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PAGE PARTNERSHIP FOR ACTION ON GREEN ECONOMY

# The Green Economy Progress Measurement Framework

# Application (Second Edition)

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

**Citation**

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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 Analyis 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 its 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 averall 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 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 17 countries have a positive GEP index, in orther 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 data[2].

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 sustainability[6] (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 capital[7]. 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 years[8]. 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 indicators[11] 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 indicators[12] 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 demand[13]. 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 goods[14]. 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 technologies[15], 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 population[16]. 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 poverty[17]. 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 (PM2.5), 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 capita**[18] 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 inclusiveness[19].

**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 inequality[20].

**Pension coverage** is measured by the share of the population above statutory pensionable age receiving an old age pension based on contribution and sex[21].

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[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**

| *Indicator* | *Description* | *Country coverage* | *Data Source* |
|---|---|---|---|
| **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*

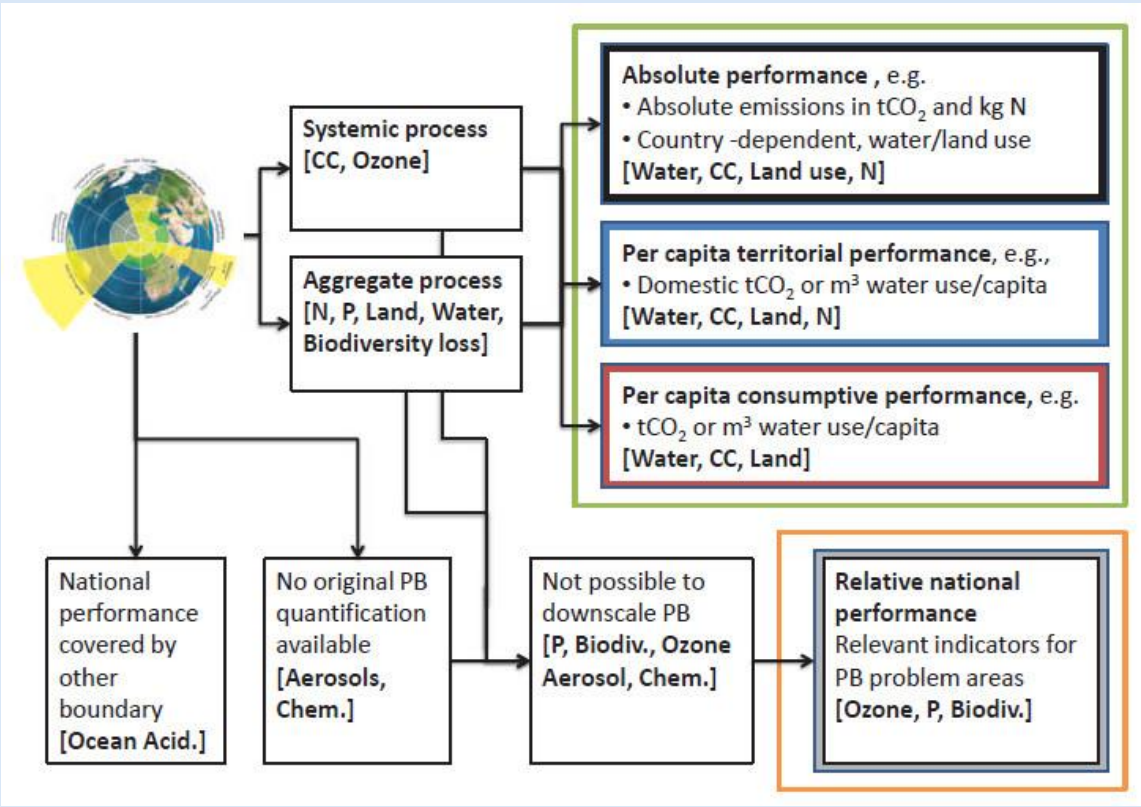
The framework proposed by Rockström et al. (2009) includes a set of nine planetary boundaries, seven of which[1] were quantified and for which specific boundary values were proposed. Since its introduction, the framework has become a point of reference not just for the scientific community but also amongst 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)

| *Description of indicator* | *Country coverage* | *Threshold* | *Data Source* |
|---|---|---|---|
| **Carbon (greenhouse gas) footprint short term ($CO_2$e/capita/year)** | 175 | 2 tons/capita/year | SCP-HAT |
| **Water stress (Mio m3 H2Oeq/1000 capita/year)** | 181 | 6.47 Mio m3 H2Oeq/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

| *"Goods"* | *"Bads"* |
|---|---|
| *Green trade* | *Energy use* |
| *Green innovation* | *Inequality (Palma ratio)* |
| *Renewable energy* | *Air pollution* |
| *Access to water/sanitation/electricity* | *Material footprint* |
| *Protected areas* | *Gender inequality* |
| *Education* | **Greenhouse gas emissions** |
| *Life expectancy* | **Water stress** |
| *Pension coverage* | **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 $\lambda$ (for a "good") or the $\beta$ (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 $\lambda$ or $\beta$ (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 distribution[30]. 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 group[31]. 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 25$^{th}$ (75$^{th}$) 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 75$^{th}$ 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 90$^{th}$ 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 10$^{th}$ 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 countries[33]. 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.

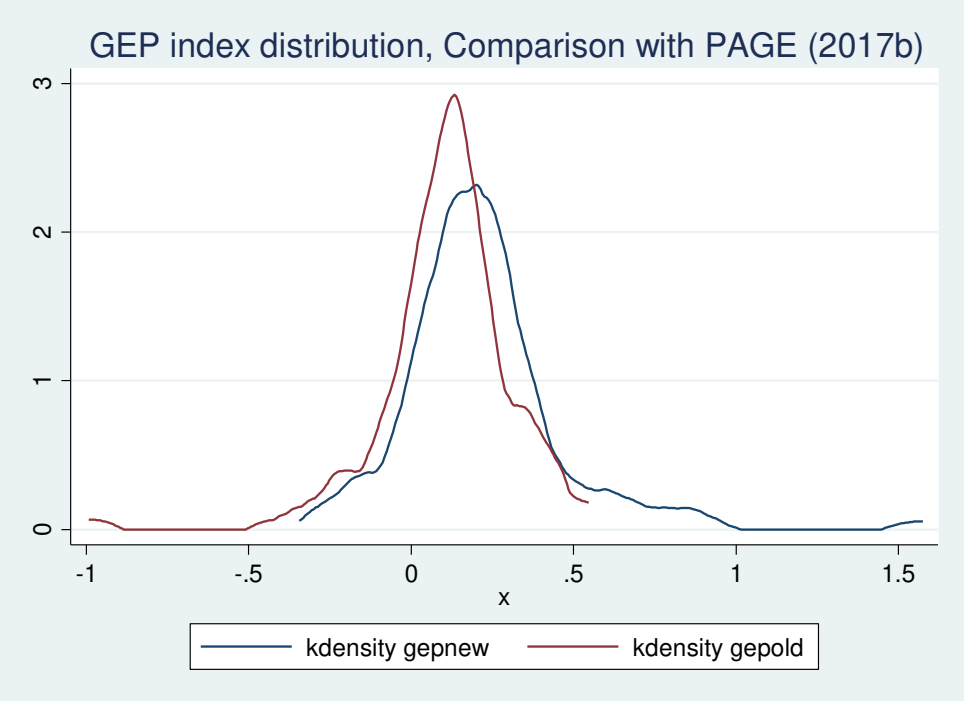
**Table 5: Summary statistics of the GEP Index**

| 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 groups[34]. 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.

[34]The 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)**

| *HDI group* | *Observations* | *Mean* | *Std. Dev.* | *Min* | *Max* |
|---|---|---|---|---|---|
| **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 divided[35]. 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)**

| *Region* | *Obs* | *Mean* | *Std. Dev.* | *Min* | *Max* |
|---|---|---|---|---|---|
| **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)**

| *Region* | *Obs* | *Mean* | *Std. Dev.* | *Min* | *Max* |
|---|---|---|---|---|---|
| **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)**

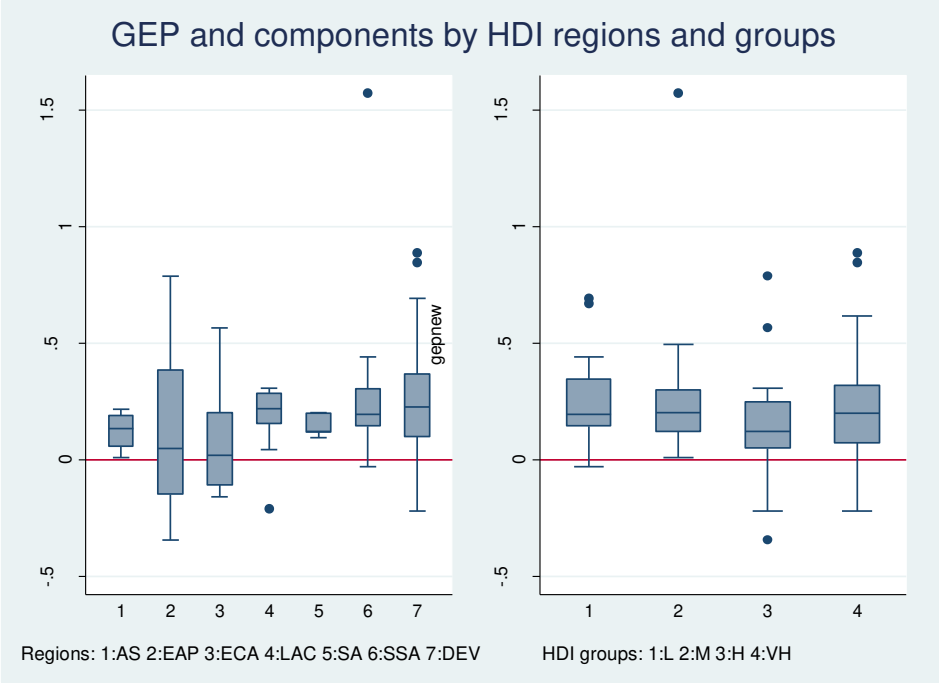
| *Region* | *Obs* | *Mean* | *Std. Dev.* | *Min* | *Max* |
|---|---|---|---|---|---|
| **MENA** | 0 | | | | |
| **EAP** | 3 | -0.21 | 0.13 | -0.34 | -0.08 |
| **ECA** | 4 | -0.13 | 0.02 | -0.16 | -0.11 |
| **LAC** | 1 | -0.21 | . | -0.21 | -0.21 |
| **South Asia** | 0 | | | | |
| **Sub-Saharan Africa** | 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 Index[37]. 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)**

| *Indicator* | *Obs.* | *Mean* | *Std. Dev.* | *Min* | *Max* |
|---|---|---|---|---|---|
| **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, forwater 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 counties 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**

| *Indicator* | *Obs.* | *Progress* | *Regress* |
|---|---|---|---|
| **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 indiactors, 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)**

| *Indicator* | *Obs.* | *Mean* | *Std. Dev.* | *Min* | *Max* |
|---|---|---|---|---|---|
| **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**

| *Indicator* | *Obs.* | *Progress* | *Regress* |
|---|---|---|---|
| **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 indictors 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 Criterion[41] works in determining the ranking within each HDI group[42]. 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)).

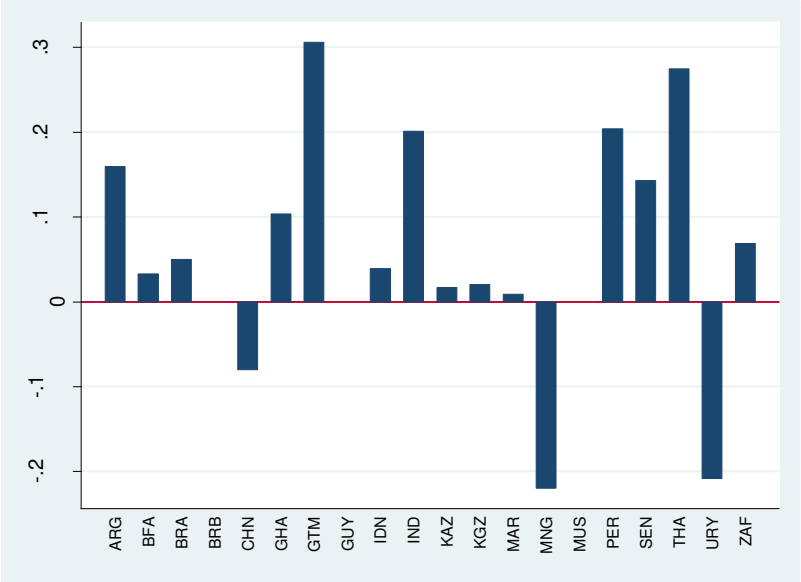
## 3.5 Results for PAGE countries

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 17 countries have a positive GEP index, in orther 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**

| *Country* | *Progress Greenhouse gas emissions* | *Progress Water stress* | *Progress Land Use related biodiversity loss* | *GEP Index* | *Worst performance (for Protective criterion)* | *HDI group* |
|---|---|---|---|---|---|---|
| **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 orther 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 countries 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 $\pi$ | 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 $\pi$ | 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 $\pi$ | 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 $\pi$ | 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 $\pi$ | 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 $\tilde{\pi}$ | Weight $\pi$ | 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 $\pi$ | 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 $\pi$ | 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 $\pi$ | 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 $\pi$ | 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 $\tilde{\pi}$ | 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 $\tilde{\pi}$ | 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 $\tilde{\pi}$ | Weight $\pi$ | 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 $\pi$ | 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 Sustainability[46]

### Greenhouse gas emissions ($CO_2$e/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 $\tilde{\pi}$ | 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 Anexx 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 ($CO_2e$/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 $\tilde{\pi}$ | 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 $\tilde{\pi}$ | 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 $\tilde{\pi}$ | 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 $\hat{\pi}$ | 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 | 0.000000002 | 0.14 | 0.63 |
| **Greece** | 0.0000000391 | 0.0000000256 | 0.0000000333 | -0.0000000009 | -0.023 | 0.000000023 | 1.18 | 0.82 |
| **Guatemala** | 0.0000000123 | 0.0000000104 | 0.0000000333 | -0.0000000001 | -0.010 | 0.000000007 | 0.37 | 0.36 |
| **Honduras** | 0.0000000212 | 0.0000000201 | 0.0000000333 | -0.0000000001 | -0.003 | 0.000000012 | 0.64 | 0.12 |
| **Hungary** | 0.0000000090 | 0.0000000062 | 0.0000000333 | -0.0000000002 | -0.021 | 0.000000005 | 0.27 | 0.73 |
| **India** | 0.0000000078 | 0.0000000066 | 0.0000000333 | -0.0000000001 | -0.010 | 0.000000004 | 0.23 | 0.37 |
| **Indonesia** | 0.0000000394 | 0.0000000623 | 0.0000000333 | 0.0000000015 | 0.039 | 0.000000023 | 1.18 | -1.39 |
| **Ireland** | 0.0000000237 | 0.0000000161 | 0.0000000333 | -0.0000000005 | -0.022 | 0.000000014 | 0.71 | 0.77 |
| **Israel** | 0.0000000303 | 0.0000000207 | 0.0000000333 | -0.0000000006 | -0.021 | 0.000000018 | 0.91 | 0.75 |
| **Italy** | 0.0000000321 | 0.0000000213 | 0.0000000333 | -0.0000000007 | -0.022 | 0.000000019 | 0.96 | 0.80 |
| **Jamaica** | 0.0000000299 | 0.0000000293 | 0.0000000333 | 0.0000000000 | -0.001 | 0.000000017 | 0.90 | 0.04 |
| **Japan** | 0.0000000359 | 0.0000000221 | 0.0000000333 | -0.0000000009 | -0.026 | 0.000000021 | 1.08 | 0.91 |
| **Jordan** | 0.0000000088 | 0.0000000060 | 0.0000000333 | -0.0000000002 | -0.021 | 0.000000005 | 0.27 | 0.76 |
| **Kazakhstan** | 0.0000000359 | 0.0000000364 | 0.0000000333 | 0.0000000000 | 0.001 | 0.000000021 | 1.08 | -0.04 |
| **Kenya** | 0.0000000098 | 0.0000000073 | 0.0000000333 | -0.0000000002 | -0.017 | 0.000000004 | 0.29 | 0.45 |
| **Korea, Rep.** | 0.0000000246 | 0.0000000173 | 0.0000000333 | -0.0000000005 | -0.020 | 0.000000014 | 0.74 | 0.71 |
| **Kyrgyz Republic** | 0.0000000119 | 0.0000000102 | 0.0000000333 | -0.0000000001 | -0.009 | 0.000000007 | 0.36 | 0.34 |
| **Latvia** | 0.0000000073 | 0.0000000093 | 0.0000000333 | 0.0000000001 | 0.018 | 0.000000004 | 0.22 | -0.64 |
| **Lithuania** | 0.0000000076 | 0.0000000086 | 0.0000000333 | 0.0000000001 | 0.009 | 0.000000004 | 0.23 | -0.32 |
| **Luxembourg** | 0.0000000739 | 0.0000000990 | 0.0000000333 | 0.0000000017 | 0.023 | 0.000000033 | 2.22 | -0.62 |
| **Malawi** | 0.0000000028 | 0.0000000017 | 0.0000000333 | -0.0000000001 | -0.027 | 0.000000001 | 0.08 | 0.73 |
| **Malaysia** | 0.0000000305 | 0.0000000255 | 0.0000000333 | -0.0000000003 | -0.011 | 0.000000018 | 0.92 | 0.39 |
| **Mali** | 0.0000000031 | 0.0000000022 | 0.0000000333 | -0.0000000001 | -0.019 | 0.000000001 | 0.09 | 0.52 |
| **Mexico** | 0.0000000699 | 0.0000000521 | 0.0000000333 | -0.0000000012 | -0.017 | 0.000000033 | 2.10 | 0.49 |
| **Moldova** | 0.0000000006 | 0.0000000004 | 0.0000000333 | 0.0000000000 | -0.021 | 0.000000000 | 0.02 | 0.74 |
| **Mongolia** | 0.0000000178 | 0.0000000129 | 0.0000000333 | -0.0000000003 | -0.018 | 0.000000010 | 0.53 | 0.66 |
| **Morocco** | 0.0000000048 | 0.0000000041 | 0.0000000333 | 0.0000000000 | -0.010 | 0.000000003 | 0.14 | 0.36 |
| **Mozambique** | 0.0000000140 | 0.0000000076 | 0.0000000333 | -0.0000000004 | -0.030 | 0.000000006 | 0.42 | 0.82 |
| **Namibia** | 0.0000001180 | 0.0000000790 | 0.0000000333 | -0.0000000026 | -0.022 | 0.000000033 | 3.54 | 0.46 |
| **Nepal** | 0.0000000054 | 0.0000000041 | 0.0000000333 | -0.0000000001 | -0.017 | 0.000000002 | 0.16 | 0.46 |
| **Netherlands** | 0.0000000483 | 0.0000000284 | 0.0000000333 | -0.0000000013 | -0.027 | 0.000000028 | 1.45 | 0.98 |
| **New Zealand** | 0.0000000957 | 0.0000000557 | 0.0000000333 | -0.0000000027 | -0.028 | 0.000000033 | 2.87 | 0.64 |
| **Nicaragua** | 0.0000000250 | 0.0000000186 | 0.0000000333 | -0.0000000004 | -0.017 | 0.000000015 | 0.75 | 0.60 |
| **Norway** | 0.0000000393 | 0.0000000287 | 0.0000000333 | -0.0000000007 | -0.018 | 0.000000023 | 1.18 | 0.64 |
| **Pakistan** | 0.0000000006 | 0.0000000005 | 0.0000000333 | 0.0000000000 | -0.013 | 0.000000000 | 0.02 | 0.36 |
| **Panama** | 0.0000000943 | 0.0000000890 | 0.0000000333 | -0.0000000004 | -0.004 | 0.000000033 | 2.83 | 0.09 |
| **Paraguay** | 0.0000000367 | 0.0000000369 | 0.0000000333 | 0.0000000000 | 0.000 | 0.000000021 | 1.10 | -0.02 |
| **Peru** | 0.0000000362 | 0.0000000301 | 0.0000000333 | -0.0000000004 | -0.011 | 0.000000021 | 1.09 | 0.40 |
| **Philippines** | 0.0000000300 | 0.0000000187 | 0.0000000333 | -0.0000000008 | -0.025 | 0.000000017 | 0.90 | 0.90 |
| **Poland** | 0.0000000082 | 0.0000000074 | 0.0000000333 | 0.0000000000 | -0.006 | 0.000000005 | 0.25 | 0.21 |
| **Portugal** | 0.0000000396 | 0.0000000265 | 0.0000000333 | -0.0000000009 | -0.022 | 0.000000023 | 1.19 | 0.79 |
| **Romania** | 0.0000000105 | 0.0000000104 | 0.0000000333 | 0.0000000000 | -0.001 | 0.000000006 | 0.31 | 0.02 |
| **Russian Federation** | 0.0000000067 | 0.0000000066 | 0.0000000333 | 0.0000000000 | -0.001 | 0.000000004 | 0.20 | 0.02 |
| **Senegal** | 0.0000000037 | 0.0000000023 | 0.0000000333 | -0.0000000001 | -0.025 | 0.000000002 | 0.11 | 0.69 |
| **Singapore** | 0.0000000924 | 0.0000000679 | 0.0000000333 | -0.0000000016 | -0.018 | 0.000000033 | 2.78 | 0.41 |
| **Slovak Republic** | 0.0000000130 | 0.0000000105 | 0.0000000333 | -0.0000000002 | -0.013 | 0.000000008 | 0.39 | 0.45 |
| **Slovenia** | 0.0000000219 | 0.0000000148 | 0.0000000333 | -0.0000000005 | -0.022 | 0.000000013 | 0.66 | 0.77 |
| **South Africa** | 0.0000000870 | 0.0000000515 | 0.0000000333 | -0.0000000024 | -0.027 | 0.000000033 | 2.61 | 0.66 |
| **Spain** | 0.0000000410 | 0.0000000267 | 0.0000000333 | -0.0000000010 | -0.023 | 0.000000024 | 1.23 | 0.83 |
| **Sri Lanka** | 0.0000000039 | 0.0000000035 | 0.0000000333 | 0.0000000000 | -0.008 | 0.000000002 | 0.12 | 0.28 |
| **Sweden** | 0.0000000192 | 0.0000000166 | 0.0000000333 | -0.0000000002 | -0.009 | 0.000000011 | 0.58 | 0.32 |
| **Switzerland** | 0.0000000317 | 0.0000000242 | 0.0000000333 | -0.0000000005 | -0.016 | 0.000000018 | 0.95 | 0.56 |
| **Tajikistan** | 0.0000000014 | 0.0000000025 | 0.0000000333 | 0.0000000001 | 0.047 | 0.000000001 | 0.04 | -1.68 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Tanzania** | 0.0000000096 | 0.0000000037 | 0.0000000333 | -0.0000000004 | -0.041 | 0.000000005 | 0.29 | 1.38 |
| **Thailand** | 0.0000000084 | 0.0000000068 | 0.0000000333 | -0.0000000001 | -0.013 | 0.000000005 | 0.25 | 0.47 |
| **Togo** | 0.0000000034 | 0.0000000024 | 0.0000000333 | -0.0000000001 | -0.021 | 0.000000002 | 0.10 | 0.57 |
| **Tunisia** | 0.0000000098 | 0.0000000070 | 0.0000000333 | -0.0000000002 | -0.019 | 0.000000006 | 0.29 | 0.69 |
| **Turkey** | 0.0000000230 | 0.0000000158 | 0.0000000333 | -0.0000000005 | -0.021 | 0.000000013 | 0.69 | 0.75 |
| **Uganda** | 0.0000000052 | 0.0000000034 | 0.0000000333 | -0.0000000001 | -0.023 | 0.000000002 | 0.16 | 0.63 |
| **Ukraine** | 0.0000000033 | 0.0000000023 | 0.0000000333 | -0.0000000001 | -0.020 | 0.000000002 | 0.10 | 0.70 |
| **United Kingdom** | 0.0000000262 | 0.0000000143 | 0.0000000333 | -0.0000000008 | -0.030 | 0.000000015 | 0.79 | 1.07 |
| **United States** | 0.0000000367 | 0.0000000266 | 0.0000000333 | -0.0000000007 | -0.018 | 0.000000021 | 1.10 | 0.65 |
| **Uruguay** | 0.0000000267 | 0.0000000297 | 0.0000000333 | 0.0000000002 | 0.008 | 0.000000015 | 0.80 | -0.27 |
| **Venezuela, RB** | 0.0000000272 | 0.0000000223 | 0.0000000333 | -0.0000000003 | -0.012 | 0.000000016 | 0.82 | 0.42 |
| **Vietnam** | 0.0000000070 | 0.0000000049 | 0.0000000333 | -0.0000000001 | -0.020 | 0.000000004 | 0.21 | 0.70 |
| **Yemen, Rep.** | 0.0000000035 | 0.0000000023 | 0.0000000333 | -0.0000000001 | -0.023 | 0.000000002 | 0.11 | 0.62 |
| **Zambia** | 0.0000000091 | 0.0000000062 | 0.0000000333 | -0.0000000002 | -0.021 | 0.000000004 | 0.27 | 0.58 |
| **Zimbabwe** | 0.0000000043 | 0.0000000013 | 0.0000000333 | -0.0000000002 | -0.046 | 0.000000002 | 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 $\pi$ | 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** |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | -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 group[47]

| 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 minimun 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 $CO_2$-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 $tCO_2e$ 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 (Nykvist et al., 2013). Thresholds for nitrogen concentrations, freshwater use[49] 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) (Nykvist et al., 2013).[50]

**Table AII.1: Dashboard indicators**

| *Description of indicator* | *Country coverage* | *Threshold* | *Data Source* |
|---|---|---|---|
| **Freshwater withdrawal ($m^3$/capita/year)** | 49 | 585 $m^3$ / capita /year | WDI |
| **Greenhouse gas emissions, excluding land-use change and forestry ($CO_2e$/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 ($m^3$/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 $\tilde{\pi}$ | 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 |

Source: Authors' calculations.

## Greenhouse gas emissions ($CO_2$e/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 AII.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 AII.2 below is that, across all indicators, some countries are experiencing significant regress (progress lower than -1).

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

| *Indicator* | *Obs.* | *Mean* | *Std. Dev.* | *Min* | *Max* |
|---|---|---|---|---|---|
| **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 AII.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 Index[51]. This regress is consistent with the negative average value in Table AII.2 and with the regress found for the other dashboard indicators.

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

| *Indicator* | *Obs.* | *Progress* | *Regress* |
|---|---|---|---|
| **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 |

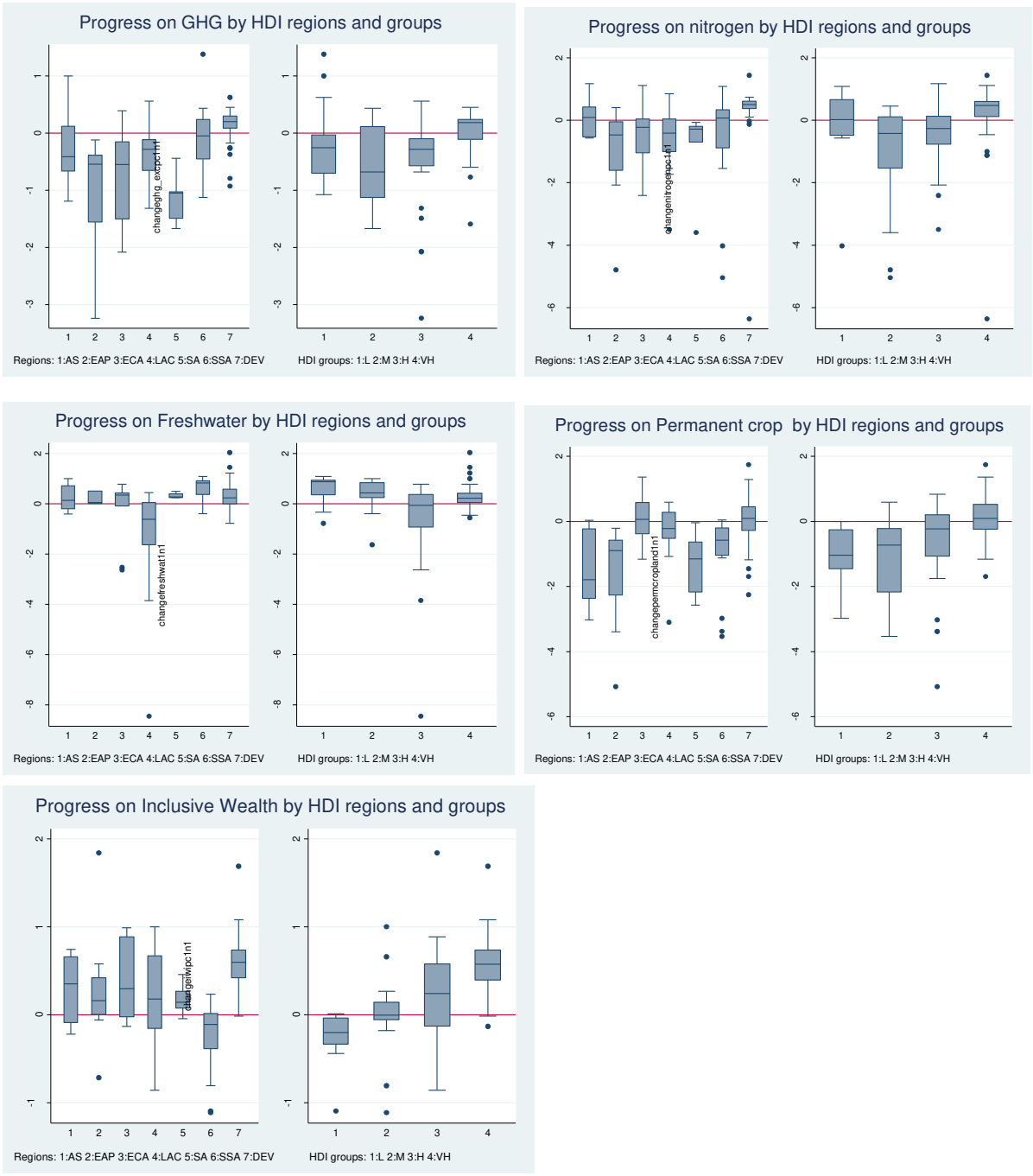
Source: Author's calculations.

Figure AII.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 permament 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 Medium[52].

[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 minimun 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 group[60]

| 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 minimun 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 if 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.

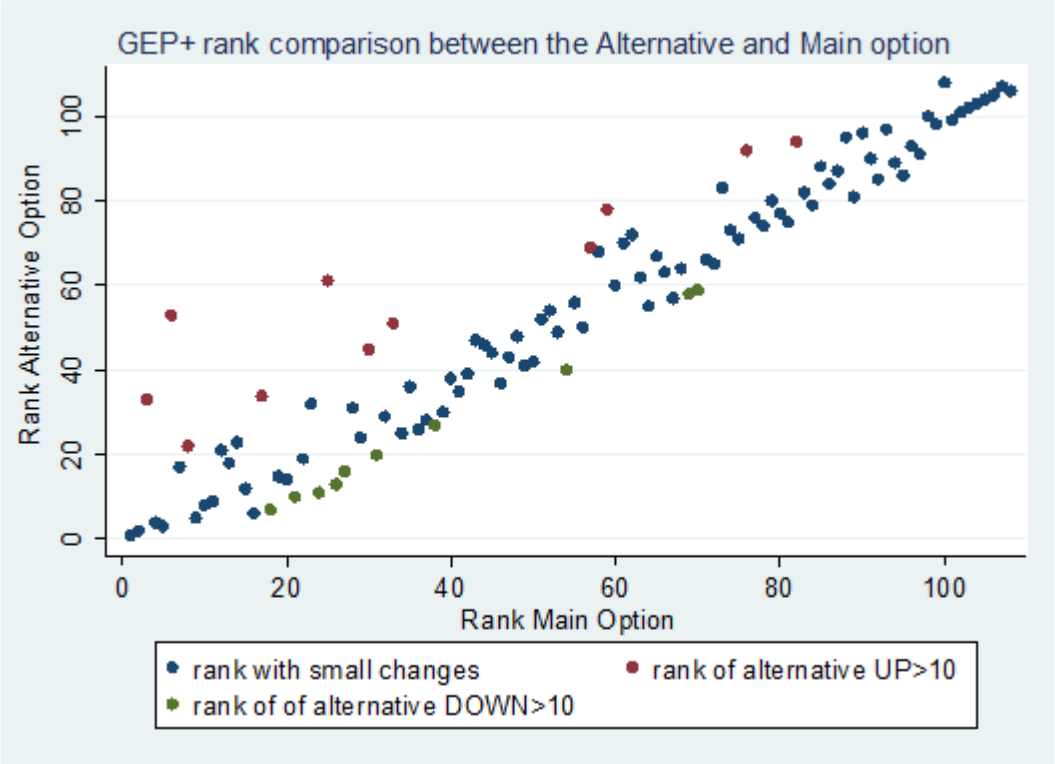
Table AIII.B1 presents the results for the worst performance for the entire sample of 108 countries for the main and alternative option. Results show that the worst performances are on average more negative (higher regress) for the alternative option, which applies a more stringent combination criteria 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+**

| *Indicator* | *Obs.* | *Mean* | *Std. Dev.* | *Min* | *Max* |
|---|---|---|---|---|---|
| **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.