30.37	28.58	10.00	-1.79	-0.06	100.00	0.33	-0.03
Ecuador	74.96	75.66	10.00	0.70	0.01	100.00	0.13	0.03
Egypt, Arab Rep.	6.50	13.14	10.00	6.64	1.02	84.22	1.54	0.09
Estonia	24.73	27.45	10.00	2.72	0.11	100.00	0.40	0.04
Finland	14.79	15.65	10.00	0.86	0.06	100.00	0.68	0.01
France	21.60	58.55	10.00	36.95	1.71	100.00	0.46	0.47
Germany	51.60	64.46	10.00	12.87	0.25	100.00	0.19	0.27
Ghana	1.74	1.74	10.00	0.00	0.00	22.57	5.74	0.00
Greece	5.08	6.31	10.00	1.22	0.24	65.85	1.97	0.02
Guatemala	12.68	12.99	10.00	0.30	0.02	100.00	0.79	0.00
Honduras	1.46	2.66	10.00	1.20	0.82	18.97	6.83	0.07
Iceland	3.79	3.90	10.00	0.11	0.03	49.08	2.64	0.00
India	1.75	1.61	10.00	-0.14	-0.08	22.70	5.70	-0.01
Ireland	3.45	10.18	10.00	6.73	1.95	44.64	2.90	0.16
Italy	3.18	19.90	10.00	16.72	5.25	41.23	3.14	0.44
Jamaica	4.55	4.63	10.00	0.08	0.02	58.92	2.20	0.00
Japan	4.98	5.59	10.00	0.61	0.12	64.50	2.01	0.01
Jordan	29.97	29.97	10.00	0.00	0.00	100.00	0.33	0.00
Kenya	10.47	10.50	10.00	0.02	0.00	100.00	0.95	0.00
Korea, Rep.	3.51	3.92	10.00	0.41	0.12	45.44	2.85	0.01
Latvia	6.74	11.48	10.00	4.74	0.70	87.25	1.48	0.06
Lithuania	10.86	30.71	10.00	19.85	1.83	100.00	0.92	0.22
Malaysia	2.02	2.28	10.00	0.27	0.13	26.13	4.96	0.01
Mexico	12.22	18.84	10.00	6.62	0.54	100.00	0.82	0.08
Mozambique	1.81	2.41	10.00	0.60	0.33	23.41	5.53	0.03
Netherlands	58.66	61.82	10.00	3.15	0.05	100.00	0.17	0.08
New Zealand	8.45	12.45	10.00	4.00	0.47	100.00	1.18	0.04
Nicaragua	15.66	37.74	10.00	22.07	1.41	100.00	0.64	0.26
Norway	1.41	2.83	10.00	1.42	1.01	18.25	7.10	0.08
Pakistan	1.96	5.85	10.00	3.89	1.99	25.38	5.10	0.17
Panama	4.70	7.41	10.00	2.71	0.58	60.87	2.13	0.05
Peru	2.84	3.93	10.00	1.09	0.38	36.82	3.52	0.03
Philippines	2.43	2.49	10.00	0.05	0.02	31.53	4.11	0.00
Poland	4.07	52.77	10.00	48.69	11.95	52.77	2.45	1.00
Portugal	3.18	4.10	10.00	0.92	0.29	41.19	3.14	0.02
Russian Federation	11.15	11.63	10.00	0.48	0.04	100.00	0.90	0.01
Senegal	8.10	14.44	10.00	6.35	0.78	100.00	1.23	0.07

Singapore	1.43	1.44	10.00	0.02	0.01	18.49	7.01	0.00
South Africa	3.42	12.76	10.00	9.33	2.73	44.35	2.92	0.23
Spain	8.15	9.37	10.00	1.22	0.15	100.00	1.23	0.01
Sri Lanka	1.10	1.34	10.00	0.24	0.22	14.20	9.12	0.02
Sweden	7.34	10.23	10.00	2.89	0.39	95.01	1.36	0.03
Thailand	4.20	5.07	10.00	0.87	0.21	54.36	2.38	0.02
Tunisia	1.17	2.30	10.00	1.13	0.97	15.13	8.56	0.08
Turkey	2.63	2.70	10.00	0.07	0.03	34.02	3.81	0.00
Ukraine	10.69	10.70	10.00	0.01	0.00	100.00	0.94	0.00
United Kingdom	11.74	16.61	10.00	4.86	0.41	100.00	0.85	0.06
United States	28.21	30.40	10.00	2.19	0.08	100.00	0.35	0.03
Venezuela, RB	16.01	16.01	10.00	0.00	0.00	100.00	0.62	0.00
Yemen, Rep.	1.77	3.30	10.00	1.53	0.87	22.89	5.66	0.07

Source: Authors' calculations. Same as PAGE (2017b).

Pension coverage

Country	Current greenness			Progress of greenness					
	2000-2004 average value of pension coverage = y^0	2015-2019 average value of pension coverage = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	Weight π	progress on pension coverage
Albania	89.00	77.00	6.00	-0.80	-0.01	100.00	0.07	0.01	-1.09
Algeria	50.00	63.60	6.00	0.91	0.02	100.00	0.12	0.01	0.27
Angola	8.00	14.50	6.00	0.43	0.05	33.33	0.75	0.06	0.26
Argentina	70.00	89.30	6.00	1.29	0.02	100.00	0.09	0.01	0.64
Australia	80.00	70.70	6.00	-0.62	-0.01	100.00	0.08	0.01	-0.47
Austria	96.00	100.00	6.00	0.27	0.00	100.00	0.06	0.01	1.00
Azerbaijan	97.00	81.10	6.00	-1.06	-0.01	100.00	0.06	0.00	-5.30
Bangladesh	6.00	33.40	6.00	1.83	0.30	43.20	1.00	0.05	0.74
Belarus	39.00	100.00	6.00	4.07	0.10	100.00	0.15	0.02	1.00
Benin	6.35	11.00	6.00	0.31	0.05	26.46	0.94	0.07	0.23
Bolivia	81.00	100.00	6.00	1.27	0.02	100.00	0.07	0.01	1.00
Brazil	84.00	78.30	6.00	-0.38	0.00	100.00	0.07	0.01	-0.36
Bulgaria	96.00	100.00	6.00	0.27	0.00	100.00	0.06	0.00	1.00
Cambodia	1.00	4.10	6.00	0.21	0.21	7.20	6.00	0.25	0.50
Cameroon	10.00	13.00	6.00	0.20	0.02	41.67	0.60	0.03	0.09
Canada	91.00	95.73	6.00	0.32	0.00	100.00	0.07	0.00	0.53
Chile	63.00	53.07	6.00	-0.66	-0.01	100.00	0.10	0.01	-0.27
China	24.00	100.00	6.00	5.07	0.21	100.00	0.25	0.01	1.00
Colombia	14.00	51.70	6.00	2.51	0.18	58.33	0.43	0.04	0.85
Costa Rica	28.00	68.80	6.00	2.72	0.10	100.00	0.21	0.02	0.57
Cote d'Ivoire	4.00	7.70	6.00	0.25	0.06	28.80	1.50	0.12	0.15
Cyprus	74.00	92.85	6.00	1.26	0.02	100.00	0.08	0.00	0.73
Ecuador	14.00	52.00	6.00	2.53	0.18	58.33	0.43	0.04	0.86
Estonia	92.00	100.00	6.00	0.53	0.01	100.00	0.07	0.01	1.00
Georgia	80.00	91.90	6.00	0.79	0.01	100.00	0.08	0.01	0.60
Ghana	5.00	16.90	6.00	0.79	0.16	36.00	1.20	0.08	0.38
Greece	91.00	77.40	6.00	-0.91	-0.01	100.00	0.07	0.00	-1.51
Guatemala	12.00	17.25	6.00	0.35	0.03	50.00	0.50	0.04	0.14
Honduras	3.00	7.50	6.00	0.30	0.10	21.60	2.00	0.11	0.24
Hungary	97.00	100.00	6.00	0.20	0.00	100.00	0.06	0.00	1.00
India	7.00	25.20	6.00	1.21	0.17	29.17	0.86	0.04	0.82
Indonesia	6.00	14.00	6.00	0.53	0.09	43.20	1.00	0.08	0.22
Israel	78.00	83.05	6.00	0.34	0.00	100.00	0.08	0.01	0.23
Italy	65.00	90.35	6.00	1.69	0.03	100.00	0.09	0.01	0.72
Japan	74.00	100.00	6.00	1.73	0.02	100.00	0.08	0.01	1.00
Jordan	40.00	42.20	6.00	0.15	0.00	100.00	0.15	0.01	0.04
Kenya	1.00	24.80	6.00	1.59	1.59	7.20	6.00	0.35	3.84
Kyrgyz Republic	86.00	100.00	6.00	0.93	0.01	100.00	0.07	0.01	1.00
Lithuania	91.00	100.00	6.00	0.60	0.01	100.00	0.07	0.01	1.00
Malawi	4.00	2.30	6.00	-0.11	-0.03	28.80	1.50	0.12	-0.07

Malaysia	15.00	19.80	6.00	0.32	0.02	62.50	0.40	0.03	0.10
Mali	4.00	2.70	6.00	-0.09	-0.02	28.80	1.50	0.06	-0.05
Mexico	10.00	71.35	6.00	4.09	0.41	41.67	0.60	0.05	1.94
Moldova	84.00	75.20	6.00	-0.59	-0.01	100.00	0.07	0.01	-0.55
Mongolia	80.00	100.00	6.00	1.33	0.02	100.00	0.08	0.00	1.00
Mozambique	6.00	17.30	6.00	0.75	0.13	43.20	1.00	0.06	0.30
Namibia	88.00	98.40	6.00	0.69	0.01	100.00	0.07	0.01	0.87
Nepal	33.00	62.50	6.00	1.97	0.06	100.00	0.18	0.01	0.44
Nicaragua	4.00	23.70	6.00	1.31	0.33	28.80	1.50	0.13	0.79
Norway	95.00	96.60	6.00	0.11	0.00	100.00	0.06	0.00	0.32
Pakistan	2.00	2.30	6.00	0.02	0.01	14.40	3.00	0.15	0.02
Paraguay	8.00	22.20	6.00	0.95	0.12	33.33	0.75	0.04	0.56
Peru	17.00	19.30	6.00	0.15	0.01	70.83	0.35	0.02	0.04
Philippines	20.00	39.80	6.00	1.32	0.07	83.33	0.30	0.01	0.31
Poland	80.00	100.00	6.00	1.33	0.02	100.00	0.08	0.01	1.00
Portugal	97.00	82.30	6.00	-0.98	-0.01	100.00	0.06	0.00	-4.90
Russian Federation	96.00	95.60	6.00	-0.03	0.00	100.00	0.06	0.01	-0.10
Senegal	10.00	23.50	6.00	0.90	0.09	41.67	0.60	0.04	0.43
Slovak Republic	94.00	100.00	6.00	0.40	0.00	100.00	0.06	0.00	1.00
Slovenia	79.00	100.00	6.00	1.40	0.02	100.00	0.08	0.01	1.00
South Africa	69.00	81.40	6.00	0.83	0.01	100.00	0.09	0.01	0.40
Spain	75.00	65.70	6.00	-0.62	-0.01	100.00	0.08	0.01	-0.37
Sri Lanka	19.00	23.35	6.00	0.29	0.02	79.17	0.32	0.02	0.07
Tajikistan	88.00	92.80	6.00	0.32	0.00	100.00	0.07	0.00	0.40
Thailand	5.00	83.00	6.00	5.20	1.04	36.00	1.20	0.10	2.52
Togo	8.45	19.00	6.00	0.70	0.08	35.21	0.71	0.05	0.39
Tunisia	34.00	43.90	6.00	0.66	0.02	100.00	0.18	0.01	0.15
Turkey	55.00	100.00	6.00	3.00	0.05	100.00	0.11	0.01	1.00
Uganda	1.00	7.20	6.00	0.41	0.41	7.20	6.00	0.31	1.00
Ukraine	92.00	93.95	6.00	0.13	0.00	100.00	0.07	0.00	0.24
United Kingdom	98.00	100.00	6.00	0.13	0.00	100.00	0.06	0.00	1.00
United States	98.00	87.00	6.00	-0.73	-0.01	100.00	0.06	0.00	-5.50
Uruguay	62.00	76.50	6.00	0.97	0.02	100.00	0.10	0.01	0.38
Vietnam	16.00	39.90	6.00	1.59	0.10	66.67	0.38	0.03	0.47
Yemen, Rep.	8.00	8.50	6.00	0.03	0.00	33.33	0.75	0.03	0.02
Zambia	3.00	8.80	6.00	0.39	0.13	21.60	2.00	0.12	0.31

Source: Authors' calculations.

Life expectancy

Country	Current greenness			Progress of greenness					
	2000-2004 average value of life expectancy = y^0	2015-2019 average value of life expectancy = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	Weight π	progress on life expectancy
Albania	74.54	78.25	60.91	0.25	0.00	84.00	0.82	0.07	0.39
Algeria	71.61	76.40	60.91	0.32	0.00	84.00	0.85	0.06	0.39
Angola	47.80	60.12	60.91	0.82	0.02	63.74	1.27	0.11	0.77
Argentina	73.93	76.30	60.91	0.16	0.00	84.00	0.82	0.06	0.23
Australia	79.91	82.52	60.91	0.17	0.00	84.00	0.76	0.05	0.64
Austria	78.64	81.54	60.91	0.19	0.00	84.00	0.77	0.08	0.54
Azerbaijan	67.45	72.58	60.91	0.34	0.01	79.17	0.90	0.07	0.44
Bangladesh	66.41	71.92	60.91	0.37	0.01	77.95	0.92	0.05	0.48
Belarus	68.60	73.94	60.91	0.36	0.01	80.52	0.89	0.09	0.45
Belgium	78.16	81.38	60.91	0.21	0.00	84.00	0.78	0.06	0.55
Benin	56.08	61.03	60.91	0.33	0.01	74.79	1.09	0.08	0.26
Bolivia	63.62	70.77	60.91	0.48	0.01	74.68	0.96	0.09	0.65
Brazil	70.82	75.34	60.91	0.30	0.00	83.12	0.86	0.08	0.37
Bulgaria	71.99	74.80	60.91	0.19	0.00	84.00	0.85	0.07	0.23
Cambodia	60.30	69.12	60.91	0.59	0.01	80.41	1.01	0.04	0.44
Cameroon	51.60	58.27	60.91	0.44	0.01	68.81	1.18	0.06	0.39
Canada	79.52	81.92	60.91	0.16	0.00	84.00	0.77	0.05	0.54
Chile	76.89	79.84	60.91	0.20	0.00	84.00	0.79	0.06	0.42
China	72.05	76.33	60.91	0.29	0.00	84.00	0.85	0.04	0.36
Colombia	73.50	76.82	60.91	0.22	0.00	84.00	0.83	0.07	0.32
Costa Rica	77.73	79.83	60.91	0.14	0.00	84.00	0.78	0.09	0.33
Cote d'Ivoire	49.59	56.77	60.91	0.48	0.01	66.14	1.23	0.10	0.43
Croatia	74.43	77.80	60.91	0.22	0.00	84.00	0.82	0.06	0.35
Cyprus	78.26	80.59	60.91	0.16	0.00	84.00	0.78	0.05	0.41
Czech Republic	75.25	78.90	60.91	0.24	0.00	84.00	0.81	0.07	0.42
Denmark	76.98	80.90	60.91	0.26	0.00	84.00	0.79	0.08	0.56
Dominican Republic	69.96	73.57	60.91	0.24	0.00	82.12	0.87	0.11	0.30
Ecuador	73.35	76.47	60.91	0.21	0.00	84.00	0.83	0.08	0.29
Egypt, Arab Rep.	68.95	71.57	60.91	0.17	0.00	80.93	0.88	0.05	0.22
El Salvador	69.41	72.76	60.91	0.22	0.00	81.47	0.88	0.09	0.28
Estonia	70.96	77.89	60.91	0.46	0.01	83.29	0.86	0.09	0.56
Finland	78.13	81.57	60.91	0.23	0.00	84.00	0.78	0.06	0.59
France	79.35	82.55	60.91	0.21	0.00	84.00	0.77	0.08	0.69
Georgia	70.20	73.30	60.91	0.21	0.00	82.40	0.87	0.07	0.25
Germany	78.31	80.88	60.91	0.17	0.00	84.00	0.78	0.08	0.45
Ghana	57.52	63.28	60.91	0.38	0.01	76.71	1.06	0.07	0.30
Greece	78.56	81.38	60.91	0.19	0.00	84.00	0.78	0.05	0.52
Guatemala	68.68	73.67	60.91	0.33	0.00	80.61	0.89	0.07	0.42
Honduras	71.24	74.80	60.91	0.24	0.00	83.62	0.86	0.05	0.29
Hungary	72.16	75.88	60.91	0.25	0.00	84.00	0.84	0.07	0.31

India	63.30	69.02	60.91	0.38	0.01	74.30	0.96	0.04	0.52
Indonesia	66.35	71.15	60.91	0.32	0.00	77.87	0.92	0.07	0.42
Ireland	77.60	81.88	60.91	0.29	0.00	84.00	0.79	0.02	0.67
Israel	79.52	82.45	60.91	0.20	0.00	84.00	0.77	0.07	0.65
Jamaica	74.14	74.23	60.91	0.01	0.00	84.00	0.82	0.08	0.01
Jordan	72.08	74.24	60.91	0.14	0.00	84.00	0.85	0.06	0.18
Kazakhstan	65.80	72.60	60.91	0.45	0.01	77.24	0.93	0.05	0.59
Kenya	51.90	65.61	60.91	0.91	0.02	69.22	1.17	0.07	0.79
Korea, Rep.	76.79	82.39	60.91	0.37	0.00	84.00	0.79	0.04	0.78
Kyrgyz Republic	68.37	71.05	60.91	0.18	0.00	80.25	0.89	0.08	0.23
Latvia	71.07	74.62	60.91	0.24	0.00	83.41	0.86	0.09	0.29
Lithuania	71.89	75.04	60.91	0.21	0.00	84.00	0.85	0.08	0.26
Luxembourg	78.10	82.34	60.91	0.28	0.00	84.00	0.78	0.05	0.72
Malawi	45.74	62.93	60.91	1.15	0.03	60.99	1.33	0.11	1.13
Malaysia	72.98	75.73	60.91	0.18	0.00	84.00	0.83	0.06	0.25
Mali	49.59	58.21	60.91	0.57	0.01	66.14	1.23	0.05	0.52
Mexico	74.86	74.94	60.91	0.01	0.00	84.00	0.81	0.06	0.01
Moldova	67.35	71.66	60.91	0.29	0.00	79.05	0.90	0.11	0.37
Mongolia	63.77	69.41	60.91	0.38	0.01	74.85	0.96	0.05	0.51
Morocco	69.82	76.09	60.91	0.42	0.01	81.96	0.87	0.08	0.52
Mozambique	49.58	58.75	60.91	0.61	0.01	66.12	1.23	0.07	0.55
Namibia	51.13	62.78	60.91	0.78	0.02	68.18	1.19	0.09	0.68
Nepal	63.54	70.00	60.91	0.43	0.01	74.58	0.96	0.05	0.59
Netherlands	78.41	81.66	60.91	0.22	0.00	84.00	0.78	0.07	0.58
New Zealand	78.97	81.65	60.91	0.18	0.00	84.00	0.77	0.07	0.53
Nicaragua	70.27	73.96	60.91	0.25	0.00	82.48	0.87	0.08	0.30
Norway	79.13	82.52	60.91	0.23	0.00	84.00	0.77	0.05	0.70
Pakistan	63.29	66.85	60.91	0.24	0.00	74.29	0.96	0.05	0.32
Panama	75.40	78.05	60.91	0.18	0.00	84.00	0.81	0.08	0.31
Paraguay	71.01	73.91	60.91	0.19	0.00	83.35	0.86	0.04	0.23
Peru	71.86	76.16	60.91	0.29	0.00	84.00	0.85	0.06	0.35
Philippines	68.89	70.87	60.91	0.13	0.00	80.86	0.88	0.02	0.17
Poland	74.38	77.66	60.91	0.22	0.00	84.00	0.82	0.07	0.34
Portugal	77.02	81.25	60.91	0.28	0.00	84.00	0.79	0.06	0.61
Russian Federation	65.30	71.98	60.91	0.45	0.01	76.65	0.93	0.08	0.59
Senegal	58.76	67.22	60.91	0.56	0.01	78.36	1.04	0.08	0.43
Singapore	78.66	82.96	60.91	0.29	0.00	84.00	0.77	0.03	0.80
Slovak Republic	73.52	77.04	60.91	0.23	0.00	84.00	0.83	0.06	0.34
Slovenia	76.25	81.09	60.91	0.32	0.00	84.00	0.80	0.07	0.62
South Africa	54.53	63.30	60.91	0.58	0.01	72.72	1.12	0.08	0.48
Spain	79.48	83.22	60.91	0.25	0.00	84.00	0.77	0.07	0.83
Sri Lanka	72.96	76.56	60.91	0.24	0.00	84.00	0.83	0.07	0.33
Sweden	79.98	82.37	60.91	0.16	0.00	84.00	0.76	0.08	0.60
Tajikistan	63.65	70.52	60.91	0.46	0.01	74.71	0.96	0.06	0.62
Thailand	71.13	76.53	60.91	0.36	0.01	83.49	0.86	0.07	0.44
Togo	53.79	60.35	60.91	0.44	0.01	71.73	1.13	0.08	0.37
Tunisia	73.62	76.21	60.91	0.17	0.00	84.00	0.83	0.04	0.25
Turkey	71.04	77.00	60.91	0.40	0.01	83.39	0.86	0.05	0.48
Uganda	48.34	62.21	60.91	0.92	0.02	64.47	1.26	0.07	0.86
Ukraine	68.04	71.51	60.91	0.23	0.00	79.86	0.90	0.05	0.29

United Kingdom	78.21	81.16	60.91	0.20	0.00	84.00	0.78	0.05	0.51
United States	76.99	78.58	60.91	0.11	0.00	84.00	0.79	0.06	0.23
Uruguay	75.16	77.57	60.91	0.16	0.00	84.00	0.81	0.08	0.27
Venezuela, RB	72.45	72.34	60.91	-0.01	0.00	84.00	0.84	0.09	-0.01
Vietnam	73.44	75.21	60.91	0.12	0.00	84.00	0.83	0.06	0.17
Yemen, Rep.	61.79	66.09	60.91	0.29	0.00	72.53	0.99	0.04	0.40
Zambia	45.54	62.69	60.91	1.14	0.03	60.91	1.34	0.08	1.12
Zimbabwe	43.69	60.46	60.91	1.12	0.03	60.91	1.39	0.11	0.97

Source: Authors' calculations.

B. Indicators for the Dashboard of Sustainability⁴⁶

Greenhouse gas emissions (CO₂e/capita/year) (Production based)

Country	Current sustainability			Progress of sustainability				
	2000-2004 average value of greenhouse gas emissions = y^0	2015-2019 average value of greenhouse gas emissions = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	progress on greenhouse gas emissions
Albania	2.87	3.35	2.00	0.03	0.01	2.00	1.44	-0.55
Algeria	4.16	5.28	2.00	0.07	0.02	2.00	2.08	-0.52
Angola	3.37	3.22	2.00	-0.01	0.00	2.00	1.69	0.11
Argentina	7.91	8.69	2.00	0.05	0.01	2.00	3.96	-0.13
Armenia	2.04	3.15	2.00	0.07	0.04	1.50	1.02	-2.08
Australia	31.20	24.75	2.00	-0.43	-0.01	2.00	15.60	0.22
Austria	10.51	8.83	2.00	-0.11	-0.01	2.00	5.25	0.20
Azerbaijan	7.39	8.49	2.00	0.07	0.01	2.00	3.70	-0.20
Bangladesh	0.91	1.21	2.00	0.02	0.02	0.62	0.45	-1.03
Belarus	7.95	8.86	2.00	0.06	0.01	2.00	3.98	-0.15
Belgium	13.08	9.79	2.00	-0.22	-0.02	2.00	6.54	0.30
Benin	1.17	1.43	2.00	0.02	0.02	0.79	0.58	-0.70
Bolivia	3.77	4.98	2.00	0.08	0.02	2.00	1.89	-0.68
Botswana	8.66	6.84	2.00	-0.12	-0.01	2.00	4.33	0.27
Brazil	4.57	5.19	2.00	0.04	0.01	2.00	2.29	-0.24
Bulgaria	7.57	7.80	2.00	0.02	0.00	2.00	3.79	-0.04
Burkina Faso	1.49	1.59	2.00	0.01	0.00	1.10	0.74	-0.25
Cambodia	1.75	2.23	2.00	0.03	0.02	1.29	0.88	-1.04
Cameroon	5.04	3.72	2.00	-0.09	-0.02	2.00	2.52	0.43
Canada	21.89	19.45	2.00	-0.16	-0.01	2.00	10.95	0.12
Chile	4.58	5.88	2.00	0.09	0.02	2.00	2.29	-0.51
China	4.16	8.65	2.00	0.30	0.07	2.00	2.08	-2.07
Colombia	3.47	3.89	2.00	0.03	0.01	2.00	1.73	-0.28
Costa Rica	2.71	3.09	2.00	0.03	0.01	2.00	1.36	-0.54
Cote d'Ivoire	1.73	0.96	2.00	-0.05	-0.03	1.17	0.86	1.38
Croatia	6.22	5.42	2.00	-0.05	-0.01	2.00	3.11	0.19
Cyprus	8.61	7.17	2.00	-0.10	-0.01	2.00	4.31	0.22
Czech Republic	13.94	11.69	2.00	-0.15	-0.01	2.00	6.97	0.19
Denmark	13.05	8.22	2.00	-0.32	-0.02	2.00	6.53	0.44
Dominican Republic	3.27	3.58	2.00	0.02	0.01	2.00	1.63	-0.24
Ecuador	3.52	4.00	2.00	0.03	0.01	2.00	1.76	-0.32
Egypt, Arab Rep.	2.78	3.29	2.00	0.03	0.01	2.00	1.39	-0.66
El Salvador	1.95	2.00	2.00	0.00	0.00	1.44	0.98	-0.09
Estonia	13.35	14.18	2.00	0.06	0.00	2.00	6.67	-0.07
Ethiopia	1.32	1.60	2.00	0.02	0.01	0.98	0.66	-0.79
Finland	14.78	10.04	2.00	-0.32	-0.02	2.00	7.39	0.37

⁴⁶ To avoid repetition, the information about emissions of nitrogen and Inclusive Wealth Index will be shown in Annex II.

France	8.10	6.17	2.00	-0.13	-0.02	2.00	4.05	0.32
Gambia, The	1.54	1.29	2.00	-0.02	-0.01	1.14	0.77	0.62
Georgia	2.99	4.57	2.00	0.11	0.04	2.00	1.50	-1.59
Germany	11.80	10.35	2.00	-0.10	-0.01	2.00	5.90	0.15
Ghana	1.09	1.49	2.00	0.03	0.02	0.74	0.55	-1.12
Greece	11.00	8.11	2.00	-0.19	-0.02	2.00	5.50	0.32
Guatemala	1.84	2.16	2.00	0.02	0.01	1.36	0.92	-0.65
Honduras	2.16	2.36	2.00	0.01	0.01	1.59	1.08	-0.35
Hungary	7.15	5.99	2.00	-0.08	-0.01	2.00	3.58	0.23
India	1.63	2.34	2.00	0.05	0.03	1.20	0.81	-1.67
Indonesia	3.17	3.31	2.00	0.01	0.00	2.00	1.58	-0.12
Ireland	18.45	13.67	2.00	-0.32	-0.02	2.00	9.23	0.29
Israel	11.48	10.65	2.00	-0.06	0.00	2.00	5.74	0.09
Italy	9.07	6.69	2.00	-0.16	-0.02	2.00	4.54	0.34
Jamaica	4.49	3.10	2.00	-0.09	-0.02	2.00	2.24	0.56
Japan	9.86	9.92	2.00	0.00	0.00	2.00	4.93	-0.01
Jordan	3.99	3.76	2.00	-0.02	0.00	2.00	2.00	0.12
Kazakhstan	11.16	16.25	2.00	0.34	0.03	2.00	5.58	-0.56
Kenya	1.21	1.57	2.00	0.02	0.02	0.82	0.60	-0.93
Korea, Rep.	11.11	13.53	2.00	0.16	0.01	2.00	5.55	-0.27
Kyrgyz Republic	2.02	2.84	2.00	0.05	0.03	1.49	1.01	-1.55
Latvia	4.75	5.79	2.00	0.07	0.01	2.00	2.38	-0.38
Lithuania	5.86	6.54	2.00	0.05	0.01	2.00	2.93	-0.18
Luxembourg	24.07	17.21	2.00	-0.46	-0.02	2.00	12.03	0.31
Malawi	0.81	0.93	2.00	0.01	0.01	0.55	0.41	-0.46
Malaysia	7.56	9.62	2.00	0.14	0.02	2.00	3.78	-0.37
Mali	2.08	2.20	2.00	0.01	0.00	1.41	1.04	-0.17
Mexico	5.36	5.48	2.00	0.01	0.00	2.00	2.68	-0.04
Moldova	4.11	4.56	2.00	0.03	0.01	2.00	2.05	-0.21
Mongolia	10.93	15.47	2.00	0.30	0.03	2.00	5.47	-0.51
Morocco	1.96	2.57	2.00	0.04	0.02	1.44	0.98	-1.19
Mozambique	1.29	1.31	2.00	0.00	0.00	0.88	0.65	-0.03
Namibia	5.84	5.31	2.00	-0.04	-0.01	2.00	2.92	0.14
Nepal	1.25	1.67	2.00	0.03	0.02	0.85	0.62	-1.05
Netherlands	12.90	11.02	2.00	-0.13	-0.01	2.00	6.45	0.17
New Zealand	20.45	17.42	2.00	-0.20	-0.01	2.00	10.22	0.16
Nicaragua	2.58	3.04	2.00	0.03	0.01	1.90	1.29	-0.68
Norway	10.65	9.02	2.00	-0.11	-0.01	2.00	5.33	0.19
Pakistan	1.61	1.84	2.00	0.02	0.01	1.09	0.81	-0.44
Panama	3.51	4.68	2.00	0.08	0.02	2.00	1.76	-0.77
Paraguay	5.90	7.00	2.00	0.07	0.01	2.00	2.95	-0.28
Peru	2.32	3.12	2.00	0.05	0.02	1.71	1.16	-1.32
Philippines	1.78	1.97	2.00	0.01	0.01	1.31	0.89	-0.41
Poland	9.76	9.79	2.00	0.00	0.00	2.00	4.88	0.00
Portugal	7.65	6.52	2.00	-0.08	-0.01	2.00	3.83	0.20
Romania	6.37	5.41	2.00	-0.06	-0.01	2.00	3.19	0.22
Russian Federation	15.60	16.86	2.00	0.08	0.01	2.00	7.80	-0.09
Senegal	1.95	1.99	2.00	0.00	0.00	1.33	0.98	-0.05
Singapore	13.00	11.18	2.00	-0.12	-0.01	2.00	6.50	0.17
Slovak Republic	8.62	7.03	2.00	-0.11	-0.01	2.00	4.31	0.24

Slovenia	9.50	8.10	2.00	-0.09	-0.01	2.00	4.75	0.19
South Africa	8.54	8.86	2.00	0.02	0.00	2.00	4.27	-0.05
Spain	9.26	6.91	2.00	-0.16	-0.02	2.00	4.63	0.32
Sri Lanka	1.16	1.62	2.00	0.03	0.03	0.86	0.58	-1.49
Sweden	7.55	5.06	2.00	-0.17	-0.02	2.00	3.78	0.45
Switzerland	7.31	5.76	2.00	-0.10	-0.01	2.00	3.65	0.29
Tajikistan	1.08	1.51	2.00	0.03	0.03	0.80	0.54	-1.50
Tanzania	1.61	2.00	2.00	0.03	0.02	1.19	0.80	-0.93
Thailand	4.38	5.74	2.00	0.09	0.02	2.00	2.19	-0.57
Togo	1.07	1.17	2.00	0.01	0.01	0.73	0.54	-0.30
Tunisia	3.19	3.56	2.00	0.02	0.01	2.00	1.60	-0.30
Turkey	4.28	5.65	2.00	0.09	0.02	2.00	2.14	-0.60
Uganda	1.00	1.35	2.00	0.02	0.02	0.68	0.50	-1.07
Ukraine	9.11	6.31	2.00	-0.19	-0.02	2.00	4.55	0.39
United Kingdom	11.60	7.43	2.00	-0.28	-0.02	2.00	5.80	0.43
United States	23.52	18.50	2.00	-0.33	-0.01	2.00	11.76	0.23
Uruguay	9.91	10.80	2.00	0.06	0.01	2.00	4.96	-0.11
Venezuela, RB	9.01	8.77	2.00	-0.02	0.00	2.00	4.51	0.03
Vietnam	1.88	3.48	2.00	0.11	0.06	1.39	0.94	-3.24
Yemen, Rep.	1.35	0.92	2.00	-0.03	-0.02	0.92	0.68	1.00
Zambia	2.76	2.55	2.00	-0.01	-0.01	1.87	1.38	0.24
Zimbabwe	2.47	2.19	2.00	-0.02	-0.01	1.68	1.23	0.35

Source: Authors' calculations.

Carbon footprint (CO₂e/capita/year)

Country	Current sustainability			Progress of sustainability				
	2000-2004 average value of greenhouse gas emissions = y^0	2015-2019 average value of greenhouse gas emissions = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	progress on carbon footprint
Albania	3.10	4.43	2.00	0.09	0.03	2.00	1.55	-1.22
Algeria	3.14	3.99	2.00	0.06	0.02	2.00	1.57	-0.75
Angola	4.20	3.72	2.00	-0.03	-0.01	2.00	2.10	0.22
Argentina	7.71	8.03	2.00	0.02	0.00	2.00	3.85	-0.06
Armenia	2.65	4.70	2.00	0.14	0.05	2.00	1.33	-3.13
Australia	25.28	23.83	2.00	-0.10	0.00	2.00	12.64	0.06
Austria	15.84	13.93	2.00	-0.13	-0.01	2.00	7.92	0.14
Azerbaijan	4.90	6.69	2.00	0.12	0.02	2.00	2.45	-0.62
Bangladesh	0.72	1.07	2.00	0.02	0.03	0.53	0.36	-1.88
Belarus	0.80	0.85	2.00	0.00	0.00	0.61	0.40	-0.27
Belgium	15.59	12.40	2.00	-0.21	-0.01	2.00	7.79	0.23
Benin	1.27	1.62	2.00	0.02	0.02	0.93	0.63	-1.05
Bolivia	4.88	6.55	2.00	0.11	0.02	2.00	2.44	-0.58
Botswana	11.26	12.14	2.00	0.06	0.01	2.00	5.63	-0.10
Brazil	5.52	6.45	2.00	0.06	0.01	2.00	2.76	-0.27
Bulgaria	6.18	6.68	2.00	0.03	0.01	2.00	3.09	-0.12
Burkina Faso	1.42	1.92	2.00	0.03	0.02	1.01	0.71	-1.23
Cambodia	1.35	1.81	2.00	0.03	0.02	1.03	0.68	-1.42
Cameroon	2.48	1.83	2.00	-0.04	-0.02	1.83	1.24	1.00
Canada	22.18	22.29	2.00	0.01	0.00	2.00	11.09	-0.01
Chile	5.03	6.87	2.00	0.12	0.02	2.00	2.51	-0.61
China	3.96	8.50	2.00	0.30	0.08	2.00	1.98	-2.31
Colombia	4.66	5.45	2.00	0.05	0.01	2.00	2.33	-0.29
Costa Rica	3.37	4.15	2.00	0.05	0.02	2.00	1.69	-0.57
Cote d'Ivoire	1.04	0.93	2.00	-0.01	-0.01	0.77	0.52	0.43
Croatia	7.91	7.80	2.00	-0.01	0.00	2.00	3.95	0.02
Cyprus	14.15	12.17	2.00	-0.13	-0.01	2.00	7.07	0.16
Czech Republic	14.45	12.70	2.00	-0.12	-0.01	2.00	7.23	0.14
Denmark	17.49	13.38	2.00	-0.27	-0.02	2.00	8.74	0.27
Dominican Republic	3.10	3.54	2.00	0.03	0.01	2.00	1.55	-0.40
Ecuador	4.11	4.86	2.00	0.05	0.01	2.00	2.06	-0.35
Egypt, Arab Rep.	2.85	3.17	2.00	0.02	0.01	2.00	1.42	-0.38
El Salvador	2.58	2.85	2.00	0.02	0.01	1.97	1.29	-0.42
Estonia	15.08	15.45	2.00	0.02	0.00	2.00	7.54	-0.03
Ethiopia	0.59	0.16	2.00	-0.03	-0.05	0.42	0.30	2.55
Finland	17.56	13.27	2.00	-0.29	-0.02	2.00	8.78	0.28
France	13.75	10.80	2.00	-0.20	-0.01	2.00	6.87	0.25
Gambia, The	1.48	1.48	2.00	0.00	0.00	1.05	0.74	-0.02
Georgia	4.45	7.30	2.00	0.19	0.04	2.00	2.22	-1.17
Germany	16.05	13.80	2.00	-0.15	-0.01	2.00	8.02	0.16

Ghana	0.80	1.12	2.00	0.02	0.03	0.59	0.40	-1.50
Greece	18.32	13.31	2.00	-0.33	-0.02	2.00	9.16	0.31
Guatemala	1.79	2.08	2.00	0.02	0.01	1.36	0.89	-0.69
Honduras	1.81	2.17	2.00	0.02	0.01	1.38	0.91	-0.81
Hungary	8.82	7.36	2.00	-0.10	-0.01	2.00	4.41	0.21
India	1.56	2.08	2.00	0.03	0.02	1.19	0.78	-1.38
Indonesia	2.63	2.88	2.00	0.02	0.01	2.00	1.31	-0.39
Ireland	17.66	13.44	2.00	-0.28	-0.02	2.00	8.83	0.27
Israel	16.31	12.89	2.00	-0.23	-0.01	2.00	8.16	0.24
Italy	14.09	10.29	2.00	-0.25	-0.02	2.00	7.04	0.31
Jamaica	5.75	4.76	2.00	-0.07	-0.01	2.00	2.88	0.26
Japan	16.16	15.15	2.00	-0.07	0.00	2.00	8.08	0.07
Jordan	5.04	3.85	2.00	-0.08	-0.02	2.00	2.52	0.39
Kazakhstan	12.02	17.21	2.00	0.35	0.03	2.00	6.01	-0.52
Kenya	1.79	2.10	2.00	0.02	0.01	1.32	0.89	-0.68
Korea, Rep.	13.44	15.71	2.00	0.15	0.01	2.00	6.72	-0.20
Kyrgyz Republic	2.88	4.43	2.00	0.10	0.04	2.00	1.44	-1.77
Latvia	7.87	9.96	2.00	0.14	0.02	2.00	3.93	-0.36
Lithuania	9.48	11.36	2.00	0.13	0.01	2.00	4.74	-0.25
Luxembourg	43.84	39.71	2.00	-0.27	-0.01	2.00	21.92	0.10
Malawi	0.59	0.61	2.00	0.00	0.00	0.44	0.30	-0.10
Malaysia	8.92	11.45	2.00	0.17	0.02	2.00	4.46	-0.37
Mali	1.72	2.19	2.00	0.03	0.02	1.26	0.86	-1.04
Mexico	6.34	6.37	2.00	0.00	0.00	2.00	3.17	-0.01
Moldova	0.71	1.55	2.00	0.06	0.08	0.54	0.36	-4.89
Mongolia	3.93	8.46	2.00	0.30	0.08	2.00	1.96	-2.35
Morocco	1.90	2.91	2.00	0.07	0.04	1.45	0.95	-2.21
Mozambique	1.17	1.45	2.00	0.02	0.02	0.86	0.58	-0.91
Namibia	6.12	6.64	2.00	0.04	0.01	2.00	3.06	-0.13
Nepal	0.97	1.48	2.00	0.03	0.03	0.72	0.49	-1.98
Netherlands	17.62	15.49	2.00	-0.14	-0.01	2.00	8.81	0.14
New Zealand	18.00	16.26	2.00	-0.12	-0.01	2.00	9.00	0.11
Nicaragua	2.16	2.47	2.00	0.02	0.01	1.64	1.08	-0.60
Norway	17.70	18.10	2.00	0.03	0.00	2.00	8.85	-0.03
Pakistan	1.73	1.91	2.00	0.01	0.01	1.28	0.87	-0.39
Panama	4.44	5.38	2.00	0.06	0.01	2.00	2.22	-0.38
Paraguay	6.32	9.43	2.00	0.21	0.03	2.00	3.16	-0.72
Peru	2.94	4.34	2.00	0.09	0.03	2.00	1.47	-1.50
Philippines	2.22	2.27	2.00	0.00	0.00	1.69	1.11	-0.08
Poland	10.67	11.31	2.00	0.04	0.00	2.00	5.34	-0.07
Portugal	12.32	9.74	2.00	-0.17	-0.01	2.00	6.16	0.25
Romania	6.87	7.15	2.00	0.02	0.00	2.00	3.43	-0.06
Russian Federation	14.21	17.62	2.00	0.23	0.02	2.00	7.10	-0.28
Senegal	1.45	1.65	2.00	0.01	0.01	1.06	0.72	-0.53
Singapore	30.03	38.72	2.00	0.58	0.02	2.00	15.02	-0.31
Slovak Republic	12.33	11.91	2.00	-0.03	0.00	2.00	6.17	0.04
Slovenia	12.48	11.03	2.00	-0.10	-0.01	2.00	6.24	0.14
South Africa	8.61	8.26	2.00	-0.02	0.00	2.00	4.31	0.05
Spain	13.77	10.31	2.00	-0.23	-0.02	2.00	6.88	0.29
Sri Lanka	1.04	1.75	2.00	0.05	0.05	0.79	0.52	-2.85

Sweden	12.49	10.71	2.00	-0.12	-0.01	2.00	6.24	0.17
Switzerland	17.75	16.09	2.00	-0.11	-0.01	2.00	8.87	0.11
Tajikistan	0.86	1.32	2.00	0.03	0.04	0.66	0.43	-2.25
Tanzania	1.20	1.32	2.00	0.01	0.01	0.86	0.60	-0.34
Thailand	4.49	6.40	2.00	0.13	0.03	2.00	2.25	-0.77
Togo	1.25	1.38	2.00	0.01	0.01	0.92	0.63	-0.40
Tunisia	3.42	3.57	2.00	0.01	0.00	2.00	1.71	-0.11
Turkey	5.74	7.71	2.00	0.13	0.02	2.00	2.87	-0.53
Uganda	0.96	1.27	2.00	0.02	0.02	0.71	0.48	-1.19
Ukraine	6.47	6.77	2.00	0.02	0.00	2.00	3.24	-0.07
United Kingdom	18.57	13.94	2.00	-0.31	-0.02	2.00	9.29	0.28
United States	30.68	24.88	2.00	-0.39	-0.01	2.00	15.34	0.20
Uruguay	11.09	14.14	2.00	0.20	0.02	2.00	5.54	-0.34
Venezuela, RB	10.01	9.58	2.00	-0.03	0.00	2.00	5.01	0.05
Vietnam	2.23	3.60	2.00	0.09	0.04	1.70	1.11	-2.56
Yemen, Rep.	1.77	2.10	2.00	0.02	0.01	1.30	0.88	-0.71
Zambia	2.45	2.12	2.00	-0.02	-0.01	1.81	1.23	0.51
Zimbabwe	2.22	0.61	2.00	-0.11	-0.05	1.64	1.11	2.76

Source: Authors' calculations.

Water stress Consumption based (Mio m3 H2Oeq/1000 capita/year)

Country	Current sustainability			Progress of sustainability				
	2000-2004 average value of greenhouse gas emissions = y^0	2015-2019 average value of greenhouse gas emissions = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	progress on Water stress Consumption based
Albania	2.31	1.35	6.47	-0.06	-0.03	1.35	0.36	1.00
Algeria	5.20	5.20	6.47	0.00	0.00	3.46	0.80	0.00
Angola	0.27	0.42	6.47	0.01	0.04	0.17	0.04	-1.60
Argentina	1.45	1.64	6.47	0.01	0.01	0.97	0.22	-0.37
Armenia	3.91	5.33	6.47	0.09	0.02	2.29	0.60	-0.88
Australia	10.38	8.50	6.47	-0.13	-0.01	6.47	1.60	0.48
Austria	5.09	4.77	6.47	-0.02	0.00	3.38	0.79	0.19
Azerbaijan	2.84	5.19	6.47	0.16	0.06	1.66	0.44	-2.00
Bangladesh	0.12	0.19	6.47	0.00	0.04	0.08	0.02	-1.75
Belarus	0.06	0.03	6.47	0.00	-0.03	0.04	0.01	1.11
Belgium	7.47	8.04	6.47	0.04	0.01	4.96	1.15	-0.23
Benin	0.38	0.33	6.47	0.00	-0.01	0.24	0.06	0.37
Bolivia	0.42	0.49	6.47	0.00	0.01	0.28	0.06	-0.51
Botswana	1.96	1.48	6.47	-0.03	-0.02	1.30	0.30	0.73
Brazil	0.40	0.57	6.47	0.01	0.03	0.23	0.06	-1.05
Bulgaria	1.56	2.14	6.47	0.04	0.02	0.91	0.24	-0.89
Burkina Faso	0.28	0.44	6.47	0.01	0.04	0.18	0.04	-1.74
Cambodia	0.17	0.22	6.47	0.00	0.02	0.11	0.03	-0.84
Cameroon	0.35	0.30	6.47	0.00	-0.01	0.23	0.05	0.40
Canada	4.67	4.92	6.47	0.02	0.00	3.10	0.72	-0.16
Chile	4.26	4.91	6.47	0.04	0.01	2.83	0.66	-0.45
China	3.28	5.11	6.47	0.12	0.04	1.92	0.51	-1.34
Colombia	0.63	1.10	6.47	0.03	0.05	0.37	0.10	-1.80
Costa Rica	0.95	1.42	6.47	0.03	0.03	0.56	0.15	-1.19
Cote d'Ivoire	0.30	0.25	6.47	0.00	-0.01	0.20	0.05	0.50
Croatia	2.22	2.11	6.47	-0.01	0.00	1.47	0.34	0.14
Cyprus	19.91	11.05	6.47	-0.59	-0.03	6.47	3.08	0.66
Czech Republic	2.26	3.15	6.47	0.06	0.03	1.50	0.35	-1.16
Denmark	5.09	3.83	6.47	-0.08	-0.02	3.38	0.79	0.74
Dominican Republic	2.23	3.31	6.47	0.07	0.03	1.48	0.35	-1.44
Ecuador	0.89	0.99	6.47	0.01	0.01	0.52	0.14	-0.27
Egypt, Arab Rep.	40.35	19.18	6.47	-1.41	-0.03	6.47	6.23	0.62
El Salvador	0.47	0.70	6.47	0.02	0.03	0.31	0.07	-1.45
Estonia	2.27	4.44	6.47	0.14	0.06	1.51	0.35	-2.85
Ethiopia	0.03	0.05	6.47	0.00	0.05	0.02	0.00	-2.35
Finland	3.97	4.10	6.47	0.01	0.00	2.64	0.61	-0.10
France	6.61	5.81	6.47	-0.05	-0.01	4.39	1.02	0.36
Gambia, The	0.67	0.46	6.47	-0.01	-0.02	0.44	0.10	0.89
Georgia	3.38	4.24	6.47	0.06	0.02	1.98	0.52	-0.61
Germany	6.74	7.70	6.47	0.06	0.01	4.48	1.04	-0.42

Ghana	0.34	0.36	6.47	0.00	0.00	0.22	0.05	-0.19
Greece	25.29	14.14	6.47	-0.74	-0.03	6.47	3.91	0.59
Guatemala	0.32	0.43	6.47	0.01	0.02	0.21	0.05	-1.03
Honduras	0.31	0.43	6.47	0.01	0.03	0.20	0.05	-1.21
Hungary	1.67	1.38	6.47	-0.02	-0.01	1.11	0.26	0.52
India	5.66	6.10	6.47	0.03	0.01	3.76	0.87	-0.23
Indonesia	1.56	1.76	6.47	0.01	0.01	1.03	0.24	-0.39
Ireland	6.40	4.83	6.47	-0.10	-0.02	4.25	0.99	0.73
Israel	8.47	5.65	6.47	-0.19	-0.02	5.63	1.31	0.99
Italy	10.35	7.30	6.47	-0.20	-0.02	6.47	1.60	0.79
Jamaica	1.23	1.54	6.47	0.02	0.02	0.72	0.19	-0.60
Japan	3.01	2.37	6.47	-0.04	-0.01	2.00	0.47	0.64
Jordan	7.19	4.21	6.47	-0.20	-0.03	4.21	1.11	1.00
Kazakhstan	4.90	5.26	6.47	0.02	0.00	2.87	0.76	-0.18
Kenya	1.88	3.04	6.47	0.08	0.04	1.22	0.29	-1.74
Korea, Rep.	4.56	3.80	6.47	-0.05	-0.01	3.03	0.70	0.50
Kyrgyz Republic	3.79	3.45	6.47	-0.02	-0.01	2.52	0.59	0.27
Latvia	1.24	2.61	6.47	0.09	0.07	0.72	0.19	-2.67
Lithuania	1.73	4.42	6.47	0.18	0.10	1.15	0.27	-4.60
Luxembourg	21.25	24.78	6.47	0.24	0.01	6.47	3.28	-0.24
Malawi	0.20	0.17	6.47	0.00	-0.01	0.13	0.03	0.46
Malaysia	4.82	5.67	6.47	0.06	0.01	2.82	0.74	-0.43
Mali	0.93	1.09	6.47	0.01	0.01	0.61	0.14	-0.49
Mexico	4.44	3.35	6.47	-0.07	-0.02	2.60	0.69	0.59
Moldova	0.14	0.19	6.47	0.00	0.02	0.10	0.02	-0.88
Mongolia	0.45	1.15	6.47	0.05	0.10	0.30	0.07	-4.53
Morocco	7.52	5.88	6.47	-0.11	-0.01	4.99	1.16	0.65
Mozambique	0.14	0.11	6.47	0.00	-0.01	0.09	0.02	0.55
Namibia	1.30	1.16	6.47	-0.01	-0.01	0.87	0.20	0.32
Nepal	0.36	0.36	6.47	0.00	0.00	0.23	0.06	0.01
Netherlands	13.08	11.69	6.47	-0.09	-0.01	6.47	2.02	0.21
New Zealand	3.76	4.30	6.47	0.04	0.01	2.50	0.58	-0.43
Nicaragua	0.19	0.25	6.47	0.00	0.02	0.13	0.03	-1.02
Norway	9.31	8.94	6.47	-0.02	0.00	6.18	1.44	0.12
Pakistan	6.50	4.54	6.47	-0.13	-0.02	4.21	1.00	0.86
Panama	1.33	1.81	6.47	0.03	0.02	0.78	0.21	-0.86
Paraguay	0.56	0.79	6.47	0.02	0.03	0.37	0.09	-1.27
Peru	1.92	2.14	6.47	0.01	0.01	1.12	0.30	-0.28
Philippines	0.37	0.34	6.47	0.00	-0.01	0.25	0.06	0.25
Poland	1.35	2.03	6.47	0.05	0.03	0.90	0.21	-1.49
Portugal	13.01	9.59	6.47	-0.23	-0.02	6.47	2.01	0.52
Romania	1.24	1.77	6.47	0.04	0.03	0.81	0.19	-1.22
Russian Federation	2.12	3.42	6.47	0.09	0.04	1.24	0.33	-1.49
Senegal	2.70	3.12	6.47	0.03	0.01	1.75	0.42	-0.43
Singapore	12.96	16.99	6.47	0.27	0.02	6.47	2.00	-0.62
Slovak Republic	2.13	2.75	6.47	0.04	0.02	1.41	0.33	-0.87
Slovenia	2.90	4.68	6.47	0.12	0.04	1.92	0.45	-1.83
South Africa	2.09	1.39	6.47	-0.05	-0.02	1.39	0.32	1.00
Spain	25.13	16.34	6.47	-0.59	-0.02	6.47	3.88	0.47
Sri Lanka	0.59	0.66	6.47	0.00	0.01	0.34	0.09	-0.27

Sweden	4.83	5.76	6.47	0.06	0.01	3.21	0.75	-0.58
Switzerland	7.50	7.54	6.47	0.00	0.00	4.98	1.16	-0.01
Tajikistan	0.82	1.48	6.47	0.04	0.05	0.54	0.13	-2.43
Tanzania	0.42	0.38	6.47	0.00	-0.01	0.28	0.06	0.29
Thailand	0.82	1.01	6.47	0.01	0.01	0.48	0.13	-0.54
Togo	0.29	0.29	6.47	0.00	0.00	0.19	0.05	0.06
Tunisia	17.39	19.39	6.47	0.13	0.01	6.47	2.69	-0.18
Turkey	8.11	7.44	6.47	-0.04	-0.01	4.74	1.25	0.20
Uganda	2.48	2.19	6.47	-0.02	-0.01	1.60	0.38	0.32
Ukraine	0.94	0.92	6.47	0.00	0.00	0.55	0.14	0.03
United Kingdom	6.47	5.70	6.47	-0.05	-0.01	4.30	1.00	0.36
United States	9.13	7.16	6.47	-0.13	-0.01	6.06	1.41	0.64
Uruguay	1.04	1.74	6.47	0.05	0.05	0.61	0.16	-1.64
Venezuela, RB	0.84	1.03	6.47	0.01	0.02	0.49	0.13	-0.55
Vietnam	0.38	0.44	6.47	0.00	0.01	0.25	0.06	-0.49
Yemen, Rep.	3.38	2.19	6.47	-0.08	-0.02	2.19	0.52	1.00
Zambia	0.30	0.30	6.47	0.00	0.00	0.20	0.05	0.05
Zimbabwe	0.32	0.11	6.47	-0.01	-0.04	0.21	0.05	1.88

Source: Authors' calculations.

Water stress Production based (Mio m3 H2Oeq/1000 capita/year)

Country	Current sustainability			Progress of sustainability				
	2000-2004 average value of greenhouse gas emissions = y^0	2015-2019 average value of greenhouse gas emissions = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	progress on Water stress Production based
Albania	2.11	2.01	2.63	-0.01	0.00	1.00	0.80	0.10
Algeria	4.42	2.54	2.63	-0.13	-0.03	2.10	1.68	0.81
Angola	0.06	0.04	2.63	0.00	-0.03	0.03	0.02	0.75
Argentina	2.51	2.05	2.63	-0.03	-0.01	1.19	0.95	0.35
Armenia	7.67	6.90	2.63	-0.05	-0.01	2.63	2.91	0.15
Australia	10.93	8.04	2.63	-0.19	-0.02	2.63	4.15	0.35
Austria	0.06	0.04	2.63	0.00	-0.01	0.03	0.02	0.39
Azerbaijan	8.78	7.88	2.63	-0.06	-0.01	2.63	3.33	0.15
Bangladesh	0.06	0.04	2.63	0.00	-0.02	0.03	0.02	0.59
Belarus	0.12	0.34	2.63	0.02	0.13	0.05	0.04	-3.76
Belgium	0.14	0.12	2.63	0.00	-0.01	0.07	0.05	0.27
Benin	0.14	0.11	2.63	0.00	-0.02	0.07	0.05	0.48
Bolivia	0.10	0.09	2.63	0.00	-0.01	0.05	0.04	0.18
Botswana	0.79	0.23	2.63	-0.04	-0.05	0.37	0.30	1.36
Brazil	0.15	0.17	2.63	0.00	0.01	0.07	0.06	-0.35
Bulgaria	0.88	1.00	2.63	0.01	0.01	0.42	0.33	-0.25
Burkina Faso	0.20	0.15	2.63	0.00	-0.02	0.09	0.08	0.48
Cambodia	0.20	0.13	2.63	0.00	-0.02	0.09	0.07	0.65
Cameroon	0.14	0.10	2.63	0.00	-0.02	0.07	0.05	0.48
Canada	0.36	0.25	2.63	-0.01	-0.02	0.17	0.14	0.60
Chile	12.64	11.61	2.63	-0.07	-0.01	2.63	4.80	0.10
China	4.02	6.00	2.63	0.13	0.03	1.91	1.53	-0.94
Colombia	0.04	0.04	2.63	0.00	0.00	0.02	0.02	0.13
Costa Rica	0.19	0.15	2.63	0.00	-0.01	0.09	0.07	0.35
Cote d'Ivoire	0.32	0.27	2.63	0.00	-0.01	0.15	0.12	0.34
Croatia	0.37	0.29	2.63	0.00	-0.01	0.17	0.14	0.38
Cyprus	21.39	7.99	2.63	-0.89	-0.04	2.63	8.12	0.71
Czech Republic	0.03	0.03	2.63	0.00	0.00	0.02	0.01	-0.12
Denmark	0.22	0.16	2.63	0.00	-0.02	0.10	0.08	0.47
Dominican Republic	2.18	2.65	2.63	0.03	0.01	1.04	0.83	-0.40
Ecuador	0.89	0.71	2.63	-0.01	-0.01	0.42	0.34	0.37
Egypt, Arab Rep.	67.38	45.94	2.63	-1.43	-0.02	2.63	25.58	0.33
El Salvador	0.04	0.03	2.63	0.00	-0.01	0.02	0.01	0.26
Estonia	0.02	0.02	2.63	0.00	0.02	0.01	0.01	-0.57
Ethiopia	0.34	0.39	2.63	0.00	0.01	0.15	0.13	-0.26
Finland	0.16	0.06	2.63	-0.01	-0.04	0.08	0.06	1.15
France	0.38	0.26	2.63	-0.01	-0.02	0.18	0.14	0.59
Gambia, The	0.09	0.08	2.63	0.00	-0.01	0.04	0.03	0.22
Georgia	4.22	3.82	2.63	-0.03	-0.01	2.00	1.60	0.18
Germany	0.04	0.04	2.63	0.00	0.00	0.02	0.01	0.00

Ghana	0.45	0.33	2.63	-0.01	-0.02	0.22	0.17	0.53
Greece	24.46	13.70	2.63	-0.72	-0.03	2.63	9.28	0.49
Guatemala	0.03	0.03	2.63	0.00	-0.01	0.02	0.01	0.43
Honduras	0.03	0.02	2.63	0.00	-0.02	0.01	0.01	0.45
Hungary	0.05	0.03	2.63	0.00	-0.02	0.02	0.02	0.49
India	6.04	6.45	2.63	0.03	0.00	2.63	2.29	-0.12
Indonesia	1.30	1.47	2.63	0.01	0.01	0.62	0.50	-0.25
Ireland	0.07	0.07	2.63	0.00	-0.01	0.04	0.03	0.22
Israel	8.32	5.70	2.63	-0.18	-0.02	2.63	3.16	0.46
Italy	2.76	1.81	2.63	-0.06	-0.02	1.31	1.05	0.65
Jamaica	0.40	0.35	2.63	0.00	-0.01	0.19	0.15	0.23
Japan	0.02	0.01	2.63	0.00	-0.03	0.01	0.01	0.81
Jordan	3.92	2.05	2.63	-0.12	-0.03	1.86	1.49	0.91
Kazakhstan	5.56	4.72	2.63	-0.06	-0.01	2.63	2.11	0.29
Kenya	0.45	0.31	2.63	-0.01	-0.02	0.22	0.17	0.61
Korea, Rep.	0.04	0.05	2.63	0.00	0.02	0.02	0.02	-0.43
Kyrgyz Republic	6.20	4.77	2.63	-0.10	-0.02	2.63	2.35	0.40
Latvia	0.03	0.02	2.63	0.00	-0.01	0.01	0.01	0.15
Lithuania	0.03	0.03	2.63	0.00	0.01	0.01	0.01	-0.21
Luxembourg	0.01	0.01	2.63	0.00	-0.02	0.01	0.00	0.65
Malawi	0.07	0.04	2.63	0.00	-0.03	0.03	0.03	0.81
Malaysia	0.02	0.01	2.63	0.00	-0.03	0.01	0.01	0.76
Mali	1.14	1.22	2.63	0.00	0.00	0.54	0.43	-0.12
Mexico	4.33	3.96	2.63	-0.02	-0.01	2.06	1.64	0.16
Moldova	0.39	0.74	2.63	0.02	0.06	0.19	0.15	-1.66
Mongolia	0.70	1.11	2.63	0.03	0.04	0.33	0.27	-1.11
Morocco	11.86	9.39	2.63	-0.16	-0.01	2.63	4.50	0.27
Mozambique	0.06	0.05	2.63	0.00	-0.01	0.03	0.02	0.33
Namibia	0.52	0.17	2.63	-0.02	-0.04	0.25	0.20	1.28
Nepal	0.60	0.45	2.63	-0.01	-0.02	0.28	0.23	0.48
Netherlands	0.07	0.08	2.63	0.00	0.01	0.03	0.03	-0.20
New Zealand	0.59	0.32	2.63	-0.02	-0.03	0.28	0.22	0.85
Nicaragua	0.03	0.03	2.63	0.00	-0.01	0.02	0.01	0.23
Norway	0.05	0.04	2.63	0.00	-0.02	0.03	0.02	0.52
Pakistan	12.05	8.13	2.63	-0.26	-0.02	2.63	4.57	0.42
Panama	0.04	0.03	2.63	0.00	-0.01	0.02	0.01	0.23
Paraguay	0.06	0.06	2.63	0.00	0.00	0.03	0.02	-0.09
Peru	2.19	2.06	2.63	-0.01	0.00	1.04	0.83	0.11
Philippines	0.16	0.11	2.63	0.00	-0.02	0.08	0.06	0.61
Poland	0.11	0.12	2.63	0.00	0.01	0.05	0.04	-0.23
Portugal	9.31	5.77	2.63	-0.24	-0.03	2.63	3.53	0.53
Romania	0.21	0.24	2.63	0.00	0.01	0.09	0.08	-0.29
Russian Federation	0.50	0.53	2.63	0.00	0.00	0.24	0.19	-0.10
Senegal	3.78	3.62	2.63	-0.01	0.00	1.79	1.43	0.08
Singapore	0.00	0.00	2.63	0.00	-0.02	0.00	0.00	0.66
Slovak Republic	0.08	0.09	2.63	0.00	0.00	0.04	0.03	-0.09
Slovenia	0.02	0.02	2.63	0.00	-0.02	0.01	0.01	0.46
South Africa	2.07	1.33	2.63	-0.05	-0.02	0.98	0.78	0.68
Spain	27.03	20.58	2.63	-0.43	-0.02	2.63	10.26	0.26
Sri Lanka	2.18	1.46	2.63	-0.05	-0.02	1.04	0.83	0.63

Sweden	0.17	0.10	2.63	0.00	-0.03	0.08	0.06	0.83
Switzerland	0.02	0.01	2.63	0.00	-0.02	0.01	0.01	0.45
Tajikistan	7.76	6.79	2.63	-0.06	-0.01	2.63	2.95	0.19
Tanzania	0.33	0.24	2.63	-0.01	-0.02	0.14	0.12	0.46
Thailand	0.94	0.73	2.63	-0.01	-0.01	0.44	0.36	0.42
Togo	0.09	0.07	2.63	0.00	-0.01	0.04	0.03	0.39
Tunisia	9.02	8.20	2.63	-0.05	-0.01	2.63	3.42	0.13
Turkey	8.00	6.95	2.63	-0.07	-0.01	2.63	3.04	0.20
Uganda	4.11	3.22	2.63	-0.06	-0.01	1.95	1.56	0.41
Ukraine	1.21	1.11	2.63	-0.01	-0.01	0.57	0.46	0.15
United Kingdom	0.09	0.06	2.63	0.00	-0.02	0.04	0.03	0.52
United States	7.07	5.74	2.63	-0.09	-0.01	2.63	2.68	0.30
Uruguay	0.13	0.14	2.63	0.00	0.01	0.06	0.05	-0.15
Venezuela, RB	0.11	0.10	2.63	0.00	-0.01	0.05	0.04	0.19
Vietnam	0.61	0.46	2.63	-0.01	-0.02	0.29	0.23	0.47
Yemen, Rep.	6.09	3.88	2.63	-0.15	-0.02	2.63	2.31	0.64
Zambia	0.09	0.03	2.63	0.00	-0.04	0.04	0.03	1.17
Zimbabwe	0.34	0.16	2.63	-0.01	-0.04	0.16	0.13	1.00

Source: Authors' calculations.

Land-use related biodiversity loss Consumption based (global fraction of potentially disappeared species, global PDF/1000 capita/year)

Country	Current sustainability			Progress of sustainability				
	2000-2004 average value of greenhouse gas emissions = y^0	2015-2019 average value of greenhouse gas emissions = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{x}$	progress on Land-use related biodiversity loss Consumption based
Albania	0.0000000096	0.0000000045	0.0000000333	-0.0000000003	-0.036	0.000000006	0.29	1.27
Algeria	0.0000000054	0.0000000044	0.0000000333	-0.0000000001	-0.012	0.000000003	0.16	0.44
Angola	0.0000000177	0.0000000121	0.0000000333	-0.0000000004	-0.021	0.000000008	0.53	0.58
Argentina	0.0000000173	0.0000000158	0.0000000333	-0.0000000001	-0.006	0.000000010	0.52	0.21
Armenia	0.0000000052	0.0000000074	0.0000000333	0.0000000002	0.029	0.000000003	0.15	-1.04
Australia	0.0000001570	0.0000000734	0.0000000333	-0.0000000056	-0.035	0.000000033	4.71	0.68
Austria	0.0000000308	0.0000000224	0.0000000333	-0.0000000006	-0.018	0.000000018	0.93	0.65
Azerbaijan	0.0000000053	0.0000000082	0.0000000333	0.0000000002	0.037	0.000000003	0.16	-1.32
Bangladesh	0.0000000019	0.0000000011	0.0000000333	-0.0000000001	-0.028	0.000000001	0.06	0.77
Belarus	0.0000000002	0.0000000001	0.0000000333	0.0000000000	-0.037	0.000000000	0.01	1.32
Belgium	0.0000000404	0.0000000312	0.0000000333	-0.0000000006	-0.015	0.000000023	1.21	0.54
Benin	0.0000000030	0.0000000023	0.0000000333	0.0000000000	-0.016	0.000000001	0.09	0.44
Bolivia	0.0000000511	0.0000000374	0.0000000333	-0.0000000009	-0.018	0.000000030	1.53	0.64
Botswana	0.0000000569	0.0000000535	0.0000000333	-0.0000000002	-0.004	0.000000033	1.71	0.14
Brazil	0.0000000749	0.0000000514	0.0000000333	-0.0000000016	-0.021	0.000000033	2.25	0.56
Bulgaria	0.0000000101	0.0000000091	0.0000000333	-0.0000000001	-0.006	0.000000006	0.30	0.23
Burkina Faso	0.0000000027	0.0000000034	0.0000000333	0.0000000001	0.019	0.000000001	0.08	-0.65
Cambodia	0.0000000049	0.0000000040	0.0000000333	-0.0000000001	-0.012	0.000000003	0.15	0.44
Cameroon	0.0000000106	0.0000000061	0.0000000333	-0.0000000003	-0.028	0.000000005	0.32	0.76
Canada	0.0000000219	0.0000000193	0.0000000333	-0.0000000002	-0.008	0.000000013	0.66	0.28
Chile	0.0000000097	0.0000000115	0.0000000333	0.0000000001	0.013	0.000000006	0.29	-0.45
China	0.0000000067	0.0000000082	0.0000000333	0.0000000001	0.015	0.000000004	0.20	-0.55
Colombia	0.0000001270	0.0000001080	0.0000000333	-0.0000000012	-0.010	0.000000033	3.81	0.20
Costa Rica	0.0000000291	0.0000000273	0.0000000333	-0.0000000001	-0.004	0.000000017	0.88	0.15
Cote d'Ivoire	0.0000000061	0.0000000028	0.0000000333	-0.0000000002	-0.037	0.000000003	0.18	1.00
Croatia	0.0000000228	0.0000000152	0.0000000333	-0.0000000005	-0.022	0.000000013	0.68	0.79
Cyprus	0.0000000186	0.0000000113	0.0000000333	-0.0000000005	-0.026	0.000000011	0.56	0.93
Czech Republic	0.0000000093	0.0000000087	0.0000000333	0.0000000000	-0.004	0.000000005	0.28	0.15
Denmark	0.0000000220	0.0000000137	0.0000000333	-0.0000000006	-0.025	0.000000013	0.66	0.90
Dominican Republic	0.0000000469	0.0000000380	0.0000000333	-0.0000000006	-0.013	0.000000027	1.41	0.45
Ecuador	0.0000000475	0.0000000382	0.0000000333	-0.0000000006	-0.013	0.000000028	1.43	0.47
Egypt, Arab Rep.	0.0000000019	0.0000000022	0.0000000333	0.0000000000	0.011	0.000000001	0.06	-0.41
El Salvador	0.0000000199	0.0000000170	0.0000000333	-0.0000000002	-0.010	0.000000012	0.60	0.35
Estonia	0.0000000141	0.0000000132	0.0000000333	-0.0000000001	-0.004	0.000000008	0.42	0.16
Ethiopia	0.0000000002	0.0000000002	0.0000000333	0.0000000000	-0.006	0.000000000	0.01	0.19
Finland	0.0000000244	0.0000000183	0.0000000333	-0.0000000004	-0.017	0.000000014	0.73	0.60
France	0.0000000286	0.0000000201	0.0000000333	-0.0000000006	-0.020	0.000000017	0.86	0.71
Gambia, The	0.0000000061	0.0000000034	0.0000000333	-0.0000000002	-0.029	0.000000003	0.18	0.98
Georgia	0.0000000120	0.0000000121	0.0000000333	0.0000000000	0.000	0.000000007	0.36	-0.01
Germany	0.0000000224	0.0000000174	0.0000000333	-0.0000000003	-0.015	0.000000013	0.67	0.52

Ghana	0.0000000047	0.0000000031	0.0000000333	-0.0000000001	-0.023	0.0000000002	0.14	0.63
Greece	0.0000000391	0.0000000256	0.0000000333	-0.0000000009	-0.023	0.0000000023	1.18	0.82
Guatemala	0.0000000123	0.0000000104	0.0000000333	-0.0000000001	-0.010	0.0000000007	0.37	0.36
Honduras	0.0000000212	0.0000000201	0.0000000333	-0.0000000001	-0.003	0.0000000012	0.64	0.12
Hungary	0.0000000090	0.0000000062	0.0000000333	-0.0000000002	-0.021	0.0000000005	0.27	0.73
India	0.0000000078	0.0000000066	0.0000000333	-0.0000000001	-0.010	0.0000000004	0.23	0.37
Indonesia	0.0000000394	0.0000000623	0.0000000333	0.0000000015	0.039	0.0000000023	1.18	-1.39
Ireland	0.0000000237	0.0000000161	0.0000000333	-0.0000000005	-0.022	0.0000000014	0.71	0.77
Israel	0.0000000303	0.0000000207	0.0000000333	-0.0000000006	-0.021	0.0000000018	0.91	0.75
Italy	0.0000000321	0.0000000213	0.0000000333	-0.0000000007	-0.022	0.0000000019	0.96	0.80
Jamaica	0.0000000299	0.0000000293	0.0000000333	0.0000000000	-0.001	0.0000000017	0.90	0.04
Japan	0.0000000359	0.0000000221	0.0000000333	-0.0000000009	-0.026	0.0000000021	1.08	0.91
Jordan	0.0000000088	0.0000000060	0.0000000333	-0.0000000002	-0.021	0.0000000005	0.27	0.76
Kazakhstan	0.0000000359	0.0000000364	0.0000000333	0.0000000000	0.001	0.0000000021	1.08	-0.04
Kenya	0.0000000098	0.0000000073	0.0000000333	-0.0000000002	-0.017	0.0000000004	0.29	0.45
Korea, Rep.	0.0000000246	0.0000000173	0.0000000333	-0.0000000005	-0.020	0.0000000014	0.74	0.71
Kyrgyz Republic	0.0000000119	0.0000000102	0.0000000333	-0.0000000001	-0.009	0.0000000007	0.36	0.34
Latvia	0.0000000073	0.0000000093	0.0000000333	0.0000000001	0.018	0.0000000004	0.22	-0.64
Lithuania	0.0000000076	0.0000000086	0.0000000333	0.0000000001	0.009	0.0000000004	0.23	-0.32
Luxembourg	0.0000000739	0.0000000990	0.0000000333	0.0000000017	0.023	0.0000000033	2.22	-0.62
Malawi	0.0000000028	0.0000000017	0.0000000333	-0.0000000001	-0.027	0.0000000001	0.08	0.73
Malaysia	0.0000000305	0.0000000255	0.0000000333	-0.0000000003	-0.011	0.0000000018	0.92	0.39
Mali	0.0000000031	0.0000000022	0.0000000333	-0.0000000001	-0.019	0.0000000001	0.09	0.52
Mexico	0.0000000699	0.0000000521	0.0000000333	-0.0000000012	-0.017	0.0000000033	2.10	0.49
Moldova	0.0000000006	0.0000000004	0.0000000333	0.0000000000	-0.021	0.0000000000	0.02	0.74
Mongolia	0.0000000178	0.0000000129	0.0000000333	-0.0000000003	-0.018	0.0000000010	0.53	0.66
Morocco	0.0000000048	0.0000000041	0.0000000333	0.0000000000	-0.010	0.0000000003	0.14	0.36
Mozambique	0.0000000140	0.0000000076	0.0000000333	-0.0000000004	-0.030	0.0000000006	0.42	0.82
Namibia	0.0000001180	0.0000000790	0.0000000333	-0.0000000026	-0.022	0.0000000033	3.54	0.46
Nepal	0.0000000054	0.0000000041	0.0000000333	-0.0000000001	-0.017	0.0000000002	0.16	0.46
Netherlands	0.0000000483	0.0000000284	0.0000000333	-0.0000000013	-0.027	0.0000000028	1.45	0.98
New Zealand	0.0000000957	0.0000000557	0.0000000333	-0.0000000027	-0.028	0.0000000033	2.87	0.64
Nicaragua	0.0000000250	0.0000000186	0.0000000333	-0.0000000004	-0.017	0.0000000015	0.75	0.60
Norway	0.0000000393	0.0000000287	0.0000000333	-0.0000000007	-0.018	0.0000000023	1.18	0.64
Pakistan	0.0000000006	0.0000000005	0.0000000333	0.0000000000	-0.013	0.0000000000	0.02	0.36
Panama	0.0000000943	0.0000000890	0.0000000333	-0.0000000004	-0.004	0.0000000033	2.83	0.09
Paraguay	0.0000000367	0.0000000369	0.0000000333	0.0000000000	0.000	0.0000000021	1.10	-0.02
Peru	0.0000000362	0.0000000301	0.0000000333	-0.0000000004	-0.011	0.0000000021	1.09	0.40
Philippines	0.0000000300	0.0000000187	0.0000000333	-0.0000000008	-0.025	0.0000000017	0.90	0.90
Poland	0.0000000082	0.0000000074	0.0000000333	0.0000000000	-0.006	0.0000000005	0.25	0.21
Portugal	0.0000000396	0.0000000265	0.0000000333	-0.0000000009	-0.022	0.0000000023	1.19	0.79
Romania	0.0000000105	0.0000000104	0.0000000333	0.0000000000	-0.001	0.0000000006	0.31	0.02
Russian Federation	0.0000000067	0.0000000066	0.0000000333	0.0000000000	-0.001	0.0000000004	0.20	0.02
Senegal	0.0000000037	0.0000000023	0.0000000333	-0.0000000001	-0.025	0.0000000002	0.11	0.69
Singapore	0.0000000924	0.0000000679	0.0000000333	-0.0000000016	-0.018	0.0000000033	2.78	0.41
Slovak Republic	0.0000000130	0.0000000105	0.0000000333	-0.0000000002	-0.013	0.0000000008	0.39	0.45
Slovenia	0.0000000219	0.0000000148	0.0000000333	-0.0000000005	-0.022	0.0000000013	0.66	0.77
South Africa	0.0000000870	0.0000000515	0.0000000333	-0.0000000024	-0.027	0.0000000033	2.61	0.66
Spain	0.0000000410	0.0000000267	0.0000000333	-0.0000000010	-0.023	0.0000000024	1.23	0.83
Sri Lanka	0.0000000039	0.0000000035	0.0000000333	0.0000000000	-0.008	0.0000000002	0.12	0.28
Sweden	0.0000000192	0.0000000166	0.0000000333	-0.0000000002	-0.009	0.0000000011	0.58	0.32
Switzerland	0.0000000317	0.0000000242	0.0000000333	-0.0000000005	-0.016	0.0000000018	0.95	0.56
Tajikistan	0.0000000014	0.0000000025	0.0000000333	0.0000000001	0.047	0.0000000001	0.04	-1.68

Tanzania	0.0000000096	0.0000000037	0.0000000333	-0.0000000004	-0.041	0.0000000005	0.29	1.38
Thailand	0.0000000084	0.0000000068	0.0000000333	-0.0000000001	-0.013	0.0000000005	0.25	0.47
Togo	0.0000000034	0.0000000024	0.0000000333	-0.0000000001	-0.021	0.0000000002	0.10	0.57
Tunisia	0.0000000098	0.0000000070	0.0000000333	-0.0000000002	-0.019	0.0000000006	0.29	0.69
Turkey	0.0000000230	0.0000000158	0.0000000333	-0.0000000005	-0.021	0.0000000013	0.69	0.75
Uganda	0.0000000052	0.0000000034	0.0000000333	-0.0000000001	-0.023	0.0000000002	0.16	0.63
Ukraine	0.0000000033	0.0000000023	0.0000000333	-0.0000000001	-0.020	0.0000000002	0.10	0.70
United Kingdom	0.0000000262	0.0000000143	0.0000000333	-0.0000000008	-0.030	0.0000000015	0.79	1.07
United States	0.0000000367	0.0000000266	0.0000000333	-0.0000000007	-0.018	0.0000000021	1.10	0.65
Uruguay	0.0000000267	0.0000000297	0.0000000333	0.0000000002	0.008	0.0000000015	0.80	-0.27
Venezuela, RB	0.0000000272	0.0000000223	0.0000000333	-0.0000000003	-0.012	0.0000000016	0.82	0.42
Vietnam	0.0000000070	0.0000000049	0.0000000333	-0.0000000001	-0.020	0.0000000004	0.21	0.70
Yemen, Rep.	0.0000000035	0.0000000023	0.0000000333	-0.0000000001	-0.023	0.0000000002	0.11	0.62
Zambia	0.0000000091	0.0000000062	0.0000000333	-0.0000000002	-0.021	0.0000000004	0.27	0.58
Zimbabwe	0.0000000043	0.0000000013	0.0000000333	-0.0000000002	-0.046	0.0000000002	0.13	1.25

Source: Authors' calculations.

Land-use related biodiversity loss Production based (global fraction of potentially disappeared species, global PDF/1000 capita/year)

Country	Current sustainability			Progress of sustainability				
	2000-2004 average value of greenhouse gas emissions = y^0	2015-2019 average value of greenhouse gas emissions = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	progress on Land-use related biodiversity
Albania	0.000000015	0.000000009	0.000000035	0.000000000	-0.025	0.000000008	0.42	0.80
Algeria	0.000000001	0.000000001	0.000000035	0.000000000	-0.021	0.000000001	0.04	0.66
Angola	0.000000017	0.000000009	0.000000035	-0.000000001	-0.031	0.000000009	0.48	0.98
Argentina	0.000000025	0.000000024	0.000000035	0.000000000	-0.001	0.000000013	0.72	0.03
Armenia	0.000000012	0.000000011	0.000000035	0.000000000	-0.003	0.000000006	0.34	0.10
Australia	0.000000231	0.000000164	0.000000035	-0.000000004	-0.019	0.000000035	6.67	0.34
Austria	0.000000016	0.000000015	0.000000035	0.000000000	-0.005	0.000000008	0.46	0.14
Azerbaijan	0.000000012	0.000000010	0.000000035	0.000000000	-0.010	0.000000006	0.35	0.32
Bangladesh	0.000000003	0.000000001	0.000000035	0.000000000	-0.032	0.000000001	0.07	1.00
Belarus	0.000000002	0.000000002	0.000000035	0.000000000	-0.017	0.000000001	0.07	0.54
Belgium	0.000000002	0.000000001	0.000000035	0.000000000	-0.018	0.000000001	0.05	0.56
Benin	0.000000002	0.000000001	0.000000035	0.000000000	-0.028	0.000000001	0.06	0.88
Bolivia	0.000000071	0.000000050	0.000000035	-0.000000001	-0.020	0.000000035	2.06	0.57
Botswana	0.000000055	0.000000036	0.000000035	-0.000000001	-0.022	0.000000029	1.58	0.71
Brazil	0.000000090	0.000000066	0.000000035	-0.000000002	-0.017	0.000000035	2.60	0.43
Bulgaria	0.000000011	0.000000009	0.000000035	0.000000000	-0.009	0.000000006	0.31	0.29
Burkina Faso	0.000000002	0.000000001	0.000000035	0.000000000	-0.023	0.000000001	0.06	0.56
Cambodia	0.000000015	0.000000010	0.000000035	0.000000000	-0.023	0.000000008	0.44	0.73
Cameroon	0.000000024	0.000000016	0.000000035	-0.000000001	-0.023	0.000000013	0.69	0.74
Canada	0.000000009	0.000000009	0.000000035	0.000000000	-0.002	0.000000005	0.26	0.08
Chile	0.000000013	0.000000010	0.000000035	0.000000000	-0.013	0.000000007	0.36	0.40
China	0.000000006	0.000000005	0.000000035	0.000000000	-0.003	0.000000003	0.16	0.09
Colombia	0.000000138	0.000000125	0.000000035	-0.000000001	-0.007	0.000000035	3.99	0.13
Costa Rica	0.000000091	0.000000066	0.000000035	-0.000000002	-0.019	0.000000035	2.63	0.45
Cote d'Ivoire	0.000000018	0.000000013	0.000000035	0.000000000	-0.020	0.000000009	0.51	0.62
Croatia	0.000000020	0.000000014	0.000000035	0.000000000	-0.019	0.000000011	0.58	0.60
Cyprus	0.000000005	0.000000004	0.000000035	0.000000000	-0.022	0.000000003	0.16	0.70
Czech Republic	0.000000003	0.000000003	0.000000035	0.000000000	0.005	0.000000002	0.09	-0.16
Denmark	0.000000003	0.000000003	0.000000035	0.000000000	0.000	0.000000001	0.07	0.00
Dominican Republic	0.000000054	0.000000039	0.000000035	-0.000000001	-0.019	0.000000028	1.56	0.59
Ecuador	0.000000077	0.000000067	0.000000035	-0.000000001	-0.009	0.000000035	2.23	0.24
Egypt, Arab Rep.	0.000000000	0.000000000	0.000000035	0.000000000	-0.031	0.000000000	0.00	0.97
El Salvador	0.000000018	0.000000017	0.000000035	0.000000000	-0.003	0.000000009	0.51	0.11
Estonia	0.000000006	0.000000009	0.000000035	0.000000000	0.042	0.000000003	0.16	-1.32
Ethiopia	0.000000007	0.000000004	0.000000035	0.000000000	-0.026	0.000000003	0.21	0.63
Finland	0.000000006	0.000000006	0.000000035	0.000000000	0.002	0.000000003	0.17	-0.07
France	0.000000008	0.000000007	0.000000035	0.000000000	-0.009	0.000000004	0.23	0.30
Gambia, The	0.000000002	0.000000002	0.000000035	0.000000000	-0.018	0.000000001	0.06	0.44
Georgia	0.000000021	0.000000015	0.000000035	0.000000000	-0.019	0.000000011	0.60	0.62
Germany	0.000000002	0.000000003	0.000000035	0.000000000	0.011	0.000000001	0.06	-0.34
Ghana	0.000000008	0.000000006	0.000000035	0.000000000	-0.023	0.000000004	0.24	0.71

Greece	0.000000028	0.000000032	0.000000035	0.000000000	0.009	0.000000015	0.82	-0.27
Guatemala	0.000000035	0.000000029	0.000000035	0.000000000	-0.011	0.000000018	1.01	0.35
Honduras	0.000000066	0.000000044	0.000000035	-0.000000001	-0.022	0.000000035	1.89	0.69
Hungary	0.000000005	0.000000004	0.000000035	0.000000000	-0.002	0.000000002	0.13	0.08
India	0.000000008	0.000000006	0.000000035	0.000000000	-0.012	0.000000004	0.22	0.37
Indonesia	0.000000073	0.000000071	0.000000035	0.000000000	-0.002	0.000000035	2.11	0.05
Ireland	0.000000002	0.000000003	0.000000035	0.000000000	0.012	0.000000001	0.07	-0.38
Israel	0.000000002	0.000000001	0.000000035	0.000000000	-0.036	0.000000001	0.04	1.15
Italy	0.000000015	0.000000013	0.000000035	0.000000000	-0.009	0.000000008	0.44	0.28
Jamaica	0.000000061	0.000000053	0.000000035	-0.000000001	-0.008	0.000000032	1.75	0.27
Japan	0.000000008	0.000000008	0.000000035	0.000000000	0.004	0.000000004	0.23	-0.13
Jordan	0.000000001	0.000000000	0.000000035	0.000000000	-0.043	0.000000000	0.02	1.37
Kazakhstan	0.000000045	0.000000040	0.000000035	0.000000000	-0.008	0.000000024	1.30	0.26
Kenya	0.000000007	0.000000006	0.000000035	0.000000000	-0.014	0.000000004	0.21	0.45
Korea, Rep.	0.000000002	0.000000002	0.000000035	0.000000000	-0.002	0.000000001	0.06	0.06
Kyrgyz Republic	0.000000018	0.000000012	0.000000035	0.000000000	-0.023	0.000000009	0.52	0.74
Latvia	0.000000006	0.000000008	0.000000035	0.000000000	0.030	0.000000003	0.16	-0.95
Lithuania	0.000000005	0.000000005	0.000000035	0.000000000	0.001	0.000000002	0.13	-0.02
Luxembourg	0.000000003	0.000000002	0.000000035	0.000000000	-0.012	0.000000002	0.09	0.37
Malawi	0.000000004	0.000000003	0.000000035	0.000000000	-0.023	0.000000002	0.12	0.71
Malaysia	0.000000033	0.000000030	0.000000035	0.000000000	-0.007	0.000000017	0.96	0.23
Mali	0.000000003	0.000000002	0.000000035	0.000000000	-0.029	0.000000002	0.09	0.92
Mexico	0.000000075	0.000000068	0.000000035	0.000000000	-0.006	0.000000035	2.16	0.16
Moldova	0.000000005	0.000000003	0.000000035	0.000000000	-0.022	0.000000002	0.13	0.70
Mongolia	0.000000086	0.000000051	0.000000035	-0.000000002	-0.027	0.000000035	2.49	0.68
Morocco	0.000000005	0.000000003	0.000000035	0.000000000	-0.019	0.000000003	0.14	0.61
Mozambique	0.000000021	0.000000012	0.000000035	-0.000000001	-0.028	0.000000011	0.60	0.88
Namibia	0.000000206	0.000000134	0.000000035	-0.000000005	-0.023	0.000000035	5.94	0.42
Nepal	0.000000011	0.000000008	0.000000035	0.000000000	-0.022	0.000000006	0.33	0.68
Netherlands	0.000000001	0.000000001	0.000000035	0.000000000	0.033	0.000000000	0.02	-1.04
New Zealand	0.000000282	0.000000147	0.000000035	-0.000000009	-0.032	0.000000035	8.15	0.55
Nicaragua	0.000000061	0.000000044	0.000000035	-0.000000001	-0.018	0.000000032	1.77	0.58
Norway	0.000000002	0.000000001	0.000000035	0.000000000	-0.007	0.000000001	0.05	0.23
Pakistan	0.000000001	0.000000001	0.000000035	0.000000000	-0.029	0.000000000	0.03	0.91
Panama	0.000000193	0.000000142	0.000000035	-0.000000003	-0.017	0.000000035	5.56	0.32
Paraguay	0.000000045	0.000000041	0.000000035	0.000000000	-0.007	0.000000024	1.31	0.21
Peru	0.000000045	0.000000038	0.000000035	-0.000000001	-0.011	0.000000024	1.31	0.36
Philippines	0.000000045	0.000000029	0.000000035	-0.000000001	-0.023	0.000000024	1.30	0.74
Poland	0.000000004	0.000000003	0.000000035	0.000000000	-0.016	0.000000002	0.13	0.51
Portugal	0.000000021	0.000000018	0.000000035	0.000000000	-0.009	0.000000011	0.61	0.28
Romania	0.000000012	0.000000012	0.000000035	0.000000000	-0.002	0.000000005	0.34	0.05
Russian Federation	0.000000006	0.000000005	0.000000035	0.000000000	-0.014	0.000000003	0.18	0.45
Senegal	0.000000002	0.000000001	0.000000035	0.000000000	-0.023	0.000000001	0.06	0.73
Singapore	0.000000000	0.000000000	0.000000035	0.000000000	-0.032	0.000000000	0.01	1.00
Slovak Republic	0.000000011	0.000000011	0.000000035	0.000000000	-0.002	0.000000006	0.32	0.07
Slovenia	0.000000012	0.000000012	0.000000035	0.000000000	-0.003	0.000000006	0.36	0.10
South Africa	0.000000096	0.000000068	0.000000035	-0.000000002	-0.019	0.000000035	2.76	0.46
Spain	0.000000031	0.000000029	0.000000035	0.000000000	-0.006	0.000000016	0.90	0.18
Sri Lanka	0.000000027	0.000000020	0.000000035	0.000000000	-0.016	0.000000014	0.78	0.51
Sweden	0.000000005	0.000000004	0.000000035	0.000000000	-0.009	0.000000003	0.15	0.29
Switzerland	0.000000007	0.000000006	0.000000035	0.000000000	-0.005	0.000000004	0.19	0.14
Tajikistan	0.000000006	0.000000004	0.000000035	0.000000000	-0.026	0.000000003	0.17	0.83
Tanzania	0.000000014	0.000000009	0.000000035	0.000000000	-0.024	0.000000006	0.41	0.58

Thailand	0.000000015	0.000000011	0.000000035	0.000000000	-0.018	0.000000008	0.43	0.58
Togo	0.000000003	0.000000002	0.000000035	0.000000000	-0.023	0.000000002	0.09	0.74
Tunisia	0.000000005	0.000000003	0.000000035	0.000000000	-0.024	0.000000003	0.16	0.75
Turkey	0.000000023	0.000000015	0.000000035	-0.000000001	-0.023	0.000000012	0.67	0.74
Uganda	0.000000008	0.000000005	0.000000035	0.000000000	-0.027	0.000000004	0.24	0.85
Ukraine	0.000000005	0.000000004	0.000000035	0.000000000	-0.011	0.000000003	0.15	0.33
United Kingdom	0.000000001	0.000000001	0.000000035	0.000000000	0.018	0.000000000	0.02	-0.57
United States	0.000000015	0.000000013	0.000000035	0.000000000	-0.010	0.000000008	0.43	0.33
Uruguay	0.000000028	0.000000032	0.000000035	0.000000000	0.012	0.000000015	0.79	-0.37
Venezuela, RB	0.000000026	0.000000017	0.000000035	-0.000000001	-0.022	0.000000014	0.75	0.69
Vietnam	0.000000011	0.000000006	0.000000035	0.000000000	-0.027	0.000000006	0.31	0.86
Yemen, Rep.	0.000000004	0.000000002	0.000000035	0.000000000	-0.037	0.000000002	0.11	1.18
Zambia	0.000000011	0.000000007	0.000000035	0.000000000	-0.027	0.000000006	0.32	0.85
Zimbabwe	0.000000008	0.000000006	0.000000035	0.000000000	-0.021	0.000000004	0.24	0.65

Source: Authors' calculations.

C. GEP Index

Country	material footprint	air pollution	protected areas	energy use	green trade	environmental patents	renewable energy	Palma ratio	gender inequality	access to basic services	mean years of schooling	pension coverage	life expectancy	GEP Index
Albania	0.12	0.19	0.24	0.05	0.10		0.01	0.05	0.05	0.08	0.04	0.01	0.07	0.01
	-1.86	0.28	0.23	0.83	-0.16		0.03	0.07	0.53	0.48	0.24	-1.09	0.39	
Algeria	0.05	0.25	0.18	0.04	0.15				0.07	0.15	0.05	0.01	0.06	0.22
	-4.47	-0.03	0.08	-0.31	0.65				0.49	1.74	0.50	0.27	0.39	
Angola	0.03	0.30	0.12	0.05			0.01	0.10		0.14	0.09	0.06	0.11	0.16
	-2.59	0.15	0.00	0.72			-0.72	0.16		0.30	0.17	0.26	0.77	
Argentina	0.14	0.12	0.32	0.04	0.02	0.08	0.03	0.07	0.04	0.03	0.04	0.01	0.06	0.16
	-0.51	0.43	0.03	0.37	-0.13	0.25	-0.05	1.04	0.16	0.99	0.28	0.64	0.23	
Australia	0.53	0.08	0.06	0.06	0.02	0.06	0.05		0.02	0.04	0.03	0.01	0.05	0.07
	-0.20	1.00	0.10	0.53	-0.10	0.08	0.06		0.50	0.29	0.36	-0.47	0.64	
Austria	0.48	0.16	0.08	0.05	0.01	0.04	0.02		0.03		0.05	0.01	0.08	0.14
	-0.10	0.46	0.00	0.31	0.06	-0.20	0.15		0.68		0.70	1.00	0.54	
Azerbaijan	0.04	0.18	0.19	0.14	0.09		0.16		0.04	0.04	0.03	0.00	0.07	-0.11
	-9.67	0.18	0.04	1.45	0.01		-0.04		0.05	0.46	-0.03	-5.30	0.44	
Bangladesh	0.02	0.35	0.24	0.03	0.06		0.01	0.03	0.06	0.05	0.06	0.05	0.05	0.12
	-1.04	0.01	0.01	0.27	-0.12		-0.44	0.17	0.33	0.40	0.43	0.74	0.48	
Belarus		0.23	0.24	0.17	0.02		0.09	0.05		0.05	0.05	0.02	0.09	0.38
		0.27	0.07	0.98	-0.02		0.17	0.36		0.14	0.68	1.00	0.45	
Belgium	0.28	0.12	0.05	0.06	0.01	0.03	0.23	0.05	0.02	0.03	0.04		0.06	0.62
	-0.07	0.45	0.22	0.74	0.03	1.00	1.63	0.40	0.89	0.77	0.40		0.55	
Benin	0.04	0.30	0.05	0.06			0.01	0.06	0.08	0.13	0.13	0.07	0.08	-0.03
	-1.49	0.02	0.02	-0.58			-0.39	-1.31	0.14	0.27	0.41	0.23	0.26	
Bolivia	0.09	0.25	0.09	0.06	0.03		0.02	0.14	0.09	0.09	0.06	0.01	0.09	0.15
	-2.46	0.27	0.05	-0.13	-0.12		-0.25	1.13	0.36	0.29	0.44	1.00	0.65	
Brazil	0.21	0.14	0.08	0.05	0.01	0.07	0.01	0.13	0.07	0.06	0.07	0.01	0.08	0.05
	-1.01	0.48	0.19	0.02	-0.06	0.16	0.00	0.44	0.33	0.31	0.56	-0.36	0.37	
Bulgaria	0.10	0.19	0.32	0.10	0.02	0.04	0.05		0.04	0.04	0.04	0.00	0.07	0.52
	-5.14	0.31	2.44	1.00	0.16	-0.52	0.77		0.50	0.27	0.46	1.00	0.23	
Cambodia	0.01	0.12	0.03	0.04	0.30		0.00		0.04	0.09	0.06	0.25	0.04	0.50
	-6.45	0.21	0.06	0.76	0.55		-0.83		0.37	1.50	0.80	0.50	0.44	
Cameroon	0.02	0.38	0.12	0.05	0.13		0.00	0.04	0.06	0.05	0.05	0.03	0.06	0.15
	-0.70	-0.06	0.20	0.79	0.46		-0.58	-0.22	0.27	0.29	0.26	0.09	0.39	
Canada	0.39	0.06	0.20	0.09	0.01	0.05	0.02	0.05	0.02	0.03	0.03	0.00	0.05	0.13
	-0.21	1.02	0.09	0.73	0.02	0.12	0.01	0.12	0.59	0.23	0.71	0.53	0.54	
Chile	0.29	0.20	0.14	0.05	0.02		0.01	0.09	0.05	0.04	0.04	0.01	0.06	0.19
	-0.11	0.29	0.02	0.51	-0.20		-0.10	0.74	0.40	0.57	0.23	-0.27	0.42	
China	0.10	0.31	0.26	0.08	0.01	0.03	0.01	0.04	0.02	0.03	0.04	0.01	0.04	-0.08
	-2.58	0.12	0.04	0.52	0.21	0.38	-0.38	0.28	0.59	0.57	0.34	1.00	0.36	
Colombia	0.10	0.17	0.12	0.04	0.04	0.09	0.02	0.12	0.07	0.06	0.06	0.04	0.07	0.23
	-1.36	0.32	0.10	0.57	-0.06	1.00	-0.13	0.69	0.32	0.09	0.51	0.85	0.32	
Costa Rica	0.13	0.22	0.08	0.04	0.03	0.06	0.02	0.12	0.07	0.05	0.07	0.02	0.09	0.05
	-1.18	0.35	0.03	0.06	0.01	-0.28	0.10	0.17	0.45	0.50	0.17	0.57	0.33	
Cote d'Ivoire	0.02	0.20	0.06	0.05	0.09		0.01	0.07	0.09	0.08	0.11	0.12	0.10	0.10
	1.00	-0.10	0.01	-1.15	0.10		-0.11	0.15	0.09	0.15	0.56	0.15	0.43	
Croatia	0.20	0.16	0.36	0.05	0.01	0.04	0.02		0.03	0.04	0.04		0.06	0.19
	0.04	0.28	0.16	0.47	0.11	0.06	0.10		0.53	0.02	0.39		0.35	
Cyprus	0.31	0.12	0.27	0.03	0.01		0.10	0.03	0.02	0.03	0.03	0.00	0.05	0.18
	0.02	0.24	0.01	0.55	-0.06		0.80	-0.45	0.91	0.12	0.48	0.73	0.41	
Czech Republic	0.31	0.17	0.09	0.08	0.01	0.05	0.07	0.05	0.03	0.04	0.04		0.07	0.25
	-0.19	0.37	0.16	0.95	0.10	0.51	0.46	0.24	0.50	0.60	0.55		0.42	
Denmark	0.50	0.12	0.06	0.04	0.01	0.05	0.04		0.01	0.04	0.04		0.08	0.37
	0.22	0.89	0.07	0.78	0.00	-0.02	0.65		0.71	0.39	0.30		0.56	
Dominican Republic	0.11	0.20	0.06	0.06	0.05		0.03	0.14	0.10	0.06	0.08		0.11	0.25
	-0.97	0.37	-0.04	0.93	0.54		-0.08	0.55	0.19	0.94	0.35		0.30	
Ecuador	0.12	0.17	0.03	0.05	0.08	0.09	0.03	0.12	0.08	0.06	0.06	0.04	0.08	0.09
	-1.56	0.40	0.01	0.29	-0.01	-0.52	-0.17	1.06	0.40	0.13	0.50	0.86	0.29	
Egypt, Arab Rep.	0.06	0.42	0.15	0.03	0.06	0.03	0.04	0.03	0.06	0.03	0.05		0.05	0.06

	-0.96	-0.23	0.32	-0.07	1.62	0.00	-0.18	0.01	0.48	0.17	0.78		0.22	
El Salvador	0.10	0.34		0.07	0.05		0.01	0.11	0.09	0.05	0.09		0.09	0.29
	-0.86	0.30		0.55	0.20		-0.50	0.78	0.38	0.78	0.46		0.28	
Estonia	0.36	0.09	0.07	0.11	0.02	0.10	0.03		0.05	0.05	0.04	0.01	0.09	0.20
	-0.90	0.90	0.05	0.70	0.14	2.46	0.15		0.88	0.11	0.53	1.00	0.56	
Finland	0.56	0.06	0.08	0.08	0.01	0.04	0.01	0.05	0.01		0.04		0.06	0.20
	0.03	0.87	0.04	0.54	0.08	0.67	0.19	-0.05	0.56		0.61		0.59	
France	0.41	0.15	0.07	0.06	0.01	0.05	0.06		0.03	0.04	0.05		0.08	0.32
	0.17	0.55	0.38	0.55	0.01	0.04	0.19		0.88	0.00	0.34		0.69	
Georgia	0.06	0.19	0.35	0.06	0.03	0.05	0.01	0.05	0.05	0.05	0.03	0.01	0.07	-0.14
	-4.44	0.16	0.00	0.73	0.05	0.17	-0.53	0.09	0.21	0.10	0.42	0.60	0.25	
Germany	0.41	0.16	0.03	0.06	0.01	0.06	0.12		0.02		0.04		0.08	0.31
	-0.05	0.54	0.19	0.64	0.06	0.00	0.79		0.60		1.05		0.45	
Ghana	0.03	0.24	0.24	0.05	0.07		0.01		0.07	0.09	0.05	0.08	0.07	0.10
	-1.73	-0.01	0.00	0.89	0.24		-0.76		0.15	0.37	0.15	0.38	0.30	
Greece	0.42	0.14	0.11	0.03	0.01	0.03	0.05	0.06	0.03	0.03	0.03	0.00	0.05	0.35
	0.45	0.32	0.13	0.20	-0.01	0.15	0.52	0.04	0.68	0.55	0.29	-1.51	0.52	
Guatemala	0.06	0.24	0.05	0.04	0.03	0.14	0.01	0.10	0.07	0.05	0.10	0.04	0.07	0.31
	-0.29	0.32	0.01	-0.30	0.12	-0.06	0.09	0.57	0.26	0.32	1.40	0.14	0.42	
Honduras	0.04	0.15	0.22	0.04	0.04	0.16	0.01	0.07	0.05	0.03	0.06	0.11	0.05	0.22
	-0.99	0.35	0.04	0.03	-0.03	0.22	0.02	0.53	0.17	0.71	0.86	0.24	0.29	
Hungary	0.23	0.15	0.20	0.06	0.01	0.07	0.08	0.04	0.04	0.04	0.03	0.00	0.07	0.45
	0.00	0.29	1.04	0.74	0.22	0.33	0.79	0.06	0.14	0.67	0.41	1.00	0.31	
India	0.03	0.36	0.20	0.04	0.01	0.02	0.00	0.03	0.17	0.03	0.04	0.04	0.04	0.20
	-2.27	-0.08	0.00	0.46	0.13	-0.07	-0.30	-0.13	1.05	0.78	0.76	0.82	0.52	
Indonesia	0.07	0.14	0.24	0.06	0.03	0.10	0.01	0.04	0.07	0.04	0.05	0.08	0.07	0.04
	-2.33	0.17	0.26	0.70	0.02	-0.09	-0.12	-0.66	0.31	0.84	0.26	0.22	0.42	
Ireland	0.09	0.02	0.06	0.01	0.01	0.01	0.05	0.02	0.69	0.01	0.01		0.02	0.89
	0.37	0.93	0.29	1.28	0.06	0.16	1.24	0.36	1.03	0.59	0.45		0.67	
Israel	0.31	0.21	0.10	0.05	0.01	0.09	0.07		0.03	0.04	0.03	0.01	0.07	0.23
	0.24	0.20	0.00	0.64	0.01	-0.13	-0.16		0.71	0.59	0.45	0.23	0.65	
Italy	0.30	0.16	0.18	0.03	0.01	0.07	0.07	0.07	0.02	0.04	0.04	0.01		0.32
	0.23	0.28	0.37	0.36	0.01	0.26	0.72	0.03	0.84	0.52	0.29	0.72		
Jamaica	0.18	0.16	0.24	0.09	0.01		0.04		0.08	0.05	0.06		0.08	0.28
	0.27	0.38	0.00	0.82	-0.17		0.29		0.22	0.79	0.51		0.01	
Japan	0.39	0.13	0.17	0.06	0.01	0.05	0.12		0.02		0.04	0.01		0.21
	0.10	0.52	0.02	0.67	0.04	-0.19	0.23		0.39		0.58	1.00		
Jordan	0.13	0.26	0.03	0.05	0.02	0.05	0.20	0.05	0.08	0.04	0.04	0.01	0.06	0.19
	0.29	0.00	0.00	0.49	-0.06	-0.41	0.39	0.34	0.40	0.17	0.18	0.04	0.18	
Kazakhstan	0.14	0.08	0.34	0.07	0.09		0.11	0.03	0.03	0.03	0.02		0.05	0.02
	-0.79	0.37	0.04	0.21	-0.01		-0.25	0.60	0.83	0.69	0.25		0.59	
Kenya	0.03	0.17	0.07	0.05			0.00		0.06	0.13	0.05	0.35	0.07	1.57
	-0.47	-0.01	0.00	0.32			-0.44		0.33	1.00	0.19	3.84	0.79	
Korea, Rep.	0.21	0.14	0.17	0.05	0.01		0.33		0.01	0.02	0.02		0.04	0.30
	0.09	0.18	0.05	0.45	0.39		0.45		1.00	0.86	0.42		0.78	
Kyrgyz Republic	0.12	0.25	0.22	0.08			0.01	0.05	0.08	0.05	0.04	0.01	0.08	0.02
	-1.07	0.21	-0.04	0.05			-0.19	0.15	0.50	0.39	0.23	1.00	0.23	
Latvia	0.20	0.18	0.14	0.08	0.02	0.04	0.02	0.07	0.05	0.05	0.05		0.09	-0.22
	-2.52	0.46	0.08	0.67	0.07	0.12	0.06	0.38	0.61	0.30	0.65		0.29	
Lithuania	0.29	0.14	0.12	0.09	0.02	0.02	0.03	0.07	0.04	0.05	0.04	0.01	0.08	0.01
	-1.14	0.54	0.22	1.23	0.27	-0.26	0.24	-0.09	0.75	0.62	0.63	1.00	0.26	
Luxembourg	0.60	0.08	0.03	0.03	0.01	0.02	0.12		0.02		0.03		0.05	0.10
	-0.26	0.78	0.10	0.87	0.14	-0.42	0.82		0.87		0.43		0.72	
Macedonia, FYR	0.13	0.18	0.25	0.08	0.06		0.05	0.06		0.06	0.06	0.01	0.08	0.12
	-1.50	0.25	0.07	0.45	3.89		0.30	-1.51		0.29	0.67	0.00	0.22	
Malawi	0.02	0.21	0.08		0.18		0.01	0.07	0.09		0.12	0.12	0.11	0.34
	-0.08	0.15	0.02		1.00		0.10	-0.82	0.17		0.47	-0.07	1.13	
Malaysia	0.22	0.13	0.22	0.06	0.01	0.05	0.06	0.06	0.04	0.03	0.04	0.03	0.06	0.06
	-0.38	0.21	0.01	0.21	0.37	0.14	-0.09	0.47	0.32	0.55	0.46	0.10	0.25	
Mali	0.02	0.16	0.27		0.07		0.00	0.03	0.05	0.16	0.13	0.06	0.05	0.20
	-1.64	0.01	0.24		0.00		-1.71	0.42	0.08	0.64	0.27	-0.05	0.52	
Mexico	0.15	0.21	0.11	0.04	0.01	0.06	0.04	0.09	0.06	0.06	0.05	0.05	0.06	0.31
	0.02	0.33	0.18	0.31	0.04	0.04	-0.11	0.51	0.47	0.24	0.44	1.94	0.01	
Moldova		0.25		0.15	0.03	0.04	0.12	0.08	0.08	0.07	0.06	0.01	0.11	0.57
		0.31		0.94	0.06	-0.05	1.13	0.73	0.70	0.51	0.46	-0.55	0.37	
Mongolia	0.03	0.20	0.06	0.07	0.41		0.04	0.03	0.04	0.04	0.03	0.00	0.05	-0.22

	-12.08	-0.04	0.01	0.42	0.15		-0.31	-0.13	0.51	0.20	0.41	1.00	0.51	
Morocco	0.07	0.30		0.05	0.06	0.04	0.03	0.07	0.10	0.07	0.12		0.08	0.01
	-3.03	-0.06		0.10	0.14	-0.02	-0.24	0.02	0.44	0.33	0.93		0.52	
Mozambique	0.02	0.14	0.20	0.21	0.06		0.00	0.06	0.06		0.11	0.06	0.07	0.15
	-0.74	0.09	0.05	0.46	-0.04		-1.06	-0.94	0.16		0.38	0.30	0.55	
Namibia	0.15	0.21	0.07	0.04	0.05		0.01	0.16	0.07	0.09	0.06	0.01	0.09	0.30
	0.18	0.09	0.50	0.29	-0.05		-0.13	0.52	0.22	0.32	0.35	0.87	0.68	
Nepal	0.02	0.50	0.06	0.06			0.00	0.05	0.06	0.08	0.10	0.01	0.05	0.20
	-2.05	-0.11	-0.02	0.45			-0.36	1.26	0.47	0.46	1.00	0.44	0.59	
Netherlands	0.36	0.13	0.03	0.06	0.01	0.04	0.24		0.01		0.04		0.07	0.42
	0.15	0.53	0.05	0.64	0.15	-0.02	0.78		0.81		0.36		0.58	
New Zealand	0.45	0.07	0.10	0.08	0.01	0.09	0.02		0.03	0.05	0.04		0.07	0.19
	0.00	0.80	0.04	0.39	-0.15	0.07	0.03		0.41	0.71	0.42		0.53	
Nicaragua	0.06	0.21	0.06	0.07	0.05		0.01	0.11	0.09	0.06	0.08	0.13	0.08	0.30
	-1.41	0.39	0.18	0.37	-0.21		-0.17	0.55	0.38	0.18	0.53	0.79	0.30	
Norway	0.40	0.05	0.29	0.04	0.01	0.04	0.01	0.04	0.01	0.03	0.02	0.00	0.05	0.10
	-0.25	1.00	0.21	0.19	0.18	0.13	-0.02	0.46	0.79	0.04	0.20	0.32	0.70	
Pakistan	0.03	0.31	0.17	0.04	0.06		0.01	0.03	0.06	0.04	0.06	0.15	0.05	0.12
	-0.66	0.04	0.10	0.40	0.70		-0.07	-0.33	0.34	-0.02	0.41	0.02	0.32	
Panama	0.13	0.14	0.17	0.03	0.05	0.10	0.01	0.12	0.08	0.05	0.05		0.08	0.23
	-0.34	0.59	0.06	0.78	0.26	-0.15	-0.27	0.59	0.13	0.88	0.30		0.31	
Paraguay	0.08	0.07	0.16	0.03	0.40		0.00	0.06	0.04	0.03	0.03	0.04	0.04	0.28
	-1.33	0.48	0.11	0.48	0.53		-0.21	0.63	0.22	0.28	0.55	0.56	0.23	
Peru	0.12	0.21	0.20	0.03	0.07	0.06	0.01	0.08	0.06	0.06	0.04	0.02	0.06	0.20
	-0.82	0.24	0.31	0.19	0.24	0.55	-0.18	0.88	0.40	0.31	0.21	0.04	0.35	
Philippines	0.02	0.05	0.08	0.01	0.01	0.01	0.00	0.02	0.73	0.02	0.01	0.01	0.02	0.79
	-0.57	0.29	0.00	0.96	0.95	-0.03	-0.12	0.25	1.01	0.22	0.33	0.31	0.17	
Poland	0.25	0.23	0.14	0.08	0.01	0.04	0.06		0.03	0.04	0.04	0.01	0.07	0.23
	-0.50	0.27	0.63	1.03	0.09	0.27	0.24		0.55	0.70	0.35	1.00	0.34	
Portugal	0.37	0.08	0.17	0.04	0.01	0.03	0.02	0.09	0.03	0.04	0.05	0.00	0.06	0.41
	0.37	0.94	0.02	0.39	0.17	0.20	0.13	0.80	0.85	0.63	0.57	-4.90	0.61	
Russian Federation	0.13	0.16	0.10	0.14	0.03	0.04	0.13	0.06	0.06	0.05	0.03	0.01	0.08	0.02
	-1.55	0.29	0.01	0.67	-0.02	-0.01	-0.04	-0.06	0.60	0.08	0.20	-0.10	0.59	
Senegal	0.04	0.30	0.07	0.05	0.03		0.01	0.06	0.07	0.11	0.15	0.04	0.08	0.14
	-0.43	0.00	0.03	-0.10	-0.11		-0.04	0.31	0.30	0.25	0.30	0.43	0.43	
Singapore	0.25	0.07	0.22	0.02	0.01	0.04	0.35		0.01		0.02		0.03	0.04
	-0.20	-0.02	0.00	1.13	0.17	0.10	0.04		1.06		0.44		0.80	
Slovak Republic	0.34	0.16	0.06	0.09	0.01	0.05	0.07	0.05	0.03	0.03	0.03	0.00	0.06	0.20
	-0.55	0.33	0.34	1.40	0.08	0.95	0.57	0.56	0.22	0.23	0.61	1.00	0.34	
Slovenia	0.32	0.16	0.16	0.06	0.01	0.03	0.03	0.05	0.03	0.04	0.03	0.01	0.07	0.59
	0.07	0.30	2.30	0.67	-0.01	-0.21	0.15	-0.08	1.01	0.56	0.21	1.00	0.62	
South Africa	0.13	0.19	0.19	0.11	0.01	0.05	0.02	0.10	0.05	0.04	0.04	0.01	0.08	0.07
	0.11	0.07	0.11	0.34	-0.08	-0.09	-0.04	-0.84	-0.02	0.44	0.38	0.40	0.48	
Spain	0.49	0.11	0.09	0.05	0.01	0.04	0.06		0.02		0.05	0.01	0.07	0.39
	0.32	0.83	0.03	0.58	-0.01	0.18	0.37		0.59		0.28	-0.37	0.83	
Sri Lanka	0.03	0.24	0.40	0.03			0.01	0.06	0.06	0.04	0.04	0.02	0.07	0.09
	-6.66	0.67	0.02	0.93			-0.25	0.05	0.26	0.89	0.20	0.07	0.33	
Sweden	0.47	0.08	0.15	0.09	0.01	0.06	0.01		0.01		0.04		0.08	0.25
	-0.03	0.97	0.05	0.75	0.02	0.74	0.26		0.54		0.30		0.60	
Switzerland	0.49	0.13	0.08	0.04	0.01	0.08	0.03	0.05	0.02	0.04	0.04			0.06
	-0.27	0.78	0.08	0.76	-0.11	-0.04	0.13	-0.13	0.83	0.45	0.74			
Tajikistan		0.30	0.24	0.08		0.17	0.00	0.03	0.04	0.04	0.03	0.00	0.06	0.20
		0.13	0.05	1.37		-0.09	-0.51	-0.05	0.33	0.16	0.01	0.40	0.62	
Thailand	0.13	0.25	0.14	0.06	0.02		0.02	0.07	0.05	0.04	0.06	0.10	0.07	0.27
	-1.26	0.21	0.03	-0.06	0.28		0.08	0.70	0.01	0.99	0.34	2.52	0.44	
Togo	0.03	0.25	0.10	0.14	0.08		0.00		0.07	0.13	0.08	0.05	0.08	0.26
	-0.99	0.02	0.50	-0.16	1.32		-0.29		0.27	0.54	0.22	0.39	0.37	
Tunisia	0.07	0.19	0.45	0.03	0.02	0.02	0.02	0.04	0.04	0.03	0.05	0.01	0.04	0.10
	-0.88	-0.07	0.08	0.29	0.77	0.04	-0.08	0.84	0.53	0.67	0.68	0.15	0.25	
Turkey	0.11	0.23	0.33	0.03	0.01	0.05	0.02	0.04	0.05	0.04	0.04	0.01	0.05	-0.11
	-2.06	-0.06	0.00	0.46	0.07	-0.12	-0.16	-0.13	0.78	0.62	0.68	1.00	0.48	
Uganda	0.02	0.24	0.10		0.09		0.00	0.05	0.05		0.06	0.31	0.07	0.44
	-0.15	-0.12	0.15		0.35		-0.86	0.45	0.26		0.45	1.00	0.86	
Ukraine	0.08	0.14	0.14	0.12	0.01	0.03	0.27	0.03	0.04	0.05	0.03	0.00	0.05	0.10
	-3.73	0.24	0.00	0.68	-0.18	-0.01	0.75	0.31	0.50	0.69	0.21	0.24	0.29	
United Kingdom	0.24	0.08	0.05	0.04	0.01	0.08	0.33	0.06	0.02		0.02	0.00	0.05	0.85

	0.29	0.78	0.07	1.00	0.03	0.04	1.85	-0.05	0.58		0.48	1.00	0.51	
United States	0.49	0.07	0.06	0.07	0.00	0.08	0.07		0.03	0.03	0.03	0.00	0.06	0.29
	0.25	1.07	0.02	0.72	-0.02	-0.04	0.26		0.42	0.36	0.50	-5.50	0.23	
Uruguay	0.46	0.12		0.04	0.06		0.01	0.09	0.07		0.06	0.01	0.08	-0.21
	-0.90	0.89		-0.13	-0.18		0.31	0.57	0.51		0.17	0.38	0.27	
Venezuela, RB	0.15	0.22	0.05	0.09	0.06		0.04	0.09	0.08	0.06	0.07		0.09	0.20
	-0.01	0.37	0.00	0.28	-0.14		-0.04	0.15	0.13	0.14	0.98		-0.01	
Vietnam	0.07	0.26	0.30	0.05	0.05		0.01	0.05	0.04	0.03	0.06	0.03	0.06	-0.34
	-8.12	0.21	0.05	0.04	0.71		-0.38	0.21	0.13	0.98	0.76	0.47	0.17	
Yemen, Rep.	0.01	0.21	0.23		0.06		0.20		0.05	0.03	0.13	0.03	0.04	0.17
	-0.22	-0.02	0.07		0.10		0.30		-0.04	0.40	0.50	0.02	0.40	
Zambia	0.04	0.18	0.03	0.10	0.15		0.00	0.06	0.06	0.13	0.04	0.12	0.08	0.35
	-0.78	0.15	0.03	0.76	0.81		-0.16	-0.91	0.24	0.42	0.17	0.31	1.12	
Zimbabwe	0.03	0.19	0.08	0.14	0.09		0.01		0.08	0.10	0.06	0.13	0.11	0.22
	2.55	0.09	0.22	-0.31	-0.02		0.27		0.20	0.07	0.26	0.10	0.97	

Source: Authors' calculations.

Note: Normalized weights top row, while progress bottom row. Empty space indicate missing values.

D. Ranking of GEP Index-dashboard profiles using the Protective Criterion (GEP+), 108 countries by HDI group⁴⁷

Rank	Country	Progress Greenhouse gas emissions	Progress Water stress	Progress Land Use related biodiversity loss	GEP Index	Worst performance (for Protective criterion)	HDI group
1	Portugal	1.1533	1.4616	0.5545	0.3960	0.3960	Very High
2	Spain	1.7580	2.2702	0.5920	0.3772	0.3772	Very High
3	Greece	2.2904	3.4458	0.3740	0.3943	0.3740	Very High
4	Italy	1.8726	0.9727	0.4454	0.3382	0.3382	Very High
5	United States	2.9235	0.8539	0.4329	0.3296	0.3296	Very High
6	Denmark	2.5865	0.3102	0.2978	0.3383	0.2978	Very High
7	Ireland	2.5327	0.3631	0.2608	3.3834	0.2608	Very High
8	Cyprus	1.0462	3.9137	0.3156	0.2498	0.2498	Very High
9	France	1.5036	0.2277	0.3388	0.2892	0.2277	Very High
10	Israel	1.2255	1.3788	0.3669	0.2220	0.2220	Very High
11	Netherlands	1.1585	0.2102	0.6987	0.4622	0.2102	Very High
12	United Kingdom	2.5563	0.1877	0.4167	1.1192	0.1877	Very High
13	Japan	0.2678	0.1511	0.4774	0.2300	0.1511	Very High
14	Norway	0.3872	0.0914	0.3833	0.1232	0.0914	Very High
15	Australia	2.1119	1.1093	2.7325	0.0877	0.0877	Very High
16	Austria	1.0641	0.0780	0.3355	0.1250	0.0780	Very High
17	Hungary	0.8762	0.0720	0.1039	0.4468	0.0720	Very High
18	Croatia	0.3303	0.0510	0.4457	0.2241	0.0510	Very High
19	Finland	2.5836	0.0047	0.2125	0.2329	0.0047	Very High
20	Switzerland	1.0003	-0.0065	0.2830	0.0515	-0.0065	Very High
21	Canada	0.6410	-0.0160	0.1010	0.1535	-0.0160	Very High
22	New Zealand	1.3284	-0.0289	3.1563	0.1850	-0.0289	Very High
23	Belgium	1.8846	-0.1238	0.3434	0.6567	-0.1238	Very High
24	Romania	0.2508	-0.1288	0.0107	-0.0270	-0.1288	Very High
25	Slovak Republic	0.6425	-0.1437	0.0999	0.1988	-0.1437	Very High
26	Sweden	1.3759	-0.1880	0.1151	0.2359	-0.1880	Very High
27	Czech Republic	1.1663	-0.2040	0.0132	0.2473	-0.2040	Very High
28	Poland	-0.2042	-0.1605	0.0589	0.2095	-0.2042	Very High
29	Germany	1.0785	-0.2189	0.1651	0.2837	-0.2189	Very High
30	Bulgaria	-0.2635	-0.1495	0.0795	0.5510	-0.2635	Very High
31	Belarus	-0.3564	-0.0768	0.0237	0.3787	-0.3564	Very High
32	Argentina	-0.3674	0.1233	0.0658	0.1755	-0.3674	Very High
33	Slovenia	0.8735	-0.4080	0.2716	0.5341	-0.4080	Very High
34	Estonia	-0.3492	-0.5013	-0.0741	0.1593	-0.5013	Very High
35	Luxembourg	2.9507	-0.3909	-0.6684	0.1526	-0.6684	Very High
36	Costa Rica	-0.8424	-0.0751	0.6595	0.0310	-0.8424	Very High
37	Lithuania	-0.8532	-0.6176	-0.0380	0.0052	-0.8532	Very High

⁴⁷ Values used for the GEP index and progress on dashboard indicators are calculated as indicated in Sections 3.2 and 3.4, respectively.

38	Panama	-1.1042	-0.0875	1.0048	0.2041	-1.1042	Very High
39	Latvia	-1.1504	-0.2543	-0.1485	-0.1703	-1.1504	Very High
40	Uruguay	-1.2115	-0.1352	-0.2556	-0.2042	-1.2115	Very High
41	Chile	-1.3452	0.0975	0.0075	0.2114	-1.3452	Very High
42	Russian Federation	-1.3556	-0.2524	0.0416	0.0173	-1.3556	Very High
43	Turkey	-1.4007	0.4216	0.5059	-0.1509	-1.4007	Very High
44	Korea, Rep.	-1.4033	0.1716	0.2636	0.6236	-1.4033	Very High
45	Malaysia	-1.5145	-0.1559	0.2889	0.0649	-1.5145	Very High
46	Singapore	-1.7895	-0.6220	0.5766	0.1035	-1.7895	Very High
47	Georgia	-2.4866	-0.0141	0.1832	-0.1377	-2.4866	Very High
48	Kazakhstan	-3.1065	0.2394	0.1496	0.0300	-3.1065	Very High
1	Botswana	0.3206	0.3137	0.6798	0.4566	0.3137	High
2	Jordan	0.6112	1.2313	0.1123	0.1905	0.1123	High
3	Ukraine	0.7869	0.0359	0.0590	0.1261	0.0359	High
4	South Africa	0.0112	0.4294	1.4927	0.0742	0.0112	High
5	Venezuela, RB	0.2126	-0.0319	0.4337	0.1772	-0.0319	High
6	Jamaica	1.0031	-0.0395	0.2538	0.2792	-0.0395	High
7	Mexico	-0.0601	0.3366	0.6874	0.3027	-0.0601	High
8	Philippines	-0.2276	0.0261	0.8831	2.7011	-0.2276	High
9	Tunisia	-0.3353	-0.0259	0.1593	0.1462	-0.3353	High
10	Dominican Republic	-0.5128	-0.4156	0.7764	0.1872	-0.5128	High
11	Colombia	-0.5886	-0.0864	0.6409	0.2029	-0.5886	High
12	Brazil	-0.6398	-0.0422	1.1889	0.0423	-0.6398	High
13	Ecuador	-0.6431	0.0438	0.6040	0.0746	-0.6431	High
14	Egypt, Arab Rep.	-0.7286	6.1820	-0.0104	0.0880	-0.7286	High
15	Indonesia	-0.3521	-0.1079	-0.7684	0.0384	-0.7684	High
16	Moldova	-1.0906	-0.1336	0.0537	0.4066	-1.0906	High
17	Algeria	-1.1259	0.6792	0.0485	0.3263	-1.1259	High
18	Azerbaijan	-1.1307	-0.1947	-0.0490	-0.1274	-1.1307	High
19	Sri Lanka	-1.1728	0.2479	0.2155	0.1106	-1.1728	High
20	Albania	-1.3354	0.2174	0.3530	0.0087	-1.3354	High
21	Bolivia	-1.3501	-0.0127	1.0776	0.1358	-1.3501	High
22	Thailand	-1.4884	0.0397	0.1841	0.2832	-1.4884	High
23	Paraguay	-1.5511	-0.0554	0.1272	0.4703	-1.5511	High
24	Peru	-1.8648	0.0031	0.4521	0.2295	-1.8648	High
25	Vietnam	-2.9515	0.0398	0.2068	-0.4065	-2.9515	High
26	Armenia	-3.1400	-0.0416	-0.0641	-0.1680	-3.1400	High
27	Mongolia	-3.6962	-0.3069	1.0265	-0.3597	-3.6962	High
28	China	-4.4477	-1.0564	-0.0481	-0.1190	-4.4477	High
1	Zimbabwe	1.7442	0.1113	0.1592	0.2458	0.1113	Medium
2	Cameroon	1.1687	0.0235	0.3764	0.2280	0.0235	Medium
3	Zambia	0.4769	0.0204	0.2140	0.4963	0.0204	Medium
4	Namibia	0.0042	0.1589	2.0563	0.3261	0.0042	Medium
5	Angola	0.3249	-0.0247	0.3900	0.1919	-0.0247	Medium
6	El Salvador	-0.3191	-0.0506	0.1317	0.2706	-0.3191	Medium
7	Pakistan	-0.3479	1.3821	0.0159	0.2009	-0.3479	Medium

8	Honduras	-0.5559	-0.0263	0.6949	0.3103	-0.5559	Medium
9	Bangladesh	-0.5700	-0.0097	0.0592	0.1817	-0.5700	Medium
10	Kenya	-0.5851	-0.2006	0.1136	2.6713	-0.5851	Medium
11	Ghana	-0.6077	0.0412	0.1307	0.1362	-0.6077	Medium
12	Guatemala	-0.6090	-0.0225	0.2461	0.3043	-0.6090	Medium
13	Nicaragua	-0.7607	-0.0134	0.7402	0.2790	-0.7607	Medium
14	Nepal	-0.8091	0.0547	0.1491	0.3300	-0.8091	Medium
15	Tajikistan	-0.8907	0.1265	0.0342	0.3148	-0.8907	Medium
16	Cambodia	-0.9333	0.0132	0.1939	1.0878	-0.9333	Medium
17	India	-1.2156	-0.2408	0.0843	0.3650	-1.2156	Medium
18	Morocco	-1.6358	0.9773	0.0692	0.0086	-1.6358	Medium
19	Kyrgyz Republic	-2.0540	0.5516	0.2522	0.0200	-2.0540	Medium
1	Gambia, The	0.2348	0.0498	0.1033	0.4350	0.0498	Low
2	Cote d'Ivoire	0.7078	0.0328	0.2509	0.0998	0.0328	Low
3	Yemen, Rep.	0.0258	1.0012	0.0958	0.4179	0.0258	Low
4	Ethiopia	0.1148	-0.0222	0.0657	2.8972	-0.0222	Low
5	Malawi	-0.1085	0.0184	0.0741	0.4219	-0.1085	Low
6	Togo	-0.2043	0.0079	0.0631	0.3522	-0.2043	Low
7	Senegal	-0.2183	-0.0359	0.0608	0.1647	-0.2183	Low
8	Mozambique	-0.2779	0.0095	0.4370	0.2264	-0.2779	Low
9	Tanzania	-0.4779	0.0378	0.3202	1.3581	-0.4779	Low
10	Burkina Faso	-0.5308	-0.0191	-0.0090	0.0609	-0.5308	Low
11	Mali	-0.5343	-0.0615	0.0638	0.4370	-0.5343	Low
12	Benin	-0.5384	0.0238	0.0467	-0.0346	-0.5384	Low
13	Uganda	-0.5559	0.3804	0.1519	0.8551	-0.5559	Low

Source: Authors' calculations.

Note: Observations in bold indicate the minimum among all indicators. The ranking presented in this table is based on the following four categories: (a) the GEP Index; (b) greenhouse gas emissions; (c) Water stress; and (d) Land Use related biodiversity loss. If the categories considered change, the ranking would vary as well. Note that each dashboard indicator is multiplied by its weight, while the GEP Index is multiplied by the average of the weights (see PAGE (2017a)).

ANNEX II - GEP+ using original framework from PAGE (2017b)

As in PAGE (2017b), this annex includes the following indicators in the dashboard: (a) greenhouse gas emissions per capita; (b) nitrogen emissions per capita; (c) share of land use for permanent crops; (d) freshwater withdrawal per capita; and (e) the Inclusive Wealth Index.⁴⁸

The threshold for greenhouse gas emissions per capita is based on projections of the Intergovernmental Panel on Climate Change (IPCC). The IPCC currently estimates the cap for greenhouse gas emissions concentrations (measured in CO₂-equivalents) at roughly 450 parts per million (ppm) in order to limit global average warming to 2 degrees Celsius. This would be equivalent to a 50 per cent reduction in global emissions by 2050 (compared to 1990 levels), and corresponds to an average 2 tCO₂e per capita per year (United Kingdom Committee on Climate Change, 2008).

The planetary boundaries framework of Rockström et al. (2009) identifies nine areas of crucial importance to maintain the sustainability of life on the planet. For seven of these, it was possible to quantify a threshold by identifying control variables and setting specific boundary values. Planetary boundaries were set at what was considered a "safe distance" from the estimated threshold given the precautionary principle, using the best available science (Nykqvist et al., 2013). Thresholds for nitrogen concentrations, freshwater use⁴⁹ and land use are determined as the national level counterpart of planetary boundaries (dividing total estimates by either global population or by global terrestrial area) (Nykqvist et al., 2013).⁵⁰

Table AII.1: Dashboard indicators

<i>Description of indicator</i>	<i>Country coverage</i>	<i>Threshold</i>	<i>Data Source</i>
Freshwater withdrawal (m³/capita/year)	49	585 m ³ / capita /year	WDI
Greenhouse gas emissions, excluding land-use change and forestry (CO₂e/capita/year)	177	2 tons/capita/year	CAIT World Resource Institute
Nitrogen emissions (kg/capita/year)	103	5 kg/capita/year	FAO through UNEP GRID
Land use (share of land used for permanent crops)	181	15% land use (for permanent crops)	FAO through UNEP GRID
Inclusive Wealth Index (millions of constant 2005 US\$/capita)	100	non-negative change	UNU-IHDP and UNEP

⁴⁸ Ecological footprint was excluded of the framework.

⁴⁹ One alternative indicator that could have been included instead is water scarcity. However, as one of the selection criterion is country coverage, freshwater use was preferred. For future thematic studies of the GEP measurement framework, water scarcity indices could be included in the analysis of green economy progress for a sub-set of countries.

⁵⁰ The blueDot project (<http://bluedot.world/>) has calculated national planetary boundaries for six out of the ten planetary boundary indicators for 42 countries. These are, however, mainly OECD and developed countries. This study aims for a balance between developed and developing country coverage and has therefore privileged planetary boundaries based on the downscaling of global estimates. blueDot estimates of planetary boundaries could be used in a future study of the GEP.

A. Indicators for the Dashboard of Sustainability

Freshwater withdrawal (m³/capita/year)

Country	Current sustainability			Progress of sustainability				
	2000-2004 average value of freshwater withdrawal = y^0	2015-2019 average value of freshwater withdrawal = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{w}$	progress on freshwater withdrawal
Latvia	180.94	207.61	585.00	26.67	0.15	130.17	0.31	-0.53
Lithuania	812.65	804.43	585.00	-8.21	-0.01	559.28	1.39	0.03
Luxembourg	134.92	110.82	585.00	-24.10	-0.18	92.86	0.23	0.57
Macedonia, FYR	285.38	487.86	585.00	202.48	0.71	205.30	0.49	-2.53
Malawi	111.09	82.93	585.00	-28.16	-0.25	79.44	0.19	0.89
Malaysia	381.14	376.89	585.00	-4.25	-0.01	274.19	0.65	0.04
Mexico	680.26	660.44	585.00	-19.82	-0.03	489.38	1.16	0.10
Morocco	430.21	382.03	585.00	-48.18	-0.11	309.49	0.74	0.40
Mozambique	45.77	34.23	585.00	-11.54	-0.25	32.73	0.08	0.89
Namibia	147.07	125.04	585.00	-22.03	-0.15	105.80	0.25	0.53
Nepal	396.72	341.65	585.00	-55.07	-0.14	283.69	0.68	0.49
Netherlands	552.61	632.32	585.00	79.71	0.14	380.32	0.94	-0.46
New Zealand	1203.75	1063.12	585.00	-140.63	-0.12	585.00	2.06	0.23
Nicaragua	264.45	255.97	585.00	-8.48	-0.03	190.25	0.45	0.11
Norway	527.31	578.07	585.00	50.76	0.10	362.90	0.90	-0.31
Pakistan	1153.02	1015.84	585.00	-137.18	-0.12	585.00	1.97	0.24
Paraguay	87.95	357.78	585.00	269.83	3.07	63.27	0.15	-10.93
Poland	336.91	310.38	585.00	-26.52	-0.08	231.87	0.58	0.25
Portugal	812.22	809.10	585.00	-3.12	0.00	558.98	1.39	0.01
Russian Federation	455.27	461.32	585.00	6.05	0.01	327.52	0.78	-0.05
Senegal	213.76	157.15	585.00	-56.62	-0.26	152.86	0.37	0.93
Slovak Republic	211.46	127.08	585.00	-84.38	-0.40	145.53	0.36	1.28
Slovenia	156.43	457.54	585.00	301.12	1.92	107.66	0.27	-6.17
South Africa	272.87	235.93	585.00	-36.94	-0.14	196.31	0.47	0.48
Spain	869.87	695.01	585.00	-174.86	-0.20	585.00	1.49	0.61
Sri Lanka	687.60	632.23	585.00	-55.36	-0.08	494.66	1.18	0.29
Sweden	299.50	272.71	585.00	-26.79	-0.09	206.12	0.51	0.29
Switzerland	358.83	323.46	585.00	-35.38	-0.10	246.96	0.61	0.32
Tajikistan	1867.55	1399.88	585.00	-467.67	-0.25	585.00	3.19	0.36
Togo	32.98	24.79	585.00	-8.19	-0.25	23.59	0.06	0.87
Tunisia	291.35	261.79	585.00	-29.56	-0.10	209.60	0.50	0.36
Turkey	645.93	535.15	585.00	-110.79	-0.17	464.68	1.10	0.61
Uganda	12.23	8.45	585.00	-3.79	-0.31	8.75	0.02	1.09
United Kingdom	262.59	203.29	585.00	-59.30	-0.23	180.72	0.45	0.72
United States	1645.89	1513.31	585.00	-132.59	-0.08	585.00	2.81	0.12
Uruguay	1099.93	1074.24	585.00	-25.69	-0.02	585.00	1.88	0.05
Venezuela, RB	357.79	744.28	585.00	386.50	1.08	257.39	0.61	-3.85
Yemen, Rep.	183.28	146.06	585.00	-37.22	-0.20	131.06	0.31	0.71
Zambia	147.95	108.13	585.00	-39.82	-0.27	105.80	0.25	0.94

Zimbabwe	332.65	297.18	585.00	-35.47	-0.11	237.88	0.57	0.37
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Source: Authors' calculations.

Greenhouse gas emissions (CO₂e/capita/year)

Country	Current sustainability			Progress of sustainability				
	2000-2004 average value of greenhouse gas emissions = y^0	2015-2019 average value of greenhouse gas emissions = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	progress on greenhouse gas emissions
Albania	2.87	3.35	2.00	0.03	0.01	2.00	1.44	-0.55
Algeria	4.16	5.28	2.00	0.07	0.02	2.00	2.08	-0.52
Angola	3.37	3.22	2.00	-0.01	0.00	2.00	1.69	0.11
Argentina	7.91	8.69	2.00	0.05	0.01	2.00	3.96	-0.13
Australia	31.20	24.75	2.00	-0.43	-0.01	2.00	15.60	0.22
Austria	10.51	8.83	2.00	-0.11	-0.01	2.00	5.25	0.20
Azerbaijan	7.39	8.49	2.00	0.07	0.01	2.00	3.70	-0.20
Bangladesh	0.91	1.21	2.00	0.02	0.02	0.62	0.45	-1.03
Belarus	7.95	8.86	2.00	0.06	0.01	2.00	3.98	-0.15
Belgium	13.08	9.79	2.00	-0.22	-0.02	2.00	6.54	0.30
Benin	1.17	1.43	2.00	0.02	0.02	0.79	0.58	-0.70
Bolivia	3.77	4.98	2.00	0.08	0.02	2.00	1.89	-0.68
Brazil	4.57	5.19	2.00	0.04	0.01	2.00	2.29	-0.24
Bulgaria	7.57	7.80	2.00	0.02	0.00	2.00	3.79	-0.04
Cambodia	1.75	2.23	2.00	0.03	0.02	1.29	0.88	-1.04
Cameroon	5.04	3.72	2.00	-0.09	-0.02	2.00	2.52	0.43
Canada	21.89	19.45	2.00	-0.16	-0.01	2.00	10.95	0.12
Chile	4.58	5.88	2.00	0.09	0.02	2.00	2.29	-0.51
China	4.16	8.65	2.00	0.30	0.07	2.00	2.08	-2.07
Colombia	3.47	3.89	2.00	0.03	0.01	2.00	1.73	-0.28
Costa Rica	2.71	3.09	2.00	0.03	0.01	2.00	1.36	-0.54
Cote d'Ivoire	1.73	0.96	2.00	-0.05	-0.03	1.17	0.86	1.38
Croatia	6.22	5.42	2.00	-0.05	-0.01	2.00	3.11	0.19
Cyprus	8.61	7.17	2.00	-0.10	-0.01	2.00	4.31	0.22
Czech Republic	13.94	11.69	2.00	-0.15	-0.01	2.00	6.97	0.19
Denmark	13.05	8.22	2.00	-0.32	-0.02	2.00	6.53	0.44
Dominican Republic	3.27	3.58	2.00	0.02	0.01	2.00	1.63	-0.24
Ecuador	3.52	4.00	2.00	0.03	0.01	2.00	1.76	-0.32
Egypt, Arab Rep.	2.78	3.29	2.00	0.03	0.01	2.00	1.39	-0.66
El Salvador	1.95	2.00	2.00	0.00	0.00	1.44	0.98	-0.09
Estonia	13.35	14.18	2.00	0.06	0.00	2.00	6.67	-0.07
Finland	14.78	10.04	2.00	-0.32	-0.02	2.00	7.39	0.37
France	8.10	6.17	2.00	-0.13	-0.02	2.00	4.05	0.32
Georgia	2.99	4.57	2.00	0.11	0.04	2.00	1.50	-1.59
Germany	11.80	10.35	2.00	-0.10	-0.01	2.00	5.90	0.15
Ghana	1.09	1.49	2.00	0.03	0.02	0.74	0.55	-1.12
Greece	11.00	8.11	2.00	-0.19	-0.02	2.00	5.50	0.32
Guatemala	1.84	2.16	2.00	0.02	0.01	1.36	0.92	-0.65
Honduras	2.16	2.36	2.00	0.01	0.01	1.59	1.08	-0.35
Hungary	7.15	5.99	2.00	-0.08	-0.01	2.00	3.58	0.23

India	1.63	2.34	2.00	0.05	0.03	1.20	0.81	-1.67
Indonesia	3.17	3.31	2.00	0.01	0.00	2.00	1.58	-0.12
Ireland	18.45	13.67	2.00	-0.32	-0.02	2.00	9.23	0.29
Israel	11.48	10.65	2.00	-0.06	0.00	2.00	5.74	0.09
Italy	9.07	6.69	2.00	-0.16	-0.02	2.00	4.54	0.34
Jamaica	4.49	3.10	2.00	-0.09	-0.02	2.00	2.24	0.56
Japan	9.86	9.92	2.00	0.00	0.00	2.00	4.93	-0.01
Jordan	3.99	3.76	2.00	-0.02	0.00	2.00	2.00	0.12
Kazakhstan	11.16	16.25	2.00	0.34	0.03	2.00	5.58	-0.56
Kenya	1.21	1.57	2.00	0.02	0.02	0.82	0.60	-0.93
Korea, Rep.	11.11	13.53	2.00	0.16	0.01	2.00	5.55	-0.27
Kyrgyz Republic	2.02	2.84	2.00	0.05	0.03	1.49	1.01	-1.55
Latvia	4.75	5.79	2.00	0.07	0.01	2.00	2.38	-0.38
Lithuania	5.86	6.54	2.00	0.05	0.01	2.00	2.93	-0.18
Luxembourg	24.07	17.21	2.00	-0.46	-0.02	2.00	12.03	0.31
Malawi	0.81	0.93	2.00	0.01	0.01	0.55	0.41	-0.46
Malaysia	7.56	9.62	2.00	0.14	0.02	2.00	3.78	-0.37
Mali	2.08	2.20	2.00	0.01	0.00	1.41	1.04	-0.17
Mexico	5.36	5.48	2.00	0.01	0.00	2.00	2.68	-0.04
Moldova	4.11	4.56	2.00	0.03	0.01	2.00	2.05	-0.21
Mongolia	10.93	15.47	2.00	0.30	0.03	2.00	5.47	-0.51
Morocco	1.96	2.57	2.00	0.04	0.02	1.44	0.98	-1.19
Mozambique	1.29	1.31	2.00	0.00	0.00	0.88	0.65	-0.03
Namibia	5.84	5.31	2.00	-0.04	-0.01	2.00	2.92	0.14
Nepal	1.25	1.67	2.00	0.03	0.02	0.85	0.62	-1.05
Netherlands	12.90	11.02	2.00	-0.13	-0.01	2.00	6.45	0.17
New Zealand	20.45	17.42	2.00	-0.20	-0.01	2.00	10.22	0.16
Nicaragua	2.58	3.04	2.00	0.03	0.01	1.90	1.29	-0.68
Norway	10.65	9.02	2.00	-0.11	-0.01	2.00	5.33	0.19
Pakistan	1.61	1.84	2.00	0.02	0.01	1.09	0.81	-0.44
Panama	3.51	4.68	2.00	0.08	0.02	2.00	1.76	-0.77
Paraguay	5.90	7.00	2.00	0.07	0.01	2.00	2.95	-0.28
Peru	2.32	3.12	2.00	0.05	0.02	1.71	1.16	-1.32
Philippines	1.78	1.97	2.00	0.01	0.01	1.31	0.89	-0.41
Poland	9.76	9.79	2.00	0.00	0.00	2.00	4.88	0.00
Portugal	7.65	6.52	2.00	-0.08	-0.01	2.00	3.83	0.20
Russian Federation	15.60	16.86	2.00	0.08	0.01	2.00	7.80	-0.09
Senegal	1.95	1.99	2.00	0.00	0.00	1.33	0.98	-0.05
Singapore	13.00	11.18	2.00	-0.12	-0.01	2.00	6.50	0.17
Slovak Republic	8.62	7.03	2.00	-0.11	-0.01	2.00	4.31	0.24
Slovenia	9.50	8.10	2.00	-0.09	-0.01	2.00	4.75	0.19
South Africa	8.54	8.86	2.00	0.02	0.00	2.00	4.27	-0.05
Spain	9.26	6.91	2.00	-0.16	-0.02	2.00	4.63	0.32
Sri Lanka	1.16	1.62	2.00	0.03	0.03	0.86	0.58	-1.49
Sweden	7.55	5.06	2.00	-0.17	-0.02	2.00	3.78	0.45
Switzerland	7.31	5.76	2.00	-0.10	-0.01	2.00	3.65	0.29
Tajikistan	1.08	1.51	2.00	0.03	0.03	0.80	0.54	-1.50
Thailand	4.38	5.74	2.00	0.09	0.02	2.00	2.19	-0.57
Togo	1.07	1.17	2.00	0.01	0.01	0.73	0.54	-0.30
Tunisia	3.19	3.56	2.00	0.02	0.01	2.00	1.60	-0.30

Turkey	4.28	5.65	2.00	0.09	0.02	2.00	2.14	-0.60
Uganda	1.00	1.35	2.00	0.02	0.02	0.68	0.50	-1.07
Ukraine	9.11	6.31	2.00	-0.19	-0.02	2.00	4.55	0.39
United Kingdom	11.60	7.43	2.00	-0.28	-0.02	2.00	5.80	0.43
United States	23.52	18.50	2.00	-0.33	-0.01	2.00	11.76	0.23
Uruguay	9.91	10.80	2.00	0.06	0.01	2.00	4.96	-0.11
Venezuela, RB	9.01	8.77	2.00	-0.02	0.00	2.00	4.51	0.03
Vietnam	1.88	3.48	2.00	0.11	0.06	1.39	0.94	-3.24
Yemen, Rep.	1.35	0.92	2.00	-0.03	-0.02	0.92	0.68	1.00
Zambia	2.76	2.55	2.00	-0.01	-0.01	1.87	1.38	0.24
Zimbabwe	2.47	2.19	2.00	-0.02	-0.01	1.68	1.23	0.35

Source: Authors' calculations.

Emissions of nitrogen (kg/capita/year)

Country	Current sustainability			Progress of sustainability				
	2000-2004 average value of emissions of nitrogen = y^0	2015-2019 average value of emissions of nitrogen = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	progress on emissions of nitrogen
Albania	12.19	11.82	5.00	-0.37	-0.03	5.00	2.44	0.05
Algeria	1.50	1.45	5.00	-0.05	-0.03	0.70	0.30	0.06
Angola	0.25	0.42	5.00	0.17	0.67	0.06	0.05	-0.89
Argentina	18.17	23.60	5.00	5.43	0.30	5.00	3.63	-0.41
Australia	104.70	107.52	5.00	2.82	0.03	5.00	20.94	-0.03
Austria	27.91	18.57	5.00	-9.34	-0.33	5.00	5.58	0.41
Azerbaijan	1.94	1.93	5.00	-0.01	0.00	0.90	0.39	0.01
Bangladesh	7.16	8.21	5.00	1.05	0.15	1.82	1.43	-0.20
Belarus	30.76	59.65	5.00	28.88	0.94	5.00	6.15	-1.12
Belgium	32.32	15.55	5.00	-16.77	-0.52	5.00	6.46	0.61
Benin	1.12	0.29	5.00	-0.84	-0.75	0.29	0.22	1.00
Bolivia	0.68	1.96	5.00	1.28	1.87	0.32	0.14	-3.50
Brazil	11.96	16.16	5.00	4.20	0.35	5.00	2.39	-0.60
Bulgaria	35.77	43.51	5.00	7.74	0.22	5.00	7.15	-0.25
Cambodia	0.53	1.87	5.00	1.35	2.56	0.25	0.11	-4.79
Cameroon	1.41	1.17	5.00	-0.24	-0.17	0.36	0.28	0.23
Canada	86.63	48.19	5.00	-38.44	-0.44	5.00	17.33	0.47
Chile	15.83	9.54	5.00	-6.30	-0.40	5.00	3.17	0.58
China	21.78	29.59	5.00	7.81	0.36	5.00	4.36	-0.47
Colombia	8.59	12.14	5.00	3.55	0.41	4.00	1.72	-0.78
Costa Rica	13.06	12.76	5.00	-0.30	-0.02	5.00	2.61	0.04
Cote d'Ivoire	1.78	1.37	5.00	-0.41	-0.23	0.45	0.36	0.31
Croatia	29.95	14.42	5.00	-15.53	-0.52	5.00	5.99	0.62
Cyprus	8.83	7.16	5.00	-1.67	-0.19	3.77	1.77	0.33
Czech Republic	27.18	15.96	5.00	-11.22	-0.41	5.00	5.44	0.51
Denmark	41.26	19.23	5.00	-22.03	-0.53	5.00	8.25	0.61
Dominican Republic	4.93	5.58	5.00	0.65	0.13	2.30	0.99	-0.25
Ecuador	9.74	11.13	5.00	1.40	0.14	4.54	1.95	-0.27
Egypt, Arab Rep.	19.41	17.60	5.00	-1.81	-0.09	5.00	3.88	0.13
El Salvador	6.52	12.53	5.00	6.01	0.92	3.04	1.30	-1.73
Estonia	34.05	24.81	5.00	-9.24	-0.27	5.00	6.81	0.32
Finland	45.19	22.88	5.00	-22.31	-0.49	5.00	9.04	0.56
France	25.90	12.51	5.00	-13.38	-0.52	5.00	5.18	0.64
Georgia	3.58	1.45	5.00	-2.13	-0.60	1.67	0.72	1.11
Germany	22.05	15.71	5.00	-6.34	-0.29	5.00	4.41	0.37
Ghana	0.30	1.45	5.00	1.15	3.77	0.08	0.06	-5.05
Greece	40.03	24.27	5.00	-15.76	-0.39	5.00	8.01	0.45
Guatemala	9.43	11.09	5.00	1.66	0.18	4.39	1.89	-0.33
Honduras	7.75	5.87	5.00	-1.89	-0.24	3.61	1.55	0.46
Hungary	18.01	12.44	5.00	-5.57	-0.31	5.00	3.60	0.43

India	10.13	13.96	5.00	3.82	0.38	4.72	2.03	-0.71
Indonesia	9.78	11.78	5.00	2.00	0.20	4.56	1.96	-0.38
Ireland	43.55	23.24	5.00	-20.31	-0.47	5.00	8.71	0.53
Israel	34.42	12.79	5.00	-21.64	-0.63	5.00	6.88	0.74
Italy	25.06	11.53	5.00	-13.53	-0.54	5.00	5.01	0.67
Jamaica	3.53	1.93	5.00	-1.60	-0.45	1.64	0.71	0.85
Japan	15.88	10.57	5.00	-5.31	-0.33	5.00	3.18	0.49
Jordan	10.87	3.96	5.00	-6.91	-0.64	5.00	2.17	1.18
Kazakhstan	1.28	1.41	5.00	0.14	0.11	0.59	0.26	-0.20
Kenya	1.92	1.76	5.00	-0.16	-0.08	0.49	0.38	0.11
Korea, Rep.	26.35	23.46	5.00	-2.89	-0.11	5.00	5.27	0.14
Kyrgyz Republic	4.47	4.40	5.00	-0.07	-0.02	2.08	0.89	0.03
Latvia	18.99	17.23	5.00	-1.76	-0.09	5.00	3.80	0.13
Lithuania	18.69	20.42	5.00	1.72	0.09	5.00	3.74	-0.13
Luxembourg	100.79	41.26	5.00	-59.53	-0.59	5.00	20.16	0.62
Macedonia, FYR	5.77	8.94	5.00	3.17	0.55	2.69	1.15	-1.03
Malawi	5.24	5.63	5.00	0.39	0.08	1.33	1.05	-0.10
Malaysia	19.34	35.48	5.00	16.14	0.83	5.00	3.87	-1.13
Mali	13.20	6.72	5.00	-6.48	-0.49	3.35	2.64	0.66
Mexico	8.45	15.46	5.00	7.01	0.83	3.94	1.69	-1.55
Moldova	3.89	5.00	5.00	1.11	0.28	1.81	0.78	-0.53
Mongolia	1.93	4.06	5.00	2.13	1.11	0.90	0.39	-2.07
Morocco	7.74	6.00	5.00	-1.74	-0.22	3.61	1.55	0.42
Mozambique	0.39	1.57	5.00	1.18	3.00	0.10	0.08	-4.02
Namibia	0.96	1.75	5.00	0.79	0.82	0.45	0.19	-1.54
Nepal	0.48	1.79	5.00	1.30	2.69	0.12	0.10	-3.60
Netherlands	26.15	14.19	5.00	-11.96	-0.46	5.00	5.23	0.57
New Zealand	38.96	35.50	5.00	-3.46	-0.09	5.00	7.79	0.10
Nicaragua	6.60	8.08	5.00	1.48	0.22	3.08	1.32	-0.42
Norway	47.92	31.88	5.00	-16.04	-0.33	5.00	9.58	0.37
Pakistan	16.20	19.59	5.00	3.38	0.21	4.12	3.24	-0.28
Panama	4.94	6.17	5.00	1.22	0.25	2.30	0.99	-0.46
Paraguay	7.45	13.97	5.00	6.52	0.87	3.47	1.49	-1.64
Peru	7.70	8.06	5.00	0.36	0.05	3.59	1.54	-0.09
Philippines	6.64	5.63	5.00	-1.01	-0.15	3.09	1.33	0.29
Poland	21.56	19.73	5.00	-1.83	-0.08	5.00	4.31	0.11
Portugal	26.43	15.19	5.00	-11.24	-0.43	5.00	5.29	0.52
Russian Federation	5.39	23.72	5.00	18.33	3.40	2.51	1.08	-6.37
Senegal	1.63	1.60	5.00	-0.03	-0.02	0.41	0.33	0.02
Singapore	1.43	0.25	5.00	-1.18	-0.83	0.61	0.29	1.44
Slovak Republic	19.34	12.56	5.00	-6.78	-0.35	5.00	3.87	0.47
Slovenia	28.94	16.74	5.00	-12.20	-0.42	5.00	5.79	0.51
South Africa	9.53	7.69	5.00	-1.83	-0.19	4.44	1.91	0.36
Spain	32.61	15.99	5.00	-16.62	-0.51	5.00	6.52	0.60
Sri Lanka	8.74	9.04	5.00	0.30	0.03	4.07	1.75	-0.06
Sweden	22.22	13.16	5.00	-9.06	-0.41	5.00	4.44	0.53
Switzerland	13.25	8.17	5.00	-5.08	-0.38	5.00	2.65	0.62
Tajikistan	3.96	6.21	5.00	2.25	0.57	1.85	0.79	-1.06
Thailand	17.67	23.59	5.00	5.92	0.33	5.00	3.53	-0.47
Togo	0.97	0.18	5.00	-0.79	-0.81	0.25	0.19	1.09

Tunisia	4.69	6.03	5.00	1.35	0.29	2.18	0.94	-0.54
Turkey	19.17	9.71	5.00	-9.46	-0.49	5.00	3.83	0.67
Uganda	0.15	0.20	5.00	0.05	0.36	0.04	0.03	-0.49
Ukraine	8.00	18.28	5.00	10.28	1.28	3.73	1.60	-2.41
United Kingdom	32.14	13.71	5.00	-18.43	-0.57	5.00	6.43	0.68
United States	69.71	31.24	5.00	-38.46	-0.55	5.00	13.94	0.59
Uruguay	17.68	30.37	5.00	12.69	0.72	5.00	3.54	-1.00
Venezuela, RB	10.95	9.74	5.00	-1.20	-0.11	5.00	2.19	0.20
Vietnam	16.19	11.64	5.00	-4.56	-0.28	5.00	3.24	0.41
Yemen, Rep.	0.58	0.82	5.00	0.24	0.42	0.15	0.12	-0.57
Zambia	4.37	7.21	5.00	2.84	0.65	1.11	0.87	-0.87
Zimbabwe	5.26	4.50	5.00	-0.76	-0.14	1.34	1.05	0.19

Source: Authors' calculations.

Land use (share of land used for permanent crops)

Country	Current sustainability			Progress of sustainability				
	2000-2004 average value of land use = y^0	2015-2019 average value of land use = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	progress on land use
Albania	4.42	3.00	15.00	-0.09	-0.02	2.71	0.29	0.83
Algeria	0.28	0.42	15.00	0.01	0.03	0.20	0.02	-1.76
Angola	0.24	0.23	15.00	0.00	0.00	0.17	0.02	0.05
Argentina	0.37	0.37	15.00	0.00	0.00	0.19	0.02	0.00
Australia	0.04	0.04	15.00	0.00	0.00	0.02	0.00	-0.05
Austria	0.85	0.80	15.00	0.00	0.00	0.45	0.06	0.11
Azerbaijan	2.76	2.89	15.00	0.01	0.00	1.69	0.18	-0.13
Bangladesh	3.89	6.38	15.00	0.17	0.04	2.74	0.26	-2.17
Belarus	0.60	0.55	15.00	0.00	-0.01	0.37	0.04	0.20
Belgium	0.69	0.75	15.00	0.00	0.01	0.37	0.05	-0.18
Benin	2.36	4.43	15.00	0.14	0.06	1.66	0.16	-2.98
Bolivia	0.17	0.21	15.00	0.00	0.02	0.12	0.01	-0.92
Brazil	0.88	0.79	15.00	-0.01	-0.01	0.54	0.06	0.28
Bulgaria	2.10	1.26	15.00	-0.06	-0.03	1.29	0.14	1.03
Cambodia	0.83	0.88	15.00	0.00	0.00	0.58	0.06	-0.21
Cameroon	2.56	3.28	15.00	0.05	0.02	1.80	0.17	-0.95
Canada	0.71	0.51	15.00	-0.01	-0.02	0.38	0.05	0.59
Chile	0.55	0.61	15.00	0.00	0.01	0.29	0.04	-0.26
China	1.21	1.70	15.00	0.03	0.03	0.74	0.08	-1.05
Colombia	1.43	1.72	15.00	0.02	0.01	0.87	0.10	-0.53
Costa Rica	5.60	6.09	15.00	0.03	0.01	3.43	0.37	-0.23
Cote d'Ivoire	12.08	14.15	15.00	0.14	0.01	8.51	0.81	-0.58
Croatia	1.25	1.32	15.00	0.00	0.00	0.66	0.08	-0.11
Cyprus	4.44	2.85	15.00	-0.11	-0.02	2.35	0.30	0.76
Czech Republic	0.98	0.58	15.00	-0.03	-0.03	0.52	0.07	0.88
Denmark	0.18	0.07	15.00	-0.01	-0.04	0.10	0.01	1.28
Dominican Republic	8.60	7.35	15.00	-0.08	-0.01	6.06	0.57	0.49
Ecuador	5.10	5.88	15.00	0.05	0.01	3.13	0.34	-0.39
Egypt, Arab Rep.	0.50	0.94	15.00	0.03	0.06	0.35	0.03	-3.02
El Salvador	12.26	10.14	15.00	-0.14	-0.01	8.63	0.82	0.59
Estonia	0.37	0.07	15.00	-0.02	-0.05	0.20	0.02	1.74
Finland	0.01	0.01	15.00	0.00	-0.01	0.01	0.00	0.45
France	2.06	1.81	15.00	-0.02	-0.01	1.09	0.14	0.26
Georgia	3.36	1.58	15.00	-0.12	-0.04	2.06	0.22	1.36
Germany	0.60	0.58	15.00	0.00	0.00	0.32	0.04	0.05
Ghana	10.20	11.87	15.00	0.11	0.01	7.18	0.68	-0.55
Greece	8.75	8.63	15.00	-0.01	0.00	4.64	0.58	0.03
Guatemala	5.76	11.04	15.00	0.35	0.06	4.06	0.38	-3.10
Honduras	3.29	4.07	15.00	0.05	0.02	2.32	0.22	-0.80
Hungary	2.21	1.96	15.00	-0.02	-0.01	1.17	0.15	0.24

India	3.26	4.37	15.00	0.07	0.02	2.30	0.22	-1.15
Indonesia	9.30	12.42	15.00	0.21	0.02	6.55	0.62	-1.14
Ireland	0.03	0.01	15.00	0.00	-0.03	0.02	0.00	1.06
Israel	3.78	4.48	15.00	0.05	0.01	2.01	0.25	-0.39
Italy	9.07	8.33	15.00	-0.05	-0.01	4.81	0.60	0.17
Jamaica	10.16	8.77	15.00	-0.09	-0.01	6.22	0.68	0.35
Japan	0.95	0.79	15.00	-0.01	-0.01	0.50	0.06	0.34
Jordan	0.99	0.97	15.00	0.00	0.00	0.61	0.07	0.03
Kazakhstan	0.05	0.05	15.00	0.00	0.00	0.03	0.00	-0.14
Kenya	0.77	0.93	15.00	0.01	0.01	0.54	0.05	-0.73
Korea, Rep.	1.98	2.24	15.00	0.02	0.01	1.05	0.13	-0.28
Kyrgyz Republic	0.35	0.39	15.00	0.00	0.01	0.25	0.02	-0.40
Latvia	0.19	0.12	15.00	0.00	-0.03	0.12	0.01	1.00
Lithuania	0.65	0.56	15.00	-0.01	-0.01	0.35	0.04	0.32
Luxembourg	0.41	0.64	15.00	0.01	0.04	0.22	0.03	-1.16
Malawi	1.38	1.48	15.00	0.01	0.01	0.97	0.09	-0.26
Malaysia	17.74	22.71	15.00	0.33	0.02	10.87	1.18	-0.72
Mali	0.12	0.12	15.00	0.00	0.00	0.08	0.01	-0.21
Mexico	1.26	1.37	15.00	0.01	0.01	0.77	0.08	-0.22
Moldova	9.35	8.48	15.00	-0.06	-0.01	6.59	0.62	0.31
Mongolia	0.00	0.00	15.00	0.00	0.10	0.00	0.00	-5.07
Morocco	1.93	3.27	15.00	0.09	0.05	1.36	0.13	-2.37
Mozambique	0.32	0.38	15.00	0.00	0.01	0.22	0.02	-0.68
Namibia	0.01	0.01	15.00	0.00	0.07	0.00	0.00	-3.54
Nepal	0.84	1.48	15.00	0.04	0.05	0.59	0.06	-2.57
Netherlands	0.97	1.13	15.00	0.01	0.01	0.51	0.06	-0.36
New Zealand	0.21	0.28	15.00	0.00	0.02	0.11	0.01	-0.71
Nicaragua	2.16	2.38	15.00	0.01	0.01	1.52	0.14	-0.34
Norway	0.01	0.01	15.00	0.00	-0.03	0.01	0.00	0.84
Pakistan	0.88	1.04	15.00	0.01	0.01	0.62	0.06	-0.63
Panama	2.12	2.49	15.00	0.02	0.01	1.30	0.14	-0.45
Paraguay	0.24	0.21	15.00	0.00	-0.01	0.17	0.02	0.41
Peru	0.76	1.08	15.00	0.02	0.03	0.47	0.05	-1.08
Philippines	15.91	17.94	15.00	0.14	0.01	11.21	1.06	-0.43
Poland	1.09	1.28	15.00	0.01	0.01	0.58	0.07	-0.37
Portugal	8.44	8.25	15.00	-0.01	0.00	4.48	0.56	0.05
Russian Federation	0.11	0.10	15.00	0.00	-0.01	0.07	0.01	0.33
Senegal	0.26	0.35	15.00	0.01	0.02	0.19	0.02	-1.13
Singapore	0.27	0.14	15.00	-0.01	-0.03	0.14	0.02	1.00
Slovak Republic	0.66	0.37	15.00	-0.02	-0.03	0.35	0.04	0.92
Slovenia	1.48	2.66	15.00	0.08	0.05	0.78	0.10	-1.70
South Africa	0.32	0.34	15.00	0.00	0.00	0.23	0.02	-0.17
Spain	9.92	9.61	15.00	-0.02	0.00	5.26	0.66	0.07
Sri Lanka	15.69	15.95	15.00	0.02	0.00	9.61	1.05	-0.04
Sweden	0.01	0.01	15.00	0.00	0.03	0.00	0.00	-1.03
Switzerland	0.60	0.63	15.00	0.00	0.00	0.32	0.04	-0.11
Tajikistan	0.71	0.96	15.00	0.02	0.02	0.50	0.05	-1.16
Thailand	6.83	8.81	15.00	0.13	0.02	4.18	0.46	-0.75
Togo	2.39	3.13	15.00	0.05	0.02	1.68	0.16	-1.04
Tunisia	13.76	15.01	15.00	0.08	0.01	8.43	0.92	-0.23

Turkey	3.40	4.30	15.00	0.06	0.02	2.08	0.23	-0.69
Uganda	10.66	10.97	15.00	0.02	0.00	7.51	0.71	-0.10
Ukraine	1.58	1.54	15.00	0.00	0.00	0.97	0.11	0.06
United Kingdom	0.21	0.20	15.00	0.00	0.00	0.11	0.01	0.10
United States	0.30	0.28	15.00	0.00	0.00	0.16	0.02	0.08
Uruguay	0.24	0.22	15.00	0.00	0.00	0.15	0.02	0.16
Venezuela, RB	0.86	0.79	15.00	0.00	-0.01	0.53	0.06	0.20
Vietnam	7.30	14.63	15.00	0.49	0.07	5.14	0.49	-3.39
Yemen, Rep.	0.37	0.56	15.00	0.01	0.04	0.26	0.02	-1.82
Zambia	0.05	0.05	15.00	0.00	0.00	0.03	0.00	-0.22
Zimbabwe	0.26	0.26	15.00	0.00	0.00	0.18	0.02	0.00

Source: Authors' calculations.

Inclusive Wealth Index (millions of constant 2005 US\$/capita)

Country	Current sustainability			Progress of sustainability				
	2000-2004 average value of Inclusive Wealth Index = y^0	2010-2014 average value of Inclusive Wealth Index = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	progress on Inclusive Wealth Index
Albania	35152	40462	16208	5310	0.15	41152	0.46	0.89
Algeria	41526	39731	16208	-1795	-0.04	49718	0.39	-0.22
Argentina	72220	77449	16208	5229	0.07	86010	0.22	0.38
Armenia	20595	23714	16208	3119	0.15	24110	0.79	0.89
Australia	484778	515734	16208	30956	0.06	577343	0.03	0.33
Austria	401707	444269	16208	42562	0.11	478410	0.04	0.55
Bangladesh	4737	5596	16208	859	0.18	16208	3.42	0.07
Belgium	388116	423145	16208	35029	0.09	462224	0.04	0.47
Benin	13053	12097	16208	-956	-0.07	16208	1.24	-0.30
Bolivia	121229	100680	16208	-20549	-0.17	145145	0.13	-0.86
Botswana	69860	73093	16208	3233	0.05	83642	0.23	0.23
Brazil	83761	84330	16208	569	0.01	98058	0.19	0.04
Bulgaria	44157	51614	16208	7457	0.17	51694	0.37	0.99
Cambodia	10192	9832	16208	-360	-0.04	16208	1.59	-0.06
Cameroon	25459	21956	16208	-3503	-0.14	29805	0.64	-0.81
Canada	471177	502972	16208	31795	0.07	561145	0.03	0.35
Chile	81403	96534	16208	15131	0.19	96946	0.20	0.97
China	18143	23834	16208	5691	0.31	21240	0.89	1.84
Colombia	71637	71622	16208	-15	0.00	83865	0.23	0.00
Costa Rica	66231	74003	16208	7772	0.12	77536	0.24	0.69
Cote d'Ivoire	16565	15999	16208	-566	-0.03	19392	0.98	-0.20
Croatia	145783	165767	16208	19984	0.14	173619	0.11	0.72
Cyprus	221860	247078	16208	25218	0.11	264223	0.07	0.60
Czech Republic	138370	155861	16208	17491	0.13	164791	0.12	0.66
Denmark	459731	504354	16208	44623	0.10	547513	0.04	0.51
Dominican Republic	39481	44690	16208	5209	0.13	47270	0.41	0.67
Ecuador	36802	34626	16208	-2176	-0.06	43084	0.44	-0.35
Egypt, Arab Rep.	13250	14531	16208	1281	0.10	16208	1.22	0.43
El Salvador	26668	31929	16208	5261	0.20	31929	0.61	1.00
Estonia	115684	139546	16208	23862	0.21	137773	0.14	1.08
Finland	397201	451725	16208	54524	0.14	473044	0.04	0.72
France	385197	425022	16208	39825	0.10	458748	0.04	0.54
Germany	376366	435655	16208	59289	0.16	448231	0.04	0.83
Ghana	9566	9310	16208	-256	-0.03	16208	1.69	-0.04
Greece	187027	216142	16208	29115	0.16	222739	0.09	0.82
Guatemala	31674	32799	16208	1125	0.04	37923	0.51	0.18
Honduras	31231	30993	16208	-238	-0.01	37392	0.52	-0.04
Hungary	126543	142741	16208	16198	0.13	150706	0.13	0.67
Iceland	760700	758631	16208	-2069	0.00	905950	0.02	-0.01
India	10914	12321	16208	1407	0.13	16208	1.49	0.27
Indonesia	22382	22680	16208	298	0.01	26797	0.72	0.07
Ireland	377775	430751	16208	52976	0.14	449909	0.04	0.73
Israel	231677	244871	16208	13194	0.06	275914	0.07	0.30
Italy	300806	324712	16208	23906	0.08	358243	0.05	0.42
Jamaica	65002	68149	16208	3147	0.05	76097	0.25	0.28
Japan	412783	432236	16208	19453	0.05	491601	0.04	0.25
Jordan	32813	34310	16208	1497	0.05	38414	0.49	0.27
Kazakhstan	98485	96288	16208	-2197	-0.02	115295	0.16	-0.13
Kenya	9122	9562	16208	440	0.05	16208	1.78	0.06

Korea, Rep.	161766	195033	16208	33267	0.21	192654	0.10	1.08
Kyrgyz Republic	7500	8037	16208	537	0.07	16208	2.16	0.06
Latvia	71199	91727	16208	20528	0.29	83352	0.23	1.69
Lithuania	77745	93788	16208	16043	0.21	92590	0.21	1.08
Luxembourg	522489	628634	16208	106145	0.20	622255	0.03	1.06
Malawi	4235	3778	16208	-457	-0.11	16208	3.83	-0.04
Malaysia	75870	76949	16208	1079	0.01	88820	0.21	0.08
Mali	12017	10173	16208	-1844	-0.15	16208	1.35	-0.44
Mexico	70672	80296	16208	9624	0.14	82735	0.23	0.80
Moldova	15114	15012	16208	-102	-0.01	18096	1.07	-0.03
Mongolia	96860	83183	16208	-13677	-0.14	115968	0.17	-0.72
Morocco	28235	31915	16208	3680	0.13	33805	0.57	0.66
Mozambique	14931	12141	16208	-2790	-0.19	17480	1.09	-1.09
Namibia	89248	89611	16208	363	0.00	106855	0.18	0.02
Nepal	6275	5847	16208	-428	-0.07	16208	2.58	-0.04
Netherlands	371625	411715	16208	40090	0.11	442584	0.04	0.56
New Zealand	262041	280407	16208	18366	0.07	312076	0.06	0.37
Nicaragua	18033	17482	16208	-551	-0.03	21591	0.90	-0.15
Norway	616885	651018	16208	34133	0.06	734675	0.03	0.29
Pakistan	9748	10679	16208	931	0.10	16208	1.66	0.14
Panama	57048	61880	16208	4832	0.08	66785	0.28	0.50
Paraguay	41683	38083	16208	-3600	-0.09	49906	0.39	-0.44
Peru	73015	71347	16208	-1668	-0.02	85478	0.22	-0.13
Philippines	13551	14265	16208	714	0.05	16224	1.20	0.27
Poland	97015	108293	16208	11278	0.12	115539	0.17	0.61
Portugal	253573	272793	16208	19220	0.08	301991	0.06	0.40
Russian Federation	133116	136156	16208	3040	0.02	155837	0.12	0.13
Senegal	13601	12719	16208	-882	-0.06	16208	1.19	-0.34
Singapore	225926	269065	16208	43139	0.19	269065	0.07	1.00
Slovak Republic	107098	121985	16208	14887	0.14	127548	0.15	0.73
Slovenia	217225	243936	16208	26711	0.12	258703	0.07	0.64
South Africa	69879	72379	16208	2500	0.04	83665	0.23	0.18
Spain	304230	348852	16208	44622	0.15	362321	0.05	0.77
Sri Lanka	19699	21232	16208	1533	0.08	23061	0.82	0.46
Sweden	422092	462462	16208	40370	0.10	502688	0.04	0.50
Switzerland	560840	606921	16208	46081	0.08	667929	0.03	0.43
Tajikistan	4928	4627	16208	-301	-0.06	16208	3.29	-0.03
Thailand	29303	32190	16208	2887	0.10	34305	0.55	0.58
Togo	9667	9493	16208	-174	-0.02	16208	1.68	-0.03
Tunisia	39533	44559	16208	5026	0.13	46281	0.41	0.74
Turkey	68709	75600	16208	6891	0.10	80437	0.24	0.59
Uganda	3359	3475	16208	116	0.03	16208	4.83	0.01
Ukraine	40063	42085	16208	2022	0.05	46901	0.40	0.30
United Kingdom	365287	409074	16208	43787	0.12	435036	0.04	0.63
United States	429142	463375	16208	34233	0.08	511084	0.04	0.42
Uruguay	78394	84557	16208	6163	0.08	91775	0.21	0.46
Venezuela, RB	150749	139499	16208	-11250	-0.07	176480	0.11	-0.44
Vietnam	7792	9809	16208	2017	0.26	16208	2.08	0.24
Yemen, Rep.	15850	15599	16208	-251	-0.02	18555	1.02	-0.09
Zambia	39446	31944	16208	-7502	-0.19	46179	0.41	-1.11
Zimbabwe	12612	11965	16208	-647	-0.05	16208	1.29	-0.18

Source: Authors' calculations. Same as PAGE (2017b).

Inclusive Wealth Index – Natural Capital (millions of constant 2005 US\$/capita)

Country	Current sustainability			Progress of sustainability				
	2000-2004 average value of IWI natural capital = y^0	2010-2014 average value of IWI natural capital = y^1	threshold = t	change = $y^1 - y^0$	rate of change = $(y^1 - y^0)/y^0$	target = y^*	Weight $\hat{\pi}$	progress on IWI natural capital
Albania	9906	9523	2277	-383	-0.04	10175	0.23	-1.42
Algeria	15352	11672	2277	-3681	-0.24	15527	0.15	-21.05
Argentina	17612	16170	2277	-1443	-0.08	18477	0.13	-1.67
Armenia	800	702	2277	-99	-0.12	2277	2.85	-0.07
Australia	152745	131113	2277	-21633	-0.14	160243	0.01	-2.88
Austria	7797	7433	2277	-364	-0.05	8180	0.29	-0.95
Bangladesh	294	257	2277	-38	-0.13	2277	7.74	-0.02
Belgium	437	469	2277	32	0.07	2277	5.21	0.02
Benin	4945	3645	2277	-1301	-0.26	5001	0.46	-23.09
Bolivia	108645	91497	2277	-17148	-0.16	109882	0.02	-13.86
Botswana	35606	30204	2277	-5403	-0.15	36011	0.06	-13.32
Brazil	27686	24367	2277	-3320	-0.12	28438	0.08	-4.42
Bulgaria	8505	8955	2277	450	0.05	8736	0.27	1.95
Cambodia	7272	6267	2277	-1006	-0.14	7355	0.31	-12.14
Cameroon	14228	11144	2277	-3084	-0.22	14390	0.16	-19.03
Canada	148679	132787	2277	-15892	-0.11	155978	0.02	-2.18
Chile	16803	15267	2277	-1536	-0.09	17628	0.14	-1.86
China	5882	5245	2277	-637	-0.11	6042	0.39	-3.99
Colombia	28393	24207	2277	-4186	-0.15	29164	0.08	-5.43
Costa Rica	8066	7233	2277	-833	-0.10	8285	0.28	-3.80
Cote d'Ivoire	4370	3837	2277	-534	-0.12	4420	0.52	-10.72
Croatia	4766	5023	2277	257	0.05	5000	0.48	1.10
Cyprus	1413	1270	2277	-143	-0.10	2277	1.61	-0.17
Czech Republic	2270	1598	2277	-673	-0.30	2381	1.00	-6.03
Denmark	6425	4228	2277	-2197	-0.34	6740	0.35	-6.97
Dominican Republic	3474	3062	2277	-412	-0.12	3514	0.66	-10.41
Ecuador	15751	12090	2277	-3662	-0.23	16179	0.14	-8.56
Egypt, Arab Rep.	1642	1121	2277	-521	-0.32	2277	1.39	-0.82
El Salvador	1315	1269	2277	-46	-0.03	2277	1.73	-0.05
Estonia	13600	13755	2277	155	0.01	14268	0.17	0.23
Finland	32583	30732	2277	-1851	-0.06	34183	0.07	-1.16
France	4579	4477	2277	-102	-0.02	4804	0.50	-0.45
Germany	18226	17496	2277	-731	-0.04	19121	0.12	-0.82
Ghana	3051	2356	2277	-696	-0.23	3086	0.75	-20.02
Greece	19256	14855	2277	-4402	-0.23	20201	0.12	-4.66
Guatemala	2814	2071	2277	-744	-0.26	2846	0.81	-23.20
Honduras	11095	8489	2277	-2607	-0.23	11221	0.21	-20.63
Hungary	4354	4152	2277	-203	-0.05	4568	0.52	-0.95
Iceland	270754	227975	2277	-42780	-0.16	284046	0.01	-3.22
India	2284	1959	2277	-326	-0.14	2310	1.00	-12.51
Indonesia	8784	7538	2277	-1246	-0.14	8884	0.26	-12.46
Ireland	8111	7092	2277	-1019	-0.13	8509	0.28	-2.56
Israel	1073	838	2277	-236	-0.22	2277	2.12	-0.20
Italy	5829	5635	2277	-195	-0.03	6115	0.39	-0.68
Jamaica	11606	10590	2277	-1017	-0.09	11921	0.20	-3.23
Japan	3171	3027	2277	-145	-0.05	3327	0.72	-0.93
Jordan	1571	1263	2277	-309	-0.20	2277	1.45	-0.44
Kazakhstan	57481	52727	2277	-4754	-0.08	59042	0.04	-3.05
Kenya	1288	1047	2277	-241	-0.19	2277	1.77	-0.24

Korea, Rep.	7977	8321	2277	344	0.04	8369	0.29	0.88
Kyrgyz Republic	2843	2932	2277	89	0.03	2875	0.80	2.75
Latvia	8476	9674	2277	1198	0.14	8706	0.27	5.21
Lithuania	4258	4552	2277	294	0.07	4467	0.53	1.41
Luxembourg	2837	2569	2277	-269	-0.09	2976	0.80	-1.93
Malawi	1983	1552	2277	-431	-0.22	2277	1.15	-1.47
Malaysia	17018	12847	2277	-4171	-0.25	17480	0.13	-9.03
Mali	6926	5299	2277	-1627	-0.23	7005	0.33	-20.63
Mexico	9248	7711	2277	-1538	-0.17	9499	0.25	-6.12
Moldova	972	1203	2277	231	0.24	2277	2.34	0.18
Mongolia	85207	71263	2277	-13944	-0.16	86177	0.03	-14.37
Morocco	1893	1734	2277	-159	-0.08	2277	1.20	-0.41
Mozambique	12352	9932	2277	-2420	-0.20	12493	0.18	-17.20
Namibia	31823	26640	2277	-5183	-0.16	32185	0.07	-14.30
Nepal	3618	2906	2277	-712	-0.20	3659	0.63	-17.28
Netherlands	5958	4502	2277	-1456	-0.24	6250	0.38	-4.98
New Zealand	41964	31387	2277	-10577	-0.25	44024	0.05	-5.13
Nicaragua	6740	5558	2277	-1183	-0.18	6817	0.34	-15.41
Norway	72513	48785	2277	-23728	-0.33	76073	0.03	-6.67
Pakistan	1298	1032	2277	-267	-0.21	2277	1.75	-0.27
Panama	12378	10606	2277	-1772	-0.14	12714	0.18	-5.27
Paraguay	24108	19845	2277	-4264	-0.18	24383	0.09	-15.53
Peru	44342	39782	2277	-4560	-0.10	45546	0.05	-3.79
Philippines	1413	1264	2277	-150	-0.11	2277	1.61	-0.17
Poland	4611	3880	2277	-731	-0.16	4837	0.49	-3.23
Portugal	3011	2860	2277	-152	-0.05	3159	0.76	-1.02
Russian Federation	69466	68345	2277	-1122	-0.02	71352	0.03	-0.59
Senegal	6188	4846	2277	-1342	-0.22	6258	0.37	-19.04
Singapore	9	8	2277	-2	-0.17	2277	253.00	0.00
Slovak Republic	2897	2881	2277	-17	-0.01	3039	0.79	-0.12
Slovenia	10137	10668	2277	531	0.05	10635	0.22	1.07
South Africa	14586	12614	2277	-1973	-0.14	14752	0.16	-11.88
Spain	5634	4949	2277	-686	-0.12	5911	0.40	-2.48
Sri Lanka	1065	993	2277	-72	-0.07	2277	2.14	-0.06
Sweden	23157	23421	2277	264	0.01	24294	0.10	0.23
Switzerland	11354	10808	2277	-547	-0.05	11911	0.20	-0.98
Tajikistan	983	908	2277	-75	-0.08	2277	2.32	-0.06
Thailand	1392	890	2277	-503	-0.36	2277	1.64	-0.57
Togo	35913	25513	2277	-10401	-0.29	36322	0.06	-25.43
Tunisia	5156	4408	2277	-749	-0.15	5296	0.44	-5.35
Turkey	666	438	2277	-229	-0.34	2277	3.42	-0.14
Uganda	13738	14265	2277	527	0.04	13894	0.17	3.37
Ukraine	321240	173220	2277	-148020	-0.46	329962	0.01	-16.97
United Kingdom	5047	3800	2277	-1248	-0.25	5295	0.45	-5.04
United States	31570	28699	2277	-2872	-0.09	33120	0.07	-1.85
Uruguay	11143	10808	2277	-335	-0.03	11446	0.20	-1.11
Venezuela, RB	75291	62454	2277	-12837	-0.17	77335	0.03	-6.28
Vietnam	1652	1510	2277	-142	-0.09	2277	1.38	-0.23
Yemen, Rep.	3516	2459	2277	-1058	-0.30	3556	0.65	-26.41
Zambia	34271	27976	2277	-6296	-0.18	34661	0.07	-16.13
Zimbabwe	6938	6058	2277	-881	-0.13	7017	0.33	-11.14

Source: Authors' calculations. Same as PAGE (2017b).

Table All.2 shows that, **on average, countries are experiencing regress in most of the dashboard indicators. In other words, countries are on average exceeding planetary boundaries.** The only indicators for which the majority of countries are making progress are freshwater withdrawal (with almost no progress on average) and the Inclusive Wealth Index, with an average progress of 0.31. One striking result presented in Table All.2 below is that, across all indicators, some countries are experiencing significant regress (progress lower than -1).

Table All.2: Summary of dashboard indicators (sample of countries with GEP Index)

<i>Indicator</i>	<i>Obs.</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Freshwater withdrawal	85	0.05	1.25	-8.45	2.03
Greenhouse gas emissions	110	-0.25	0.67	-3.24	1.38
Emissions of nitrogen	103	-0.26	1.31	-6.37	1.44
Land use	109	-0.44	1.14	-5.07	1.74
Inclusive Wealth Index	100	0.31	0.52	-1.11	1.84
Inclusive Wealth Index (Natural Capital)	100	-5.84	7.48	-26.41	5.21

Source: Author's calculations.

Table All.3 shows that only 44 out of 110 countries (40 per cent) are making progress with respect to greenhouse gas emissions. Similarly, for land use, only 41 (38 per cent) out of 109 countries are making progress. The only two indicators for which the number of countries making progress is greater than those making regress are the Inclusive Wealth Index and freshwater withdrawal. However, results show that the majority of counties are regressing in the natural capital component of the Inclusive Wealth Index⁵¹. This regress is consistent with the negative average value in Table All.2 and with the regress found for the other dashboard indicators.

Table All.3: Number of countries making progress/regress in dashboard indicators

<i>Indicator</i>	<i>Obs.</i>	<i>Progress</i>	<i>Regress</i>
Freshwater withdrawal	85	61	24
Greenhouse gas emissions	110	44	66
Emissions of nitrogen	103	59	44
Land use	109	41	68
Inclusive Wealth Index	100	72	18
Inclusive Wealth Index (Natural Capital)	100	12	88

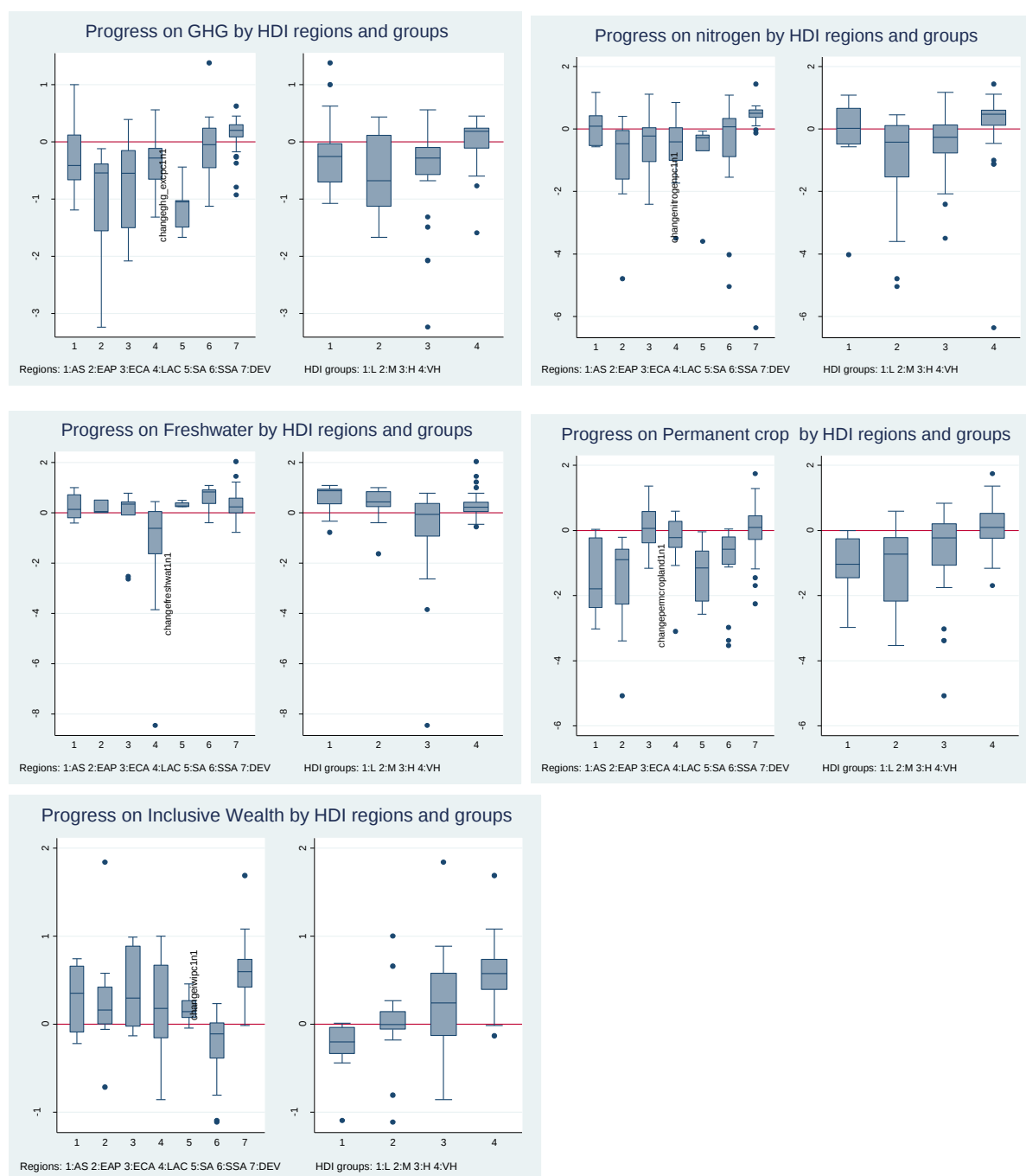
Source: Author's calculations.

Figure All.1 below shows the progress made on the dashboard indicators by HDI group and region. Results show major heterogeneities between regions and across indicators. As can be seen in this figure, for greenhouse gas emissions most of the progress made is concentrated in very highly developed countries, while the worst performance is concentrated in East Asia and the Pacific and Europe and Central Asia. Other patterns of heterogeneity can be observed for some indicators, such as the Inclusive Wealth Index, where most of the regions experienced progress, while sub-Saharan African countries experienced regress.

In terms of development, there are also differences across HDI groups. Most countries in the different HDI groups experienced progress in freshwater withdrawal (reducing freshwater withdrawal), although results were more mixed for countries in the High HDI group. However, the majority of countries across HDI groups experienced regress in their GHG emissions per capita and their share of land used for permanent crops, with most of the progress was achieved in the very high HDI group, while regress in these indicators was mostly seen in the medium and low HDI groups (and there are mixed results for the high HDI group).

⁵¹ The IWI combines manufactured capital, human capital and natural capital, the latter of which is described in terms of sub-soil resources, ecosystems, and the atmosphere (UNU-IHDP/UNEP, 2014).

Figure AII.1: Progress on dashboard indicators by regions and HDI groups



Source: Author's calculations.

Note: The four categories of human development achievement used in the Figure are obtained using the cut-offs: 0.800 for Very High, 0.700 for High, and 0.550 for Medium⁵².

⁵² The regions in Figure AII.1 are: 1) Middle East and North Africa; 2) East Asia and the Pacific; 3) Europe and Central Asia; 4) Latin America and the Caribbean; 5) South Asia; 6) Sub-Saharan Africa; and 7) All countries with HDI very high (HDI>0.8) that do not belong to any of these regions (UNDP, 2020).

B. Ranking of GEP Index-dashboard profiles using the Protective Criterion (GEP+), 102 countries by HDI group using PAGE (2017b)⁵³

As discussed in PAGE (2017a), the Protective Criterion can be used to produce a ranking of all GEP Index-dashboard profiles, but not to combine the GEP Index and dashboard information into a synthetic index. Similar to PAGE(2017b), due to sample restrictions, only the results for greenhouse gas emissions, nitrogen emissions and the share of land used as permanent crops, will be presented in this section as they make it possible to have a sample of 102 countries for the time period chosen (2004 – 2019)⁵⁴.

Rank	Country	Progress Greenhouse gas emissions	Progress Nitrogen emissions	Progress Land use	GEP Index	Worst performance (for Protective criterion)	HDI group
1	Cyprus	0.9419	0.5814	0.2251	0.2498	0.2251	Very High
2	Italy	1.5296	3.3798	0.1055	0.3382	0.1055	Very High
3	Czech Republic	1.3149	2.7508	0.0575	0.2473	0.0575	Very High
4	Spain	1.4947	3.9265	0.0440	0.3772	0.0440	Very High
5	Slovak Republic	1.0318	1.8297	0.0407	0.1988	0.0407	Very High
6	Hungary	0.8111	1.5423	0.0356	0.4468	0.0356	Very High
7	France	1.2848	3.3168	0.0355	0.2892	0.0355	Very High
8	Portugal	0.7679	2.7722	0.0281	0.3960	0.0281	Very High
9	Canada	1.3456	8.1586	0.0278	0.1535	0.0278	Very High
10	Singapore	1.0757	0.4117	0.0177	0.1035	0.0177	Very High
11	Greece	1.7667	3.6011	0.0166	0.3943	0.0166	Very High
12	Denmark	2.8531	5.0131	0.0153	0.3383	0.0153	Very High
13	Austria	1.0375	2.2753	0.0065	0.1250	0.0065	Very High
14	Germany	0.8752	1.6402	0.0021	0.2837	0.0021	Very High
15	Ireland	2.6838	4.5888	0.0021	3.3834	0.0021	Very High
16	United States	2.7454	8.2868	0.0017	0.3296	0.0017	Very High
17	United Kingdom	2.5180	4.3658	0.0014	1.1192	0.0014	Very High
18	Norway	1.0034	3.5816	0.0008	0.1232	0.0008	Very High
19	Finland	2.7430	5.0162	0.0004	0.2329	0.0004	Very High
20	Sweden	1.6968	2.3377	-0.0006	0.2359	-0.0006	Very High
21	Switzerland	1.0633	1.6323	-0.0046	0.0515	-0.0046	Very High
22	Belgium	1.9390	3.9688	-0.0082	0.6567	-0.0082	Very High
23	Croatia	0.5871	3.7294	-0.0094	0.2241	-0.0094	Very High
24	New Zealand	1.6775	0.7934	-0.0101	0.1850	-0.0101	Very High
25	Netherlands	1.1129	2.9564	-0.0230	0.4622	-0.0230	Very High
26	Poland	-0.0169	0.4756	-0.0269	0.2095	-0.0269	Very High
27	Luxembourg	3.7405	12.5278	-0.0318	0.1526	-0.0318	Very High
28	Japan	-0.0380	1.5492	0.0217	0.2300	-0.0380	Very High
29	Israel	0.5035	5.0626	-0.0981	0.2220	-0.0981	Very High
30	Slovenia	0.8841	2.9492	-0.1679	0.5341	-0.1679	Very High
31	Estonia	-0.4859	2.1659	0.0432	0.1593	-0.4859	Very High

⁵³ Values used for the GEP index and progress on dashboard indicators are calculated as indicated in Sections 3.2 and 4.4, respectively.

⁵⁴ Freshwater withdrawal reduces the sample size to 74 countries.

32	Lithuania	-0.5158	-0.4704	0.0138	0.0052	-0.5158	Very High
33	Australia	3.4414	-0.5919	-0.0001	0.0877	-0.5919	Very High
34	Costa Rica	-0.7294	0.0988	-0.0843	0.0310	-0.7294	Very High
35	Latvia	-0.8964	0.4780	0.0129	-0.1703	-0.8964	Very High
36	Chile	-1.1599	1.8404	-0.0095	0.2114	-1.1599	Very High
37	Turkey	-1.2831	2.5585	-0.1551	-0.1509	-1.2831	Very High
38	Panama	-1.3570	-0.4586	-0.0639	0.2041	-1.3570	Very High
39	Korea, Rep.	-1.4736	0.7140	-0.0371	0.6236	-1.4736	Very High
40	Argentina	-0.5187	-1.4991	0.0000	0.1755	-1.4991	Very High
41	Bulgaria	-0.1578	-1.7996	0.1437	0.5510	-1.7996	Very High
42	Georgia	-2.3806	0.7987	0.3051	-0.1377	-2.3806	Very High
43	Kazakhstan	-3.0988	-0.0506	-0.0004	0.0300	-3.0988	Very High
44	Uruguay	-0.5578	-3.5380	0.0026	-0.2042	-3.5380	Very High
45	Malaysia	-1.3982	-4.3537	-0.8548	0.0649	-4.3537	Very High
46	Russian Federation	-0.7228	-6.8665	0.0025	0.0173	-6.8665	Very High
47	Belarus	-0.6058	-6.8974	0.0080	0.3787	-6.8974	Very High
1	Jamaica	1.2491	0.5980	0.2384	0.2792	0.2384	High
2	Venezuela, RB	0.1535	0.4434	0.0117	0.1772	0.0117	High
3	Jordan	0.2351	2.5587	0.0023	0.1905	0.0023	High
4	South Africa	-0.2056	0.6865	-0.0037	0.0742	-0.2056	High
5	Dominican Republic	-0.4003	-0.2449	0.2829	0.1872	-0.4003	High
6	Moldova	-0.4392	-0.4146	0.1959	0.4066	-0.4392	High
7	Philippines	-0.3611	0.3787	-0.4583	2.7011	-0.4583	High
8	Tunisia	-0.4859	-0.5052	-0.2145	0.1462	-0.5052	High
9	Ecuador	-0.5605	-0.5231	-0.1342	0.0746	-0.5605	High
10	Indonesia	-0.1875	-0.7497	-0.7045	0.0384	-0.7497	High
11	Azerbaijan	-0.7528	0.0022	-0.0234	-0.1274	-0.7528	High
12	Albania	-0.7872	0.1265	0.2444	0.0087	-0.7872	High
13	Sri Lanka	-0.8655	-0.1128	-0.0439	0.1106	-0.8655	High
14	Egypt, Arab Rep.	-0.9187	0.4877	-0.1000	0.0880	-0.9187	High
15	Algeria	-1.0789	0.0189	-0.0326	0.3263	-1.0789	High
16	Macedonia, FYR	-0.2745	-1.1859	0.0681	0.1205	-1.1859	High
17	Bolivia	-1.2833	-0.4787	-0.0103	0.1358	-1.2833	High
18	Colombia	-0.4926	-1.3310	-0.0503	0.2029	-1.3310	High
19	Brazil	-0.5480	-1.4431	0.0164	0.0423	-1.4431	High
20	Peru	-1.5298	-0.1338	-0.0547	0.2295	-1.5298	High
21	Thailand	-1.2573	-1.6503	-0.3410	0.2832	-1.6503	High
22	Paraguay	-0.8282	-2.4408	0.0066	0.4703	-2.4408	High
23	Mexico	-0.1011	-2.6247	-0.0189	0.3027	-2.6247	High
24	Mongolia	-2.7769	-0.7994	-0.0004	-0.3597	-2.7769	High
25	Vietnam	-3.0457	1.3180	-1.6510	-0.4065	-3.0457	High
26	Ukraine	1.7903	-3.8496	0.0064	0.1261	-3.8496	High
27	China	-4.3153	-2.0279	-0.0851	-0.1190	-4.3153	High
1	Zimbabwe	0.4274	0.2028	0.0000	0.2458	0.0000	Medium
2	Angola	0.1927	-0.0448	0.0007	0.1919	-0.0448	Medium
3	Cameroon	1.0965	0.0654	-0.1622	0.2280	-0.1622	Medium

4	Namibia	0.4008	-0.2960	-0.0013	0.3261	-0.2960	Medium
5	Honduras	-0.3753	0.7063	-0.1757	0.3103	-0.3753	Medium
6	Bangladesh	-0.4653	-0.2828	-0.5613	0.1817	-0.5613	Medium
7	Kenya	-0.5644	0.0424	-0.0372	2.6713	-0.5644	Medium
8	Ghana	-0.6139	-0.3078	-0.3766	0.1362	-0.6139	Medium
9	Nepal	-0.6541	-0.3494	-0.1441	0.3300	-0.6541	Medium
10	Zambia	0.3255	-0.7609	-0.0007	0.4963	-0.7609	Medium
11	Tajikistan	-0.8129	-0.8425	-0.0553	0.3148	-0.8425	Medium
12	Nicaragua	-0.8751	-0.5531	-0.0487	0.2790	-0.8751	Medium
13	Pakistan	-0.3536	-0.9066	-0.0371	0.2009	-0.9066	Medium
14	Cambodia	-0.9077	-0.5048	-0.0115	1.0878	-0.9077	Medium
15	Morocco	-1.1653	0.6518	-0.3039	0.0086	-1.1653	Medium
16	Guatemala	-0.6009	-0.6228	-1.1906	0.3043	-1.1906	Medium
17	India	-1.3554	-1.4319	-0.2501	0.3650	-1.4319	Medium
18	Kyrgyz Republic	-1.5628	0.0277	-0.0093	0.0200	-1.5628	Medium
19	El Salvador	-0.0895	-2.2513	0.4789	0.2706	-2.2513	Medium
1	Senegal	-0.0513	0.0080	-0.0199	0.1647	-0.0513	Low
2	Yemen, Rep.	0.6771	-0.0655	-0.0445	0.4179	-0.0655	Low
3	Togo	-0.1609	0.2112	-0.1658	0.3522	-0.1658	Low
4	Mali	-0.1754	1.7384	-0.0016	0.4370	-0.1754	Low
5	Malawi	-0.1859	-0.1055	-0.0239	0.4219	-0.1859	Low
6	Mozambique	-0.0211	-0.3153	-0.0143	0.2264	-0.3153	Low
7	Cote d'Ivoire	1.1920	0.1103	-0.4680	0.0998	-0.4680	Low
8	Benin	-0.4102	0.2245	-0.4684	-0.0346	-0.4684	Low
9	Uganda	-0.5380	-0.0144	-0.0702	0.8551	-0.5380	Low

Source: Authors' calculations.

Note: Observations in bold indicate the minimum among all indicators. The ranking presented in this table is based on the following four categories: (a) the GEP Index; (b) greenhouse gas emissions; (c) nitrogen emissions; and (d) the share of land used as permanent crops. If the categories considered change, the ranking would vary as well. Note that each dashboard indicator is multiplied by its weight, while the GEP Index is multiplied by the average of the weights (see PAGE (2017a)).

Results from the GEP Index and the three dashboard sustainability indicators show that only 19 countries in our sample were able to achieve positive progress (or no regress) in all the Dashboard of Sustainability indicators as well as a positive GEP Index score.⁵⁵ Comparison across countries however, seems to be more valid, when we concentrate the comparison among similar countries. previous table presented the results for countries per HDI group, showing how the Protective Criterion works in determining the ranking within each HDI group^{56,57}. In the case of the Very High HDI group, all four top countries have all indicators with progress; Cyprus has the highest rank because its smallest progress in land use is higher than the lowest of any other country in this group. In the case of the High HDI group, three out of four countries have made progress in all indicators. For this group, Jamaica is the country with the highest ranking. For the Medium HDI group, there is no country with progress in all indicators, but Zimbabwe is the country with the highest ranking because it is the only country in this group

⁵⁵ These are 2 more countries than in the results presented on PAGE(2017b).

⁵⁶ The sample of 102 countries is distributed across HDI groups as follows: 34 Very High, 27 High, 21 Medium, and 18 Low.

⁵⁷ Remember the values use to calculate the GEP+ are the GEP index multiplied by the average of $\hat{\pi}_j$ across its indicators and a set of weighted progress of the dashboard $\langle \frac{dK_1}{dK_1^*} \hat{\pi}_1, \dots, \frac{dK_J}{dK_J^*} \hat{\pi}_J \rangle$, see more PAGE (2017a).

with all indicators with positive or zero progress. Finally, for the Low HDI group, Senegal is the top ranked country because its regress on greenhouse gas emissions is the smallest regress in all indicators that experience regress for countries in this group. The rest of countries in this group have experienced regress in at least some indicator.

ANNEX III - GEP+ incorporating footprint indicators, Alternative Option: Production and consumption separately, applying Protective criterion per indicator

This alternative option of incorporating the footprint indicators to the GEP+ prevents any substitutability across supply side and footprint indicators. For this, it applies the Protective criterion first within each indicator so that the progress of that particular indicator will be the worst between either its production-based or consumption-based (footprint) version. Given the higher data availability for the footprint indicators, we are able to have a sample of 108 countries for the time period chosen (2004 – 2019). Consistent with the results presented on section 3.2.1, indicating more regress when focusing on footprint indicators, applying the Protective Criterion for GHG emissions lead to the carbon footprint indicator to be selected as the worst performance 64.8% (for 70 out of the 108 countries); the water stress footprint indicator was selected as the worst performance 79.6% (for 86 out of the 108 countries); while the land-use related biodiversity loss footprint indicator was selected as the worst performance 51.8% (for 56 out of the 108 countries).

Table AIII.A1 presents the results from the GEP Index and the three dashboard sustainability indicators using the alternative option (applying protective criterion within each indicator) showing that 17 countries in our sample of 108 (15.7%) were able to achieve positive progress (or no regress) in all the Dashboard of Sustainability indicators as well as a positive GEP Index score.⁵⁸ In the case of the Very High HDI group, all four top countries have all indicators with progress; the United States has the highest rank because its smallest progress in the GEP index, but it is higher than the lowest of any other country in this group. In the case of the High HDI group, none of the countries have made progress in all indicators. For this group, Jamaica is the country with the highest ranking, having its lowest performance in water stress. For the Medium HDI group, Zimbabwe is the country with the highest ranking because it is the only country in this group with all indicators with progress. Finally, for the Low HDI group, the Gambia is the top ranked country because its regress on greenhouse gas emissions is the smallest regress in all indicators that experience regress for countries in this group. The rest of countries in this group have experienced regress in at least some indicator. When considering the entire sample of 108 countries, the incorporation of footprint indicators increases the role of GHG emissions as a driver of the final ranking. For 62.9% of countries (68 out of 108) experienced their worst performance in GHG emissions, 22.2% experienced their worst performance in water stress (24 out of 108), 13.8% on land use related biodiversity loss (15 out of 108), and 1% on the GEP index (the US).⁵⁹

⁵⁸ This represents two less countries than in the results presented on section 2.2.4.

⁵⁹ For the results presented on section 2.2.4, For 36% of countries (37 out of 102) experienced their worst performance in GHG emissions, 25% experienced their worst performance in nitrogen emissions, 39% on land use, and 0% on the GEP index.

Table AIII.A1: Rank GEP Index-dashboard profiles using the Protective Criterion for GEP+, Alternative Option (Top 4 countries per HDI group)

Rank	Country	Progress Greenhouse gas emissions	Progress Water stress	Progress Land use related biodiversity loss	GEP Index	Worst performance (for Protective criterion)	HDI group
1	Portugal	0.7679	1.0518	0.1720	0.3960	0.1720	Very High
2	Spain	1.4947	1.8296	0.1590	0.3772	0.1590	Very High
3	United States	2.7454	0.8040	0.1441	0.3296	0.1441	Very High
4	Italy	1.5296	0.6854	0.1229	0.3382	0.1229	Very High
1	Jordan	0.2351	1.1106	0.0225	0.1905	0.0225	High
2	Venezuela, RB	0.1535	-0.0714	0.3465	0.1772	-0.0714	High
3	Mexico	-0.1011	0.2657	0.3531	0.3027	-0.1011	High
4	Jamaica	0.7571	-0.1138	0.0367	0.2792	-0.1138	High
1	Zimbabwe	0.4274	0.0919	0.1563	0.2458	0.0919	Medium
2	Cameroon	1.0965	0.0215	0.2427	0.2280	0.0215	Medium
3	Zambia	0.3255	0.0024	0.1593	0.4963	0.0024	Medium
4	Angola	0.1927	-0.0659	0.3071	0.1919	-0.0659	Medium
1	Cote d'Ivoire	0.2237	0.0234	0.1834	0.0998	0.0234	Low
2	Gambia, The	-0.0116	0.0076	0.0281	0.4350	-0.0116	Low
3	Malawi	-0.1859	0.0143	0.0603	0.4219	-0.1859	Low
4	Togo	-0.2477	0.0027	0.0589	0.3522	-0.2477	Low

Source: Author's calculations.

Note: Observations in bold indicate the minimum value among all categories. The ranking presented in this table is based on the following four categories: (a) the GEP Index; (b) greenhouse gas emissions; (c) water stress; and (d) land used related biodiversity loss. If the categories considered change, the ranking would vary as well. Note that each dashboard indicator is multiplied by its weight, while the GEP Index is multiplied by the average of the weights (see PAGE (2017b)).

A. Ranking of GEP Index-dashboard profiles using the Protective Criterion (GEP+) Alternative Option, 108 countries by HDI group⁶⁰

Rank	Country	Progress Greenhouse gas emissions	Progress Water stress	Progress Land Use related biodiversity loss	GEP Index	Worst performance (for Protective criterion)	HDI group
1	Portugal	0.7679	1.0518	0.1720	0.3960	0.1720	Very High
2	Spain	1.4947	1.8296	0.1590	0.3772	0.1590	Very High
3	United States	2.7454	0.8040	0.1441	0.3296	0.1441	Very High
4	Italy	1.5296	0.6854	0.1229	0.3382	0.1229	Very High
5	Cyprus	0.9419	2.0276	0.1097	0.2498	0.1097	Very High
6	Australia	0.7824	0.7716	2.2831	0.0877	0.0877	Very High
7	France	1.2848	0.0846	0.0675	0.2892	0.0675	Very High
8	Israel	0.5035	1.2974	0.0515	0.2220	0.0515	Very High
9	Croatia	0.0735	0.0483	0.3512	0.2241	0.0483	Very High
10	Hungary	0.8111	0.0087	0.0100	0.4468	0.0087	Very High
11	Austria	1.0375	0.0083	0.0671	0.1250	0.0083	Very High
12	Denmark	2.3199	0.0385	0.0003	0.3383	0.0003	Very High
13	United Kingdom	2.5180	0.0174	-0.0111	1.1192	-0.0111	Very High
14	Switzerland	0.9372	-0.0161	0.0275	0.0515	-0.0161	Very High
15	Netherlands	1.1129	-0.0053	-0.0242	0.4622	-0.0242	Very High
16	Ireland	2.3816	0.0062	-0.0256	3.3834	-0.0256	Very High
17	Japan	-0.0380	0.0061	-0.0292	0.2300	-0.0380	Very High
18	Finland	2.4241	-0.0602	-0.0117	0.2329	-0.0602	Very High
19	Canada	-0.0637	-0.1142	0.0204	0.1535	-0.1142	Very High
20	Greece	1.7667	2.3151	-0.2200	0.3943	-0.2200	Very High
21	Norway	-0.2290	0.0105	0.0107	0.1232	-0.2290	Very High
22	Romania	-0.2003	-0.2352	0.0054	-0.0270	-0.2352	Very High
23	New Zealand	0.9794	-0.2474	1.8442	0.1850	-0.2474	Very High
24	Belgium	1.8303	-0.2617	0.0269	0.6567	-0.2617	Very High
25	Slovak Republic	0.2532	-0.2846	0.0235	0.1988	-0.2846	Very High
26	Bulgaria	-0.3692	-0.2148	0.0702	0.5510	-0.3692	Very High
27	Poland	-0.3914	-0.3115	0.0521	0.2095	-0.3914	Very High
28	Czech Republic	1.0178	-0.4066	-0.0149	0.2473	-0.4066	Very High
29	Sweden	1.0550	-0.4300	0.0435	0.2359	-0.4300	Very High
30	Germany	0.8752	-0.4377	-0.0213	0.2837	-0.4377	Very High
31	Argentina	-0.5187	-0.0839	0.0231	0.1755	-0.5187	Very High
32	Belarus	-0.6058	-0.1643	0.0099	0.3787	-0.6058	Very High
33	Slovenia	0.8630	-0.8199	0.0341	0.5341	-0.8199	Very High
34	Costa Rica	-0.9555	-0.1750	0.1284	0.0310	-0.9555	Very High
35	Estonia	-0.4859	-0.9987	-0.2148	0.1593	-0.9987	Very High
36	Lithuania	-1.1907	-1.2330	-0.0734	0.0052	-1.2330	Very High
37	Panama	-1.3570	-0.1781	0.2443	0.2041	-1.3570	Very High

⁶⁰ Values used for the GEP index and progress on dashboard indicators are calculated as indicated in Section 3.2 and this annex, respectively.

38	Luxembourg	2.1609	-0.7848	-1.3689	0.1526	-1.3689	Very High
39	Latvia	-1.4044	-0.5102	-0.1551	-0.1703	-1.4044	Very High
40	Korea, Rep.	-1.4736	-0.0065	0.0031	0.6236	-1.4736	Very High
41	Turkey	-1.5184	0.2485	0.4931	-0.1509	-1.5184	Very High
42	Chile	-1.5304	-0.2985	-0.1315	0.2114	-1.5304	Very High
43	Malaysia	-1.6308	-0.3170	0.2197	0.0649	-1.6308	Very High
44	Uruguay	-1.8652	-0.2629	-0.2935	-0.2042	-1.8652	Very High
45	Russian Federation	-1.9883	-0.4863	0.0037	0.0173	-1.9883	Very High
46	Georgia	-2.5926	-0.3175	-0.0039	-0.1377	-2.5926	Very High
47	Kazakhstan	-3.1142	-0.1334	-0.0395	0.0300	-3.1142	Very High
48	Singapore	-4.6546	-1.2443	0.0054	0.1035	-4.6546	Very High
1	Jordan	0.2351	1.1106	0.0225	0.1905	0.0225	High
2	Venezuela, RB	0.1535	-0.0714	0.3465	0.1772	-0.0714	High
3	Mexico	-0.1011	0.2657	0.3531	0.3027	-0.1011	High
4	Jamaica	0.7571	-0.1138	0.0367	0.2792	-0.1138	High
5	South Africa	-0.2056	0.3235	1.2589	0.0742	-0.2056	High
6	Ukraine	-0.2165	0.0049	0.0492	0.1261	-0.2165	High
7	Philippines	-0.3611	0.0142	0.8079	2.7011	-0.3611	High
8	Tunisia	-0.4859	-0.4903	0.1166	0.1462	-0.4903	High
9	Botswana	-0.5394	0.2212	0.2427	0.4566	-0.5394	High
10	Dominican Republic	-0.6252	-0.4962	0.6335	0.1872	-0.6252	High
11	Colombia	-0.6847	-0.1749	0.5260	0.2029	-0.6847	High
12	Ecuador	-0.7257	-0.0377	0.5437	0.0746	-0.7257	High
13	Brazil	-0.7315	-0.0649	1.1071	0.0423	-0.7315	High
14	Egypt, Arab Rep.	-0.9187	3.8951	-0.0227	0.0880	-0.9187	High
15	Algeria	-1.1729	0.0007	0.0260	0.3263	-1.1729	High
16	Bolivia	-1.4169	-0.0325	0.9803	0.1358	-1.4169	High
17	Sri Lanka	-1.4800	-0.0249	0.0334	0.1106	-1.4800	High
18	Azerbaijan	-1.5086	-0.8769	-0.2086	-0.1274	-1.5086	High
19	Indonesia	-0.5167	-0.1214	-1.6390	0.0384	-1.6390	High
20	Thailand	-1.7195	-0.0686	0.1181	0.2832	-1.7195	High
21	Moldova	-1.7419	-0.2477	0.0129	0.4066	-1.7419	High
22	Albania	-1.8836	0.0770	0.3381	0.0087	-1.8836	High
23	Peru	-2.1998	-0.0820	0.4378	0.2295	-2.1998	High
24	Paraguay	-2.2741	-0.1088	-0.0166	0.4703	-2.2741	High
25	Vietnam	-3.0457	-0.0284	0.1461	-0.4065	-3.0457	High
26	Armenia	-4.1574	-0.5288	-0.1609	-0.1680	-4.1574	High
27	China	-4.5801	-1.4341	-0.1099	-0.1190	-4.5801	High
28	Mongolia	-4.6156	-0.3179	0.3499	-0.3597	-4.6156	High
1	Zimbabwe	0.4274	0.0919	0.1563	0.2458	0.0919	Medium
2	Cameroon	1.0965	0.0215	0.2427	0.2280	0.0215	Medium
3	Zambia	0.3255	0.0024	0.1593	0.4963	0.0024	Medium
4	Angola	0.1927	-0.0659	0.3071	0.1919	-0.0659	Medium
5	Pakistan	-0.3536	0.8624	0.0069	0.2009	-0.3536	Medium
6	Namibia	-0.3924	0.0645	1.6203	0.3261	-0.3924	Medium

7	El Salvador	-0.5487	-0.1046	0.0555	0.2706	-0.5487	Medium
8	Kenya	-0.6058	-0.5068	0.0946	2.6713	-0.6058	Medium
9	Ghana	-0.6139	-0.0098	0.0886	0.1362	-0.6139	Medium
10	Guatemala	-0.6171	-0.0504	0.1336	0.3043	-0.6171	Medium
11	Bangladesh	-0.6747	-0.0323	0.0446	0.1817	-0.6747	Medium
12	Honduras	-0.7365	-0.0571	0.0738	0.3103	-0.7365	Medium
13	Nicaragua	-0.8751	-0.0297	0.4540	0.2790	-0.8751	Medium
14	Cambodia	-0.9589	-0.0218	0.0657	1.0878	-0.9589	Medium
15	Nepal	-0.9641	0.0007	0.0758	0.3300	-0.9641	Medium
16	Tajikistan	-0.9685	-0.3060	-0.0727	0.3148	-0.9685	Medium
17	India	-1.3554	-0.2800	0.0823	0.3650	-1.3554	Medium
18	Morocco	-2.1064	0.7507	0.0524	0.0086	-2.1064	Medium
19	Kyrgyz Republic	-2.5452	0.1559	0.1205	0.0200	-2.5452	Medium
1	Cote d'Ivoire	0.2237	0.0234	0.1834	0.0998	0.0234	Low
2	Gambia, The	-0.0116	0.0076	0.0281	0.4350	-0.0116	Low
3	Malawi	-0.1859	0.0143	0.0603	0.4219	-0.1859	Low
4	Togo	-0.2477	0.0027	0.0589	0.3522	-0.2477	Low
5	Senegal	-0.3852	-0.1810	0.0446	0.1647	-0.3852	Low
6	Ethiopia	-0.5245	-0.0335	0.0011	2.8972	-0.5245	Low
7	Mozambique	-0.5348	0.0073	0.3460	0.2264	-0.5348	Low
8	Uganda	-0.5738	0.1239	0.0986	0.8551	-0.5738	Low
9	Yemen, Rep.	-0.6255	0.5225	0.0653	0.4179	-0.6255	Low
10	Benin	-0.6667	0.0216	0.0392	-0.0346	-0.6667	Low
11	Tanzania	-0.7485	0.0187	0.2399	1.3581	-0.7485	Low
12	Burkina Faso	-0.8724	-0.0742	-0.0519	0.0609	-0.8724	Low
13	Mali	-0.8932	-0.0701	0.0479	0.4370	-0.8932	Low

Source: Authors' calculations.

Note: Observations in bold indicate the minimum among all indicators. The ranking presented in this table is based on the following four categories: (a) the GEP Index; (b) greenhouse gas emissions; (c) Water stress; and (d) Land Use related biodiversity loss. If the categories considered change, the ranking would vary as well. Note that each dashboard indicator is multiplied by its weight, while the GEP Index is multiplied by the average of the weights (see PAGE (2017a)).

B. Comparing results from GEP+ incorporating footprint indicators of section 4.4.1 with the alternative option

The previous section presented the results from an alternative option to the main proposed in the text on how the GEP measurement framework must be adapted by the inclusion of footprint indicators. Both options bring different aspects to the analysis, the alternative option is a bit more stringent because it selects the worst performance for each indicator between the production or consumption side; while main option allows for some substitutability across production and consumption by combining the information of each indicator into a single index. In this section, we present some basic comparison across the two options.

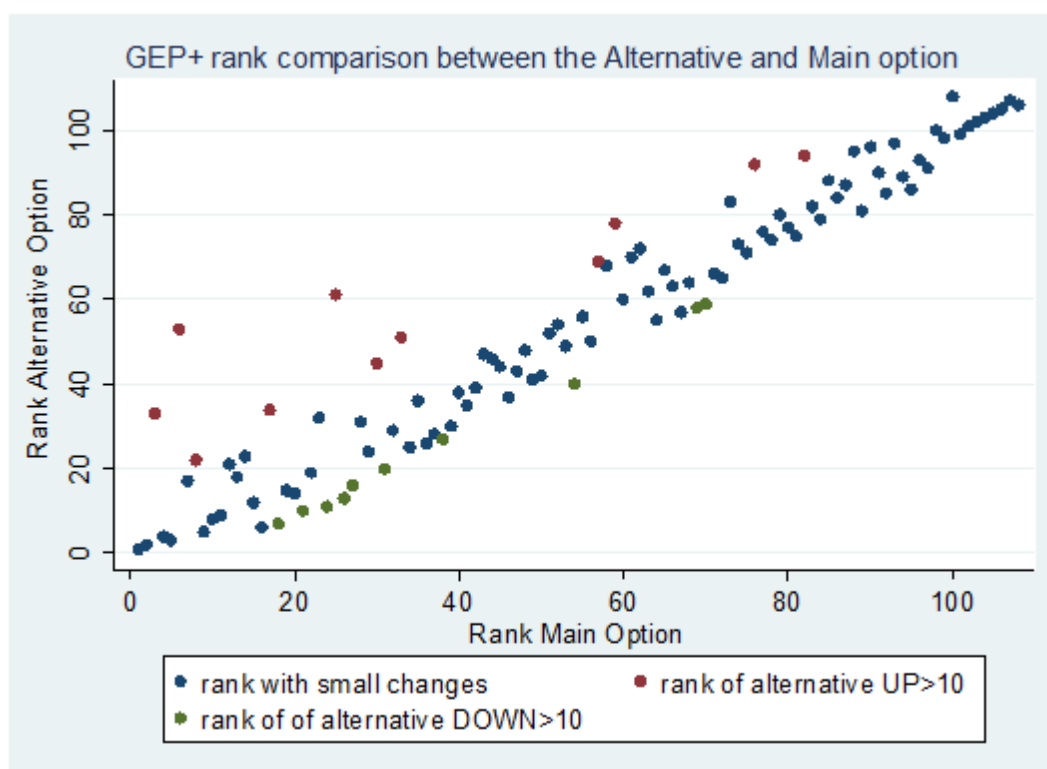
Table AIII.B1 presents the results for the worst performance for the entire sample of 108 countries for the main and alternative option. Results show that the worst performances are on average more negative (higher regress) for the alternative option, which applies a more stringent combination criteria of the footprint indicators. However, the effect on the final ranking of countries is still moderate, although with some variation. In fact, when we combine the entire sample, the correlation between the GEP+ rank between the alternative and the main option is 95.11. Similarly, Figure AIII.B1 shows that most countries preserve a similar ranking under either option (87 countries have a rank change lower than 10 positions). There are 10 countries where the rank drop by 10 or more positions, while there are 11 countries where the rank increases by 10 or more positions. This implies that although different both options convey a similar message.

Table AIII.B1: Summary of the worst performance for the main and alternative option for the GEP+

<i>Indicator</i>	<i>Obs.</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Worst Performance for GEP+ (Main)	108	-0.60	0.89	-4.45	0.40
Worst Performance for GEP+ (Alternative)	108	-0.85	1.03	-4.65	0.17

Source: Author's calculations.

Figure AIII.B1: GEP+ rank comparison between the main and the alternative option



Source: Author's calculations.