WBG SCORECARD FY24-FY30 METHODOLOGY NOTE

WBG Client Context & Vision Indicators

The purpose of this note is to ensure the rigor, transparency, and reproducibility of the WBG client context and vision indicators included in the new WBG Scorecard FY24-FY30, as well as their alignment with the WBG's vision. Technical teams were asked to provide a sufficiently detailed methodology so that anyone who reads this note can understand its rationale, theory of change, data sources, and method of calculation.

Definitions included in this template are aligned to the WBG Scorecard paper endorsed by the Board on Dec 19th, 2023. The methods notes are living documents and will be subject to updating and revision pending operational inputs and implementation lessons over time.

OVERVIEW	
INDICATOR NAME	**Countries with increasing renewable natural capital per capita**
SUB-INDICATORS	N/A
VISION / CLIENT CONTEXT	☐Vision indicator ☒Client context indicator
OUTCOME AREA	☐Protection for the Poorest ☐Healthier Lives ☒Green and blue planet and resilient populations ☐Sustainable food systems ☐Affordable, reliable, and sustainable energy for all ☐Digital services ☐More and Better Jobs ☐No Learning Poverty ☐Effective Macroeconomics and Fiscal Management ☐Inclusive and equitable water and sanitation services ☐Connected Communities ☐Digital connectivity ☐Gender equality and youth inclusion ☐Better Lives for People in Fragility, Conflict, and Violence ☐More private investments
SDG ALIGNMENT	**See https://sdgs.un.org/ for further details on SDGs:** ☐ 1. No Poverty ☐ 2. Zero Hunger ☐ 3. Good Health and Well-being ☐ 4. Quality Education ☐ 5. Gender Equality ☐ 6. Clean Water and Sanitation ☐ 7. Affordable and Clean Energy ☐ 8. Decent Work and Economic Growth ☐ 9. Industry Innovation and Infrastructure ☐ 10. Reduced Inequalities ☐ 11. Sustainable Cities and Communities ☒ 12. Responsible Consumption and Production ☐ 13. Climate Action ☐ 14. Life Below Water ☐ 15. Life on Land ☐ 16. Peace, Justice and Strong Institutions ☐ 17. Partnerships for the Goals List of specific UN targets (if applicable):
UNIT OF MEASURE	☐Number of people ☒Number of countries ☐USD ☐GW ☐Hectares ☐tCO2eq/year ☐Other: _____ [Please specify]
LEGACY INDICATOR NAME	☐WB Old Scorecard indicator: ☐WBG Old Scorecard indicator: ☒N/A
RATIONALE	
DEFINITION	The number of countries with positive changes in renewable natural capital per capita, based on a subset of assets in the renewable natural capital data series currently produced as part of the *Changing Wealth of Nations* publication and published on the World Development Indicators database. Renewable natural capital includes estimates of forest (accounting for timber and ecosystem services), mangroves, fisheries, agricultural land, and hydroelectric resources. If the change in the

	aggregated per capita value of these assets increases over a 3-year time frame, the country contributes positively to the indicator.
DEVELOPMENT RELEVANCE	Renewable natural capital is an indicator of sustainable natural resource management, and is correlated with the state of nature, environment and services provided by natural assets to people. Although in many cases overall economic wealth may be increasing, a growing body of evidence is showing how manmade capital and human capital cannot substitute for many of the services provided to people and the economy by nature. Therefore, a consistent decline in renewable natural capital wealth provides an early warning that an economy is on an unsustainable development path, putting livelihoods dependent on environmental assets at risk.
LIMITATIONS	Some of the components of this indicator rely on the financial valuation of natural assets based on ecosystem services that are very complex to model. The underlying assumptions/proxies are adapted to each country according to multidimensional parameters: socioeconomic, geographical, bioclimatic, etc., that require public information, such as land transaction prices or exact land use. Typically, the FAO data on the area of agricultural land, crops, livestock, and forestry, is sparse for island economies, city states, and other small countries. In data-poor countries, the methodology often falls back on gap-filling rules based on averaged or extrapolated measures that are difficult to verify. In the countries suffering a total lack of information, values can be assumed to be equal to zero (e.g., livestock production in small states and islands), which might establish an incorrectly low baseline. The latest methodology is driven by changes in the physical volume of each asset (e.g., number of trees, fish, extent of mangroves) and the relative economic value of each asset. However, there are limited adjustments for changes in quality of the in-situ volume of assets and the possible loss in value from quality changes. Issues such as land degradation, overfishing of important fish species, and the quality of mangroves, are only captured to a limited extent. Natural assets are exposed to climate variability and extremes (e.g., droughts, forest fires, flooding, etc.) that are expected to be increasingly intensified, frequent, and uncertain. The economic valuation component of the methodology assesses natural assets according to an expected lifetime of up to 100 years and assumes that current economic returns (the economic rent) remain constant throughout this period. This is intentional, as it is the most neutral assumption for an economic statistic and provides a benchmark for others to run scenario analysis on. However, it may undervalue specific renewable natural capital assets which are expected to become scarcer and more valuable in future years due to the effects of climate change.

DATA AND CALCULATION

DATA SOURCE(S)	The renewable natural capital data are sourced from *The Changing Wealth of Nations* report, published by the World Bank Group. The original data used for the volumes of each category of asset are collected from different sources: • **Forest (timber and ecosystem services)**: Data on forest area (including protected areas) and productive timber forest areas are obtained from the FAOSTAT database maintained by the Food and Agricultural Organization of the UN (FAO). • **Mangroves**: The data on mangroves area are obtained from the Global Mangrove Watch database. • **Ocean resources**: The fish biomass information is sourced from FAO, the Sea Around Us (SAU) reconstruction database and the Fishery Research Unit from the University of British Columbia. • **Agricultural land**: The data on agricultural land area are obtained from the FAOSTAT database. • **Renewable energy (hydroelectric resources):** The data on the quantity of electricity generated are obtained from International Renewable Energy Agency (IRENA). For the valuation of renewable natural capital assets used to estimate the relative economic value of these assets in the volume index, the residual value method/net present value approach is used.

In it, the value of a nation's stock of agricultural land, timber, wild capture marine fish stocks, or hydropower is measured as the present discounted value of the stream of rents expected typically over a 100-year horizon. The data sources for the individual rent calculations are provided below.

METHOD OF CALCULATION (CORE)

Renewable natural capital accumulation is derived from a subset of components in the natural capital data published on the World Bank's wealth accounts. Note that natural_capital includes both renewable and non-renewable natural capital. However, for this indicator, only the renewable natural capital components are included.

1. Overall calculation methodology

1.1. A volume-based index for renewable natural capital

The renewable natural capital asset value is based on a Törnqvist volume-index, which is a weighted geometric mean of the quantity changes of each asset in the index. The weights are applied by the relative economic value of the asset relative to the total value of all renewable natural capital assets. This methodology is commonly used for other economic statistics such as GDP to estimate 'real' changes in economic outputs. More details on this approach will be included as part of the CWON 2024 publication.

The generic formula to compute the Törnqvist volume index is as follows:

$$Törn_t = \prod_{a=1}^{k} \left(\frac{q_{a,t}}{q_{a,t-1}}\right)^{\theta_{a,t}} = \left(\frac{q_{1,t}}{q_{1,t-1}}\right)^{\theta_{1,t}} \times \left(\frac{q_{2,t}}{q_{2,t-1}}\right)^{\theta_{2,t}} \times \ldots \times \left(\frac{q_{k,t}}{q_{k,t-1}}\right)^{\theta_{k,t}}$$

where:

- $q_{a,t}$ is the volume of asset a in year t, where $a = \{1, 2, \ldots, k\}$
- $q_{a,t-1}$ is the volume of asset a in year $t-1$ and
- $\theta_{a,t}$ is the weight of asset a in year t for all assets $\{1, 2, \ldots, k\}$

The weight $\theta_{a,t}$ of asset a is the arithmetic average of the shares of asset a in the total nominal value of all assets included in the index in period t and $t-1$, and is defined as:

$$\theta_{a,t} = \frac{1}{2}\left[s_{a,t} + s_{a,t-1}\right] = \frac{1}{2}\left[\frac{w^n_{a,t}}{w^n_t} + \frac{w^n_{a,t-1}}{w^n_{t-1}}\right]$$

where:

- $s_{a,t}$ is the share of asset a in the nominal value of all assets $\{1, 2, \ldots, k\}$ included in the index in year t, defined as $s_{a,t} = \frac{w^n_{a,t}}{w^n_t}$
- $s_{a,t-1}$ is the share of asset a in the nominal value of all assets $\{1, 2, \ldots, k\}$ included in the index in year $t-1$, defined as $s_{a,t-1} = \frac{w^n_{a,t-1}}{w^n_{t-1}}$
- w^n_t is the nominal value of all assets $\{1, 2, \ldots, k\}$ included in the index in year t, defined as $w^n_t = \sum_{a=1}^{k} w^n_{a,t}$ where $w^n_{a,t}$is the nominal value of asset a in year t
- w^n_{t-1} is the nominal value of all assets $\{1, 2, \ldots, k\}$ included in the index in year $t-1$, defined as $w^n_{t-1} = \sum_{a=1}^{k} w^n_{a,t-1}$ where $w^n_{a,t-1}$is the nominal value of asset a in year $t-1$

Volume should be understood to be a physical quantity (or a proxy for a quantity) of a given asset. As an example, the volume of agricultural land assets is measured in hectares and the volume of oil assets is measured in barrels. The purpose of the volume index is to permit these volumes to be summed, even though they are measured in different units.

The above index is then 'chained' which is a statistical technique to link multiple years of data together to produce a coherent time trend.

1.2. The economic value of renewable natural capital

	While the volumes are very straightforward to understand as they are pure physical quantities, the economic values that are used to derive the weights in the index are more complex but follow internationally agreed statistical standard on how to value environmental assets. The value of each asset is based on the net present value of the economic returns to each asset. The economic return is the economic rent, which is approximated using a 'residual value methodology', where the operating costs and normal returns to capital are deducted from the revenues of each asset. The net present value calculated then assumes rents are constant based on the current year's value, the lifetime of the resource is 100 years, and applies a uniform discount rate of 4%. The indicator attempts to use values closest to the principle of exchangeable market values wherever possible. In some cases, there are market prices used (such as for hydroelectric and timber resources) but for others complex modelling is required to estimate ecosystem service values (as in the case of forests and mangroves). **2. Final renewable natural capital equation** Once the above methodology is applied, there is a value for renewable natural capital in chained US$ for a given base year. The base year for the latest CWON will be 2019. Therefore, we have a value of renewable natural capital in chained 2019 US$ (which is similar to the concept of constant dollars). The series is divided by the population for each country and to give a renewable natural capital per capita series. A country contributes positively to the indicator if the following rule is met: $$Renewable\ natural\ capital\ per\ capita_t - Renewable\ natural\ capital\ per\ capita_{t_{t-3}} > 0$$ The time period of 3 years is chosen, as this is historically how regularly the data has been updated and because a time period longer than 1 year is likely to allow more insightful variation in the indicator. Hence this indicator will report in 2024, data from 2016-2019, in 2025, data from 2017-2020 and so on.
METHOD OF CALCULATION (DISAGGREGATION)	The data are reported at country level and can be aggregated to any country groupings or subsets (e.g., Regions, FCS, or Income Levels) as required.
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