

Natural Capital in Ethiopia, Indonesia, and Trinidad and Tobago

Trends and policy implications

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Key Messages

- Natural capital in Ethiopia, Indonesia, and Trinidad and Tobago is not being well managed. All three countries experienced either stagnation or decline in per capita market natural capital stocks following the 2008 global financial crisis.
- Market natural capital is overly concentrated in oil and gas and minerals in Indonesia and Trinidad and Tobago, while in Ethiopia, it is overly concentrated in agricultural land. In Trinidad and Tobago, the situation is serious enough to fundamentally question the sustainability of the country's fossil fuel-driven development approach.
- Non-market natural capital is under threat in all three countries due to, among others, population increases and climate change.
- If current trends in natural capital continue, it is very likely that future generations in these countries will be worse off. In Trinidad and Tobago, declines in well-being are likely imminent.
- Measuring and monitoring natural capital is a fundamental step to understanding how the overall wealth portfolio is being managed and designing appropriate policies to ensure that development is sustainable.
- All countries should understand that natural capital preservation is an integral part of development and that using up natural capital for the sake of economic growth can have severe long-term consequences for well-being.
- Reversing the decline of natural capital will require concerted action backed up by strong political commitment to invest in green technologies such as renewable energy, mobilize financial resources for natural capital preservation, and build environmental statistical capacity.



For more than half a century, GDP has been accepted as the most relevant measure of a country's economic success. GDP is defined as the aggregate measure of income in an economy during a given time period. However, it is often used, inappropriately, as a proxy measurement for well-being more broadly. A recent policy brief published by the UN Secretary-General invites member states to move beyond GDP by measuring what truly matters for sustainability and prosperity (United Nations, 2023). It demonstrates just how damaging it can be to rely on GDP as a broad measure of progress. This note outlines the shortcomings of GDP as an indicator of progress. It suggests more meaningful measures that meet the UN Secretary-General's criteria for robust metrics that can move the world beyond GDP: concise, widely accepted, comparable, iterative and dynamic, country-owned, scientifically robust, statistically sound, and applicable to decision making (United Nations, 2023).

Box 1. Comprehensive/inclusive wealth measures five types of assets:

- **Produced capital** consists of roads, railways, ports, houses, machinery, and other manufactured assets.
- **Natural capital** includes market-oriented natural resources such as timber, minerals, oil, and gas. It also includes the non-market economic value of ecosystems, such as wetlands, and forests.
- **Human capital** comprises the collective knowledge, skills, and capabilities of the labour force—the result of lifelong learning in both formal and informal settings.
- **Financial capital** includes bank deposits, stocks, bonds, and other forms of financial assets.
- **Social capital** represents the norms and behaviours that structure and support productive interactions between members of society, including safety, inclusivity, and trust in institutions.

Sources: *International Institute for Sustainable Development (IISD), 2018; World Bank, 2021.*

While gains in GDP are, under certain conditions, linked to improved human well-being, there are well-documented negative impacts on well-being associated with GDP growth. These negative impacts can include the depletion of natural resources, increasing greenhouse gas emissions, and a growing divide between the rich and poor. In addition, GDP figures do not capture the value of important long-term investments in human well-being, such as education and health care, or the value of many measures to address climate change. There is a growing body of applied research to identify indicators intended to address the shortcomings of GDP as a measure of well-being. Such indicators are intended to better reflect our understanding of prosperity. Among the various indicators, comprehensive or inclusive wealth (C/IW) is seen as a methodologically sound measurement that complements GDP and meets the criteria of the new measures laid out by the UN Secretary-General (United Nations, 2023). C/IW is a valuable instrument for policy-makers to use to move beyond GDP and better reflect the foundations of prosperity and well-being in their decisions.



Partial findings of the project on Measuring Comprehensive Wealth to Promote Sustainable Development¹ carried out by IISD are summarized below. This project developed C/IW estimates for Ethiopia, Indonesia, and Trinidad and Tobago and identified their relevance to policy making. The findings reported here focus only on natural capital (see Box 1 for a description of all five elements of the C/IW portfolio). Additional notes in this series focus on the results relating to other elements of the C/IW portfolio.

What Is Natural Capital?

Natural resources play fundamental roles in our well-being and lives. Oceans, forests, lakes, rivers, and grasslands—and the biodiversity they support—contribute to nourishing us, regulating air quality, cleansing water, and myriad other benefits we enjoy daily. It is estimated that at least 87% of the world's population lives in areas benefiting from nature for food, water, raw materials, and cultural uses (Chaplin-Kramer et al., 2023). The benefits of natural capital can be social, economic, and cultural. Minerals, timber, and energy resources, for example, are important sources of income, not least for low-income countries. The extent of these and other benefits depends on the “stocks” (or physical quantities) of natural capital available in a country. Since these stocks are subject to depletion and degradation as a result of human use, it is crucial that they be measured and studied to ensure they are growing—or at least stable—both in quantity and quality over time. If they are not, development and well-being are threatened.

According to the United Nations et al. (2014) *System of Environmental-Economic Accounting: Central Framework*, natural capital can be categorized into three types: space for human and natural activities (land); underground stocks of minerals, fossil fuels, and water (subsoil resources); and self-maintaining natural systems that provide ongoing flows of ecosystem goods and services, such as carbon sequestration (ecosystems). Some types of natural capital provide benefits that are realized through market transactions (such as the extraction of minerals or timber), while others provide benefits that do not flow through markets (such as the enjoyment of a free recreational area). We refer to the former as market natural capital and the latter as non-market natural capital.

Trends for Natural Capital

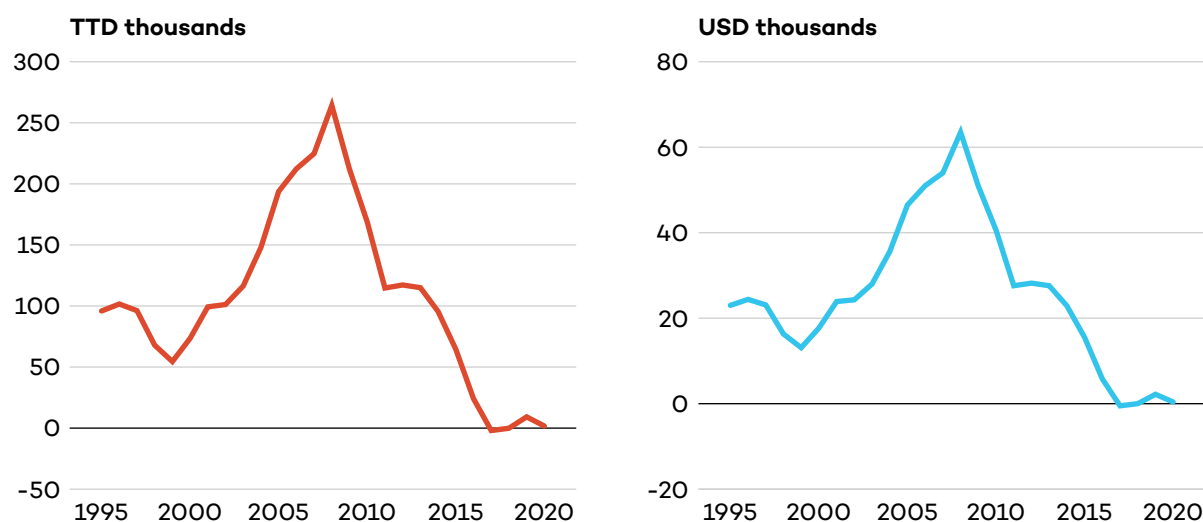
Recent global estimates from the World Bank (2021) show declining renewable natural capital stock values (forests, mangroves, fisheries, agricultural land, and protected areas), reflecting the overexploitation or degradation of ecosystem services worldwide. The value of forest wealth (timber plus ecosystem services) in real per capita terms dropped by 8% between 1995 and 2018, driven by population growth and a loss of forest areas. The real per capita value of non-renewable natural capital assets (fossil fuels and minerals) grew rapidly from 1995 until around 2014. Afterward, it declined in value by 35% up to 2018, driven mainly by falling petroleum prices.

¹ See more on the project here: <https://www.iisd.org/projects/measuring-wealth-promote-sustainable-development>



We measured the value of market natural capital in this project in real (inflation-adjusted) per capita terms in both local currencies and United States dollars (USD)² to allow for comparison among the countries. In Trinidad and Tobago (Figure 1), the real per capita value of market natural capital nearly tripled from 1995 to 2008, increasing from around TTD 96,000 (USD 23,000) to TTD 264,000 (USD 63,500). However, after 2008—the year of the global financial crisis—market natural capital declined rapidly in value to the point where it had almost vanished by 2017. Looking at the whole period, market natural capital had lost 98% of its 1995 value by 2020, a cause for concern in a country so dependent on fossil fuel wealth. This near-complete loss of the country’s market natural capital value was a result of multiple factors, including the fall in global oil prices and demand during and after the 2008 crisis, the depletion of the country’s energy reserves, and declining production. Data on natural gas and oil production show that natural gas production had fallen by 42% from its peak (December 2009) by December 2020 (Central Bank of Trinidad and Tobago, n.d.). Oil production, for its part, had fallen by 64% from its (May 2005) peak (Central Bank of Trinidad and Tobago, n.d.).³

Figure 1. Trinidad and Tobago: Natural capital per capita at 2017 prices



Source: Authors’ calculations based on data provided by the Trinidad and Tobago Central Statistical Office (CSO), the National Archive, the Central Bank, the Ministry of Energy and Energy Industries, and the United Nations.

In Ethiopia and Indonesia (Figures 2 and 3), real per capita market natural capital grew over the same period in both countries (2.1% and 1.8% annual average growth, respectively). The impact of the global financial crisis is again apparent, as all this growth occurred in years

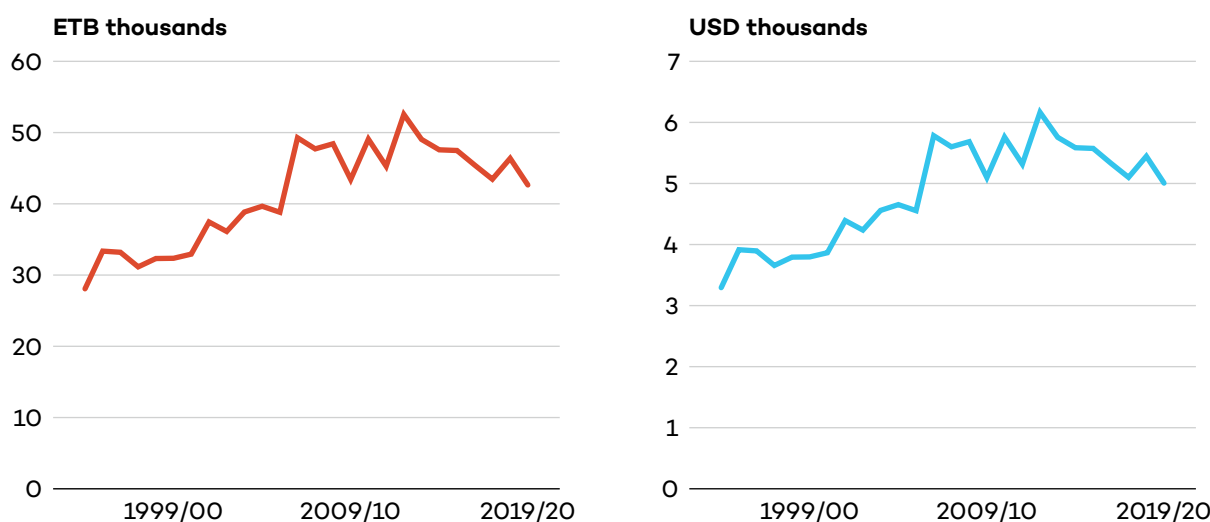
² All values in constant local currency use 2017 as the base year (and 2016/17 as the base for Ethiopia). All values in constant USD also use 2017 as the base year and the 2017 purchasing power parity (PPP) conversion rate from local currency to USD as reported by the World Bank (n.d.). The application of the 2017 PPP conversion rate to the entire time series results in identical growth trends over time regardless of whether the results are presented in constant local currency or constant USD.

³ Natural gas and oil production remained at levels close to those of December 2020 in August 2023, the most recent period for which data are available (Central Bank of Trinidad and Tobago, n.d.).



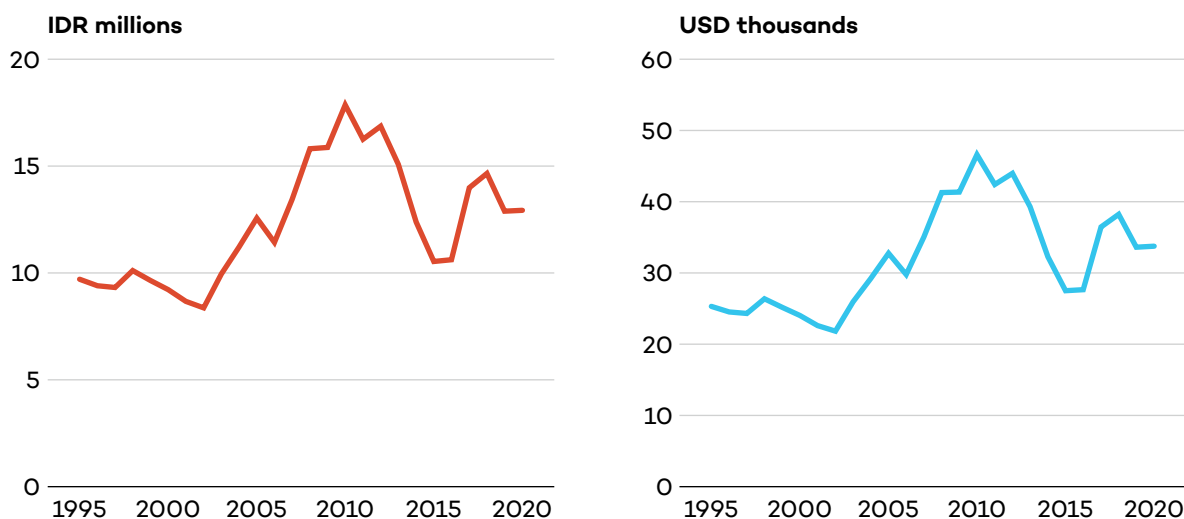
before 2008. Ethiopia’s natural capital wealth was essentially flat in real per capita terms after 2008, while that of Indonesia declined considerably.

Figure 2. Ethiopia: Natural capital per capita at 2017 prices



Source: Authors’ calculations based on data provided by the Ethiopian Central Statistical Agency, the National Bank of Ethiopia, the Natural Gum Production and Marketing Enterprise (NGPME), and the Food and Agriculture Organization of the United Nations (FAO).

Figure 3. Indonesia: Natural capital per capita at 2017 prices



Source: Authors’ calculations based on data provided by BPS-Statistics Indonesia, the Ministry of Agriculture, FAO, and the U.S. Geological Survey.

Figure 4 shows that agricultural land plays a particularly important role in natural capital in Ethiopia and, to a lesser extent, in Indonesia. In Ethiopia, the contribution of agricultural land to market natural capital was about 93% in 2020, far above the World Bank’s estimated global average of 62% in 2018 (World Bank, 2021). Forest land made up nearly all the

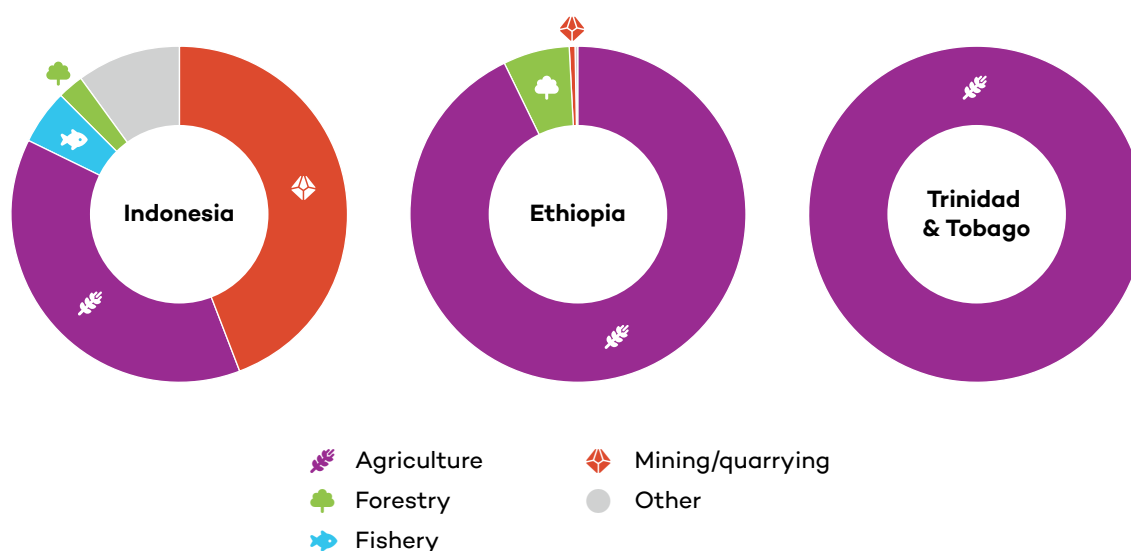


remaining market natural capital wealth in Ethiopia, meaning that the country's abundant mineral and hydroelectric resources contributed almost nothing to the average Ethiopian's well-being in 2020.

In Indonesia, agricultural land represented 38% of natural capital wealth in 2020, placing it behind fossil fuel and mineral assets (the country's most important market natural asset), which accounted for 44% (see Figure 4). The latter figure reflects Indonesia's global importance as a producer of non-renewable resources. It ranks among the top producers of timber, fish, coal, natural gas, oil, nickel, gold, tin, and copper globally.

In Trinidad and Tobago, agricultural land⁴ accounted for all of the country's market natural capital wealth in 2020, which was unusual, due to the fact that its normally valuable fossil fuel assets fell to zero in that year. Since agricultural land is not an especially valuable asset in Trinidad and Tobago, this meant that the total value of the country's market natural capital was also close to zero in that year. During most years in the study period, however, agricultural land accounted for less than 5% of market natural capital.

Figure 4. Distribution of natural capital across countries (2020)



Sources: Authors' calculations based on data from national and international sources. Indonesia: BPS-Statistics Indonesia, Ministry of Agriculture, FAO, and U.S. Geological Survey; Ethiopia: Ethiopian Central Statistical Agency, National Bank of Ethiopia, Natural Gum Production and Marketing Enterprise and FAO; Trinidad and Tobago: Central Statistical Office, National Archive, Central Bank, Ministry of Energy and Energy Industries, and the United Nations.

Notes: For Trinidad and Tobago, agricultural land also includes forest land and fisheries. Distinguishing between the three assets was not possible due to a lack of data. The share of natural capital for fossil fuels and minerals for Trinidad and Tobago was set to zero due to negative rents in 2020.

Non-market natural capital, for its part, showed negative trends in all countries. From 1995 to 2020, the land area available per capita in Ethiopia declined by 50%, while that in Indonesia and Trinidad and Tobago declined by 28% and 8%, respectively (Table 1). Forests, which

⁴ For Trinidad and Tobago, the value of agricultural land also includes the value of the country's forest land and fisheries.



are important ecosystems in all countries but especially in Indonesia, declined even more significantly. Indonesia's per capita forest area declined by 38% over the period, while that of Ethiopia and Trinidad and Tobago declined by 42% and 12%, respectively (Table 1).

Trends in temperature and precipitation, which are used here as proxies for the functioning of the climate system as an asset, were consistent with the predicted effects of climate change (Intergovernmental Panel on Climate Change, 2023). Temperature trends were considered in terms of the departure of the annual average temperature from the historical (1981–2010) “normal” (or average). Estimates using data provided by AidData (n.d.) for Ethiopia, BPS-Statistics Indonesia (n.d.), and the Trinidad & Tobago Meteorological Service (2024) show that all average annual temperature departures from normal for the three countries went up—by 0.2°C in Ethiopia; by 0.3°C in Indonesia; and by 0.4°C in Trinidad and Tobago.

Precipitation trends were, similarly, considered in terms of the annual average departures from the 1981–2010 normal using data from AidData (n.d.) for Ethiopia, BPS-Statistics Indonesia (n.d.), and the Trinidad & Tobago Meteorological Service (2024). In Ethiopia, average annual precipitation over the period was 4% above normal. In Indonesia, the corresponding figures were 2% above the annual normal, and in and Trinidad and Tobago, they were 5% below normal.

Table 1. Trends in land areas per capita

Land area (ha/capita)	Indonesia			Ethiopia			Trinidad and Tobago		
	1995	2020	Change	1995	2020	Change	1995	2020	Change
Total land area	0.99	0.73	-27%	2.00	0.99	-50%	0.41	0.38	-8%
Forest land	0.65	0.40	-38%	0.37	0.21	-42%	0.19	0.17	-12%

Source: Authors' calculations based on data provided by AidData (n.d.) for Ethiopia, BPS-Statistics Indonesia (n.d.), and the Trinidad & Tobago Meteorological Service (2024).

Policy Implications

Measuring and monitoring natural capital is a fundamental step in understanding how the overall wealth portfolio is being managed and in designing appropriate policies to ensure development is sustainable. The results presented here—for the first time ever—show that natural capital is not being well managed in Ethiopia, Indonesia, and Trinidad and Tobago. All three countries experienced either stagnation or decline in per capita market natural capital stocks following the 2008 global financial crisis. In Trinidad and Tobago, the declines are serious enough to fundamentally question the sustainability of the country's fossil fuel-driven development approach. On top of this, land areas are under pressure from expanding populations, and climate change is driving temperatures and precipitation away from their historical norms and into uncharted territory. The following policy recommendations can be drawn from the study:



- **There is a pressing need to move beyond GDP.** The average real per capita GDP growth from 1995 to 2020 was around 4.3% in Indonesia (BPS-Statistics Indonesia, n.d.). During the same period, its market natural capital grew much more slowly (1.8% annually) and actually declined in the years following the global financial crisis. On top of this, the area of forest land per capita declined by 38%, and trends in temperature and precipitation were consistent with scientific predictions around climate change. Similar evidence emerged for Ethiopia and, especially, Trinidad and Tobago. In both countries, real per capita GDP growth tells a much more positive story of development than the evolution of wealth does. This raises the question of when decision-makers are well served by GDP. It suggests that GDP growth tells, at best, a partial story of development, leaving out crucial information about the natural wealth that underpins it. Countries should understand that natural capital preservation is an integral part of development and that using up natural capital for the sake of economic growth can have severe long-term consequences for well-being.
- **More green development policies are needed.** Increasing land pressure, climate change, resource depletion, and other human impacts show that natural capital is under constant threat. As a result, countries are more and more vulnerable to natural disasters such as desertification, floods, and forest fires. Building prosperity will require the development of effective new policies and the reinforcement of existing ones. Data show, for example, that while Indonesia has implemented at least 150 climate policies since 1995, only 17 were identified by national experts as having high potential to reduce greenhouse emissions (Climate Policy Database, n.d.).⁵ For Ethiopia, only six out of 24 were identified as having high impact potential (Climate Policy Database, n.d.).
- **Financial resources need to be mobilized.** Financing is one of the most challenging steps to achieving natural capital conservation. The UN Environmental Programme has estimated that the current financial flows to nature-based solutions⁶—currently valued at USD 154 billion annually—must triple by the end of the decade to address sustainability crises, such as climate change, biodiversity loss, and land degradation (UN Environment Programme, 2022). To address these challenges and build national wealth, several avenues can be explored nationally and internationally. Debt-for-nature swaps,⁷ for example, can help improve countries' net international financial position and address biodiversity crises. This approach was tested in 2009 between Indonesia and the United States for ecosystems in Sumatra, with a swap of nearly USD 30 million (Huff, 2009). The integration of natural capital accounting into companies' and countries' balance sheets would contribute to fostering conservation practices and help reduce the financing gap. Similar initiatives include carbon taxes, payments for ecosystem services, and green bonds.

⁵ The remaining are unknown.

⁶ Nature-based solutions are sets of actions that aim to address societal challenges, such as climate change, biodiversity loss, water security, disaster risk, and human well-being. These actions include, for example, tree growing, ecotourism, beekeeping, renewable energy, mangrove and peatland restoration, and green infrastructure.

⁷ A debt-for-nature swap is defined as the forgiveness of debt in exchange for a commitment by the debtor to mobilize domestic resources for the environment.



- **Data and capacity gaps should be addressed.** Governments should invest in natural capital measurement and monitoring through national statistical and environmental agencies. Data gaps were found in all three countries when this study was implemented, so our estimates do not capture all important natural assets. In many instances, assumptions were required to fill these gaps. In Trinidad and Tobago, for example, although data to value fossil fuel wealth were generally available, it proved difficult to obtain up-to-date data on important variables like resource reserves, so current estimates had to be extrapolated. Data on non-market natural capital were sparse in all three countries, so our estimates covered just a few variables for which data were reasonably easily found. All these challenges considerably affect the quality of the results and, therefore, their utility for developing policies for natural capital preservation.



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