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QI4SD

Summary of QI4SD Index 2024 Outcomes: Key Trends

SUPPORTING SUSTAINABLE DEVELOPMENT GOALS WITH QUALITY INFRASTRUCTURE

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1.
SUMMARY

The 2024 edition of the Quality Infrastructure for Sustainable Development (QI4SD) Index, developed by UNIDO, provides a comprehensive assessment of how countries' Quality Infrastructure (QI) systems contribute to achieving the Sustainable Development Goals (SDGs). Covering 155 countries, this updated index evaluates national QI readiness through five core dimensions: metrology, standards, accreditation, conformity assessment, and quality policy, mapped across the SDG-linked dimensions of People, Planet, and Prosperity.

Key findings reveal a strong correlation between a country's QI system and its economic scale, with larger economies typically achieving higher QI scores. However, exceptions exist, with several smaller economies performing well above expectations, demonstrating the impact of strategic QI investment. The Index also introduces three specific "P-indexes" (People, Planet, and Prosperity) to allow targeted insights into QI's role in each sustainable development dimension. The data shows consistency across these dimensions, suggesting that countries with robust QI support across one SDG area often excel in others as well.

While challenges around data availability and alignment remain, this edition includes methodological refinements and feedback from a broad range of stakeholders, setting a strong foundation for future iterations. The QI4SD Index underscores that Quality Infrastructure is a powerful driver of sustainable development, offering countries a valuable framework for benchmarking their progress and fostering resilience and prosperity.

2.
INTRODUCTION

Nearly a decade has passed since the United Nations introduced the Sustainable Development Goals (SDGs) in 2015, setting the framework for global efforts towards a sustainable and equitable future. These 17 goals span social, economic, and environmental priorities, aiming to address the pressing challenges of our time. Integral to realising these ambitions is Quality Infrastructure (QI), which comprises a country's system of standards, regulations, and oversight. QI ensures that products and services meet internationally recognised quality and safety requirements, supporting vital aspects of sustainable development, such as international trade, innovation, consumer protection, and environmental sustainability efforts.

The United Nations Industrial Development Organisation (UNIDO) plays a crucial role in advancing QI, particularly in developing economies, to support countries' progress towards the SDGs. Recognising the need for a targeted tool to assess and guide QI improvements globally, UNIDO introduced the Quality Infrastructure for Sustainable Development (QI4SD) Index in 2022. This index serves as a comprehensive framework, bringing together multiple indicators that evaluate the readiness of national QI systems to contribute to sustainable development goals. Rather than measuring sustainable development directly, the QI4SD Index assesses how effectively QI systems support the SDGs, allowing countries to track progress and focus interventions.

The QI4SD Index uses a composite indicator approach, integrating key QI dimensions: metrology, standardisation, conformity assessment, accreditation, and quality policy. Each of these areas is essential to building a reliable QI system, enabling countries to engage in international trade, foster consumer trust, and support environmental objectives. Moreover, these dimensions are mapped to SDG priorities in the areas of Prosperity, People, and Planet, highlighting how QI systems underpin sustainable development efforts across different sectors. Through this structure, the index allows for cross-country comparisons, identification of strengths and gaps, and evidence-based planning.

In November 2024, UNIDO launched the second version of the QI4SD Index, which includes updates to reflect new data and improved methodologies. This release features an overview report to introduce the revised index and present initial findings. A more comprehensive set of documents, including the full report, detailed methodology, and country-specific profiles, will be published in early 2025. This expanded dataset and refined approach provides governments, industry stakeholders, and international organisations with a valuable resource for benchmarking QI readiness, formulating strategies, and strengthening global alignment on sustainable development.

3.

METHODOLGY OVERVIEW FOR QI4SD INDEX 2024

The QI4SD Index methodology, established in 2022, is based on an internationally recognised approach for constructing composite indicators, following the Joint Research Centre (JRC) and OECD Handbook on Composite Indicators (2008). This methodology provides a systematic means to evaluate a country's Quality Infrastructure (QI) readiness in supporting the United Nations Sustainable Development Goals (SDGs) by mapping QI indicators across key sustainable development priorities.

3.1
CONCEPTUAL FRAMEWORK

The QI4SD Index is structured around five core dimensions of QI:

» Accreditation: Certification and formal recognition of conformity assessment bodies (CABs)

» Conformity Assessment: Covers certification, testing, and inspection to confirm adherence to standards

» Metrology: Encompasses scientific, industrial, and legal metrology to ensure accurate measurements

» Policy: Represents government actions to support and integrate QI within national frameworks

» Standards: Includes technical regulations and voluntary standards

These dimensions align with the three "P-dimensions" of sustainable development (People, Planet, and Prosperity) to create a matrix framework. Figure 1 illustrates the conceptual framework. This framework enables the QI4SD Index to assess QI's contributions to SDGs. Two main types of indicators are used:

» P-indicators: Indicators that directly measure the interaction of QI dimensions with SDG-related activities. For example, environmental standards in a country are mapped to the Planet dimension.

» General Indicators: Indicators that measure QI but do not directly map to SDGs, such as the number of accredited labs or national QI policies. These indicators capture foundational QI activities but are not directly linked to specific sustainable development dimensions.

This framework allows for a comprehensive assessment of QI's contributions to sustainable development while maintaining flexibility where specific data are not available.

3.2
INDICATOR SELECTION AND DATA COLLECTION

An iterative process was employed to select indicators, involving consultations with QI organisations, input from international experts, and feedback from workshops. The indicator selection process began with an initial list drawn from UNIDO expertise, existing surveys, and literature. This list was refined through discussions with INetQI and international QI experts, resulting in a set of indicators suitable for the first index edition in 2022. For the 2024 edition, feedback from a dedicated workshop in Riyadh and an expert group meeting in Vienna in October and November 2023, along with bilateral meetings with INetQI organisations from March to May 2024, led to some refinements. The indicator set expanded slightly from 36 to 38 indicators, with updated data from new sources where available.

FIGURE 1: QI4SD Index conceptual framework
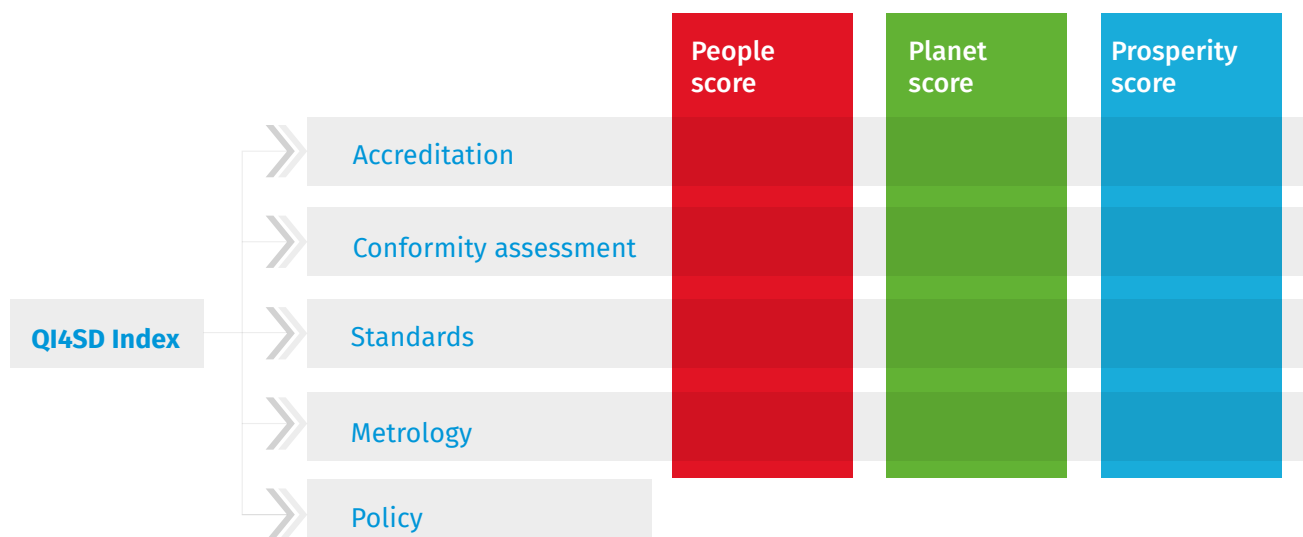
Key data sources include:

» Data from INetQI organisations: Both public and non-public databases from QI organisations, ensuring comprehensive, high-quality data coverage.

» UNIDO survey data: This data, collected through a targeted survey, is especially crucial for an area where centralised QI data is not available, such as the Policy dimension.

The data cleaning and processing pipeline was established in R using Quarto notebooks (Automated Data Processing), ensuring fully reproducible and transparent data workflows. For the 2024 edition, each QI dimension was evaluated in consultation with international QI experts to validate indicators and ensure that all data processing decisions met quality standards.

3.3

DATA PROCESSING AND STATISTICAL ANALYSIS

Once collected, data underwent statistical analysis to address outliers, missing values, and scaling, ensuring consistent aggregation. Data was processed in R with specific attention to transparency and reproducibility. Key data processing steps included:

Outlier Treatment: Outliers were addressed following a fairly standard procedure, outliers were detected using a skew/kurtosis rule: if the absolute skew exceeded 2, and the kurtosis exceeded 3.5, the indicator was treated by successively Winsorising points (a technique that adjusts extreme values to reduce their influence without removing them from the dataset) up to a limit, followed by a nonlinear (log) transformation if necessary.

This step was essential for ensuring that aggregation results were not skewed by a few high or low values.

Normalisation: All indicators were scaled to a [1, 100] range using the min-max method. This standardisation

step allows indicators with different units or scales to contribute equally to the final Index scores. Scaling to a minimum value of 1 (instead of 0) avoids any misleading interpretation that a country has no capacity in a particular QI area.

Weighting and Aggregation: Indicators were aggregated into QI dimension scores (e.g., Standards, Metrology), and then into the overall QI4SD Index score. A weighted arithmetic mean was applied with generally equal weighting, as diverse stakeholders have varying perspectives on indicator importance. In cases where indicator-specific weights were necessary, detailed explanations are provided in the Methodological Annex.

Data Availability Requirements: For any QI dimension, a country's score was only calculated if at least 60% of the relevant indicators were available, ensuring that each dimension was robustly represented. The overall Index score similarly required 60% coverage across QI dimensions to include a country in the final results.

3.4

UPDATES TO INDICATORS IN THE 2024 EDITION

The 2024 edition includes several refinements based on feedback and updated data sources. Key changes by dimension are summarised below:

3.4.1 ACCREDITATION

The methodology for scoring countries within multi-economy accreditation bodies (ABs) was refined, ensuring countries within such ABs receive equivalent scores.

Feedback from ILAC and IAF clarified that the link between AB scopes and the 3P dimensions remains approximate, as no direct mapping could be achieved. This refinement improves consistency while acknowledging limitations in SDG-specific relevance. The list of indicators in the accreditation dimension is shown in Table 1.

TABLE 1: indicators in the accreditation dimension

ACCREDITION			
Indicator name	**Unit**	**Organisation**	**Type**
Scopes of IAF accreditation bodies **mapped to the 3Ps**	Number	IAF	G and P
Signatory to the IAF MLA	Yes/no	IAF	G
Scopes of ILAC accreditation bodies **mapped to the 3Ps**	Number	ILAC	G and P
Signatory to the ILAC MRA	Yes/no	ILAC	G

TABLE 2: indicators in the metrology dimension. Indicators that have been modified are highlighted in blue in the table

METROLOGY			
Indicator name	**Unit**	**Organisation**	**Type**
Participation in CIPM Consultative Committees	Number	BIPM	G
Participation in key and supplementary comparisons	Number	BIPM	G
Number of CMCs mapped to the 3Ps	Number	BIPM	G and P
Breadth of CMCs mapped to the 3Ps	Number of types	BIPM	G and P
Membership of BIPM	Categorical	BIPM	G
Membership of OIML	Categorical	OIML	G
OIML-CS - number of services offered	Number	OIML	G
Involvement in OIML project groups	Composite score	OIML	G

3.4.2 METROLOGY

Indicators from BIPM and OIML remained unchanged; proposed additions were found unfeasible within the current data collection scope. Notably, OIML Certification System (OIML-CS) indicators now score countries as "issuers" (2 points) or "recognisers" (1 point), reflecting a more nuanced assessment of metrology engagement.

The indicators continue to map to broad SDG dimensions (People, Planet, Prosperity) rather than specific SDGs due to data limitations. The list of indicators in the metrology dimension is shown in Table 2, where changes are highlighted in blue.
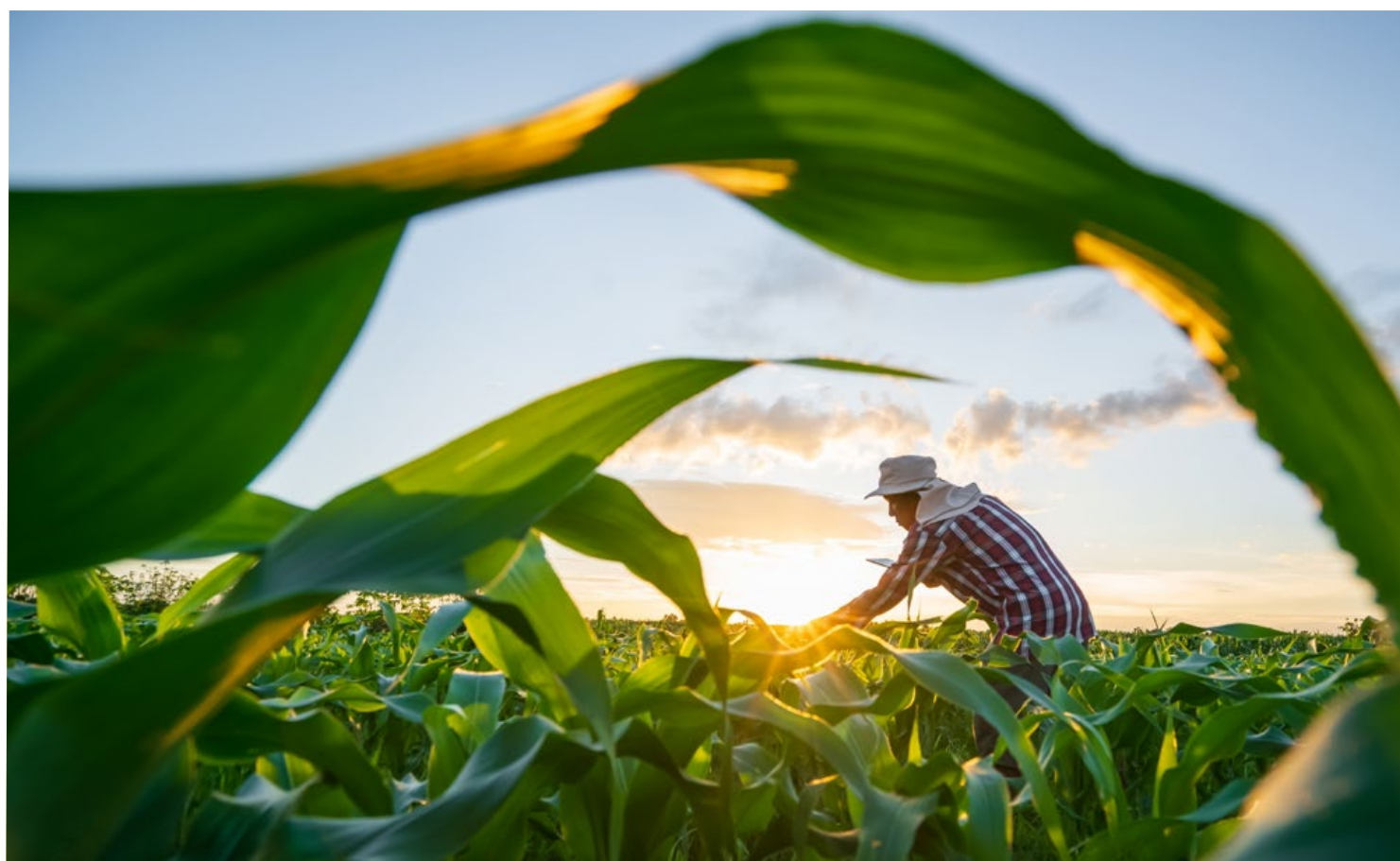
3.4.3 STANDARDS

Refinements were made to ISO, IEC, and ITU indicators, especially for SDG mapping. ISO standards and technical committee participation indicators now directly link to the 3P dimensions based on ISO's SDG mapping.

ITU data was limited to Standardization (T) membership, excluding Radiocommunication (R) and Development (D) categories. A new UNIDO-ISO survey indicator on national standards adoption further strengthens the standards dimension. The indicators in the standards dimension are illustrated in Table 3. Indicators that have been modified are highlighted in blue in the table.

3.4.4 CONFORMITY ASSESSMENT

IQNet membership calculations were revised to avoid duplicate counts, and three indicators from the Global Quality Infrastructure Index (GQII) framework were added to cover accredited laboratories and inspection bodies.

The ISO-recognised certificates indicator now uses an ISO mapped SDG score for each certificate type, providing a clearer link between conformity assessment and SDG relevance. The indicators for the conformity assessment dimension are shown in Table 4, with modifications highlighted in blue.

TABLE 3: indicators in the standards dimension. Indicators that have been modified are highlighted in blue in the table

STANDARDS			
Indicator name	**Unit**	**Organisation**	**Type**
Adopted ISO standards **mapped to the 3Ps**	Number	ISO	G and P
Adopted IEC standards **mapped to the 3Ps**	Number	IEC	G and P
Membership of IEC	Categorical	IEC	G
Participation in IEC technical committees **mapped to the 3Ps**	Number	IEC	G and P
Membership of ISO	Categorical	ISO	G
Participation in ISO technical committees **mapped to the 3Ps**	Number	ISO	G and P
Membership of ITU	Composite score	ITU	G
Adopted national standards	Number	UNIDO-ISO Survey	G

TABLE 4: indicators in the conformity assessment dimension. Indicators that have been modified are highlighted in blue in the table

CONFORMITY ASSESSMENT			
Indicator name	**Unit**	**Organisation**	**Type**
Membership of IEC conformity assessment systems	Score	IEC	G
Number of IECEE certificates recognised	Number	IEC	G
Membership of IQNet	Composite score	IQNet	G
Number of recognised certificates (ISO) mapped to the 3Ps	Number	ISO	G and P
Accredited laboratories	Number	GQII	G
Accredited inspection bodies	Number	GQII	G
Accredited bodies in other countries	Number	GQII	G

TABLE 5: indicators in the quality policy dimension. Indicators that have been modified are highlighted in blue in the table

POLICY			
Indicator name	**Unit**	**Organisation**	**Type**
Participation in capacity building programmes	Number of types	UNIDO-ISO Survey	G
Quality Policy in place	Categorical	UNIDO-ISO Survey	G
Dimensions of QI addressed by Quality Policy	Number	UNIDO-ISO Survey	G
Support and funding for Quality Policy	Yes/no	UNIDO-ISO Survey	G
Government/political endorsement for Quality Policy	Yes/no	UNIDO-ISO Survey	G
Stakeholder involvement of Quality Policy	Number	UNIDO-ISO Survey	G
Consideration of diversity in Quality Policy	Yes/no	UNIDO-ISO Survey	G
Implementation plan for Quality Policy	Categorical	UNIDO-ISO Survey	G
Monitoring and evaluation for Quality Policy	Yes/no	UNIDO-ISO Survey	G
Reviewing and updating for Quality Policy	Yes/no	UNIDO-ISO Survey	G
Quality Policy addresses Economy/Traderelated ("Prosperity"), Environmental ("Planet"), Social ("People") issues	Number	UNIDO-ISO Survey	G

3.4.5 POLICY

The UNIDO-ISO survey provides 11 indicators on QI policy, with expanded response options to capture detailed engagement across stakeholder groups and policy dimensions. For example, policies can now be categorised by economic, social, and environmental objectives, aligning them more closely with the 3P dimensions. The list of indicators in the policy dimension is shown in Table 5, where changes are highlighted in blue.

The indicators included in the general index, and the three P-indexes, are listed in the Appendix: List of Indicators.

3.5

CONSTRUCTION OF THE QI4SD INDEX

With the finalised indicators, the Index was constructed using the following steps:

Normalisation: Each indicator was scaled to fit a [1, 100] range, allowing them to contribute proportionally to the Index without bias from unit differences.

Aggregation: QI dimension scores were calculated using weighted arithmetic means for each category (Standards, Metrology, Accreditation, etc.). The overall QI4SD Index score was then derived by aggregating these dimension scores. Generally, equal weighting was applied, except in a few cases where half-weights were deemed necessary, **Threshold Requirements:** Each country's score was calculated only if it had at least 60% data coverage within each QI dimension, ensuring comprehensive data representation across the Index.

3.6

COUNTRY COVERAGE AND ANALYSIS BY SUSTAINABLE DEVELOPMENT DIMENSIONS (P-DIMENSIONS)

The 2024 QI4SD Index includes 155 countries, compared to 137 screened countries in the first version of the index. Countries with less than 60% data availability or with more than two-thirds zero values were excluded to ensure data quality. Each country's QI readiness is also assessed across the sustainable development dimensions:

People: Indicators related to health, education, and societal well-being. Examples include standards for medical laboratories and certification in food safety.

Planet: Indicators focused on environmental sustainability efforts, such as accreditation for environmental testing labs and adoption of environmental standards.

Prosperity: Indicators that support economic growth, including those related to trade facilitation and industrial metrology.

Four indexes are available in the QI4SD framework:

»   General Index: Combines all indicators, providing an overall assessment of a country's QI system.

»   People Index: Includes only P-indicators linked to societal outcomes, measuring contributions to social SDGs.

»   Planet Index: Focuses on environmental indicators, showing QI's role in achieving environmental goals.

»   Prosperity Index: Evaluates economic indicators relevant to trade, innovation, and industry.

The three P-indexes allow for detailed insights into QI's role in specific sustainable development areas, supporting targeted policymaking.

4.

KEY FINDINGS AND INSIGHTS

The QI4SD Index provides a comprehensive dataset organized into four composite indicators, each offering insights into specific aspects of Quality Infrastructure (QI). This section delves into the data, highlighting key findings from the study.

The data shows a strong correlation between QI and the economic scale of a country: larger economies generally achieve higher QI scores across all dimensions, except for Policy.

High QI4SD Index scores are predominantly seen in countries with high GDP, reflecting a reciprocal relationship between economic prosperity and QI development.

China ranks highest globally on the overall QI4SD Index, while Germany leads in the "3P" indexes: People, Planet, and Prosperity.

4.1 QI4SD INDEX 2024 INSIGHTS

Quality Infrastructure (QI) is closely connected to economic development: robust QI systems can drive economic output, enhancing productivity, innovation, and trade. At the same time, building and maintaining comprehensive QI systems requires significant investment, which larger economies are better positioned to afford. This relationship is evident in Figure 2, where the highest QI scores are seen in the world's largest economies, such as China, Germany, France, and the United States.

However, comparing all countries in a single ranking can obscure important nuances. Larger economies naturally tend to score higher in the QI4SD Index due to their greater resources and established infrastructure, while smaller or developing economies may face unique challenges. To provide more meaningful insights, it is more effective to evaluate countries within peer groups, allowing for comparisons among nations with similar economic profiles. In the following section, countries will be grouped according to GDP levels, offering a framework that considers economic scale in interpreting QI scores. This peer group approach provides a clearer picture of QI strengths and areas for growth, facilitating targeted comparisons and supporting context-specific analysis.

It is more meaningful to present scores by grouping countries into peer categories. Four GDP-based groups, derived from 2023 GDP World Bank values, are defined as follows:

S: Below USD 10 billion

M: Between USD 10–100 billion

L: Between USD 100 billion–1 trillion

XL: Above USD 1 trillion

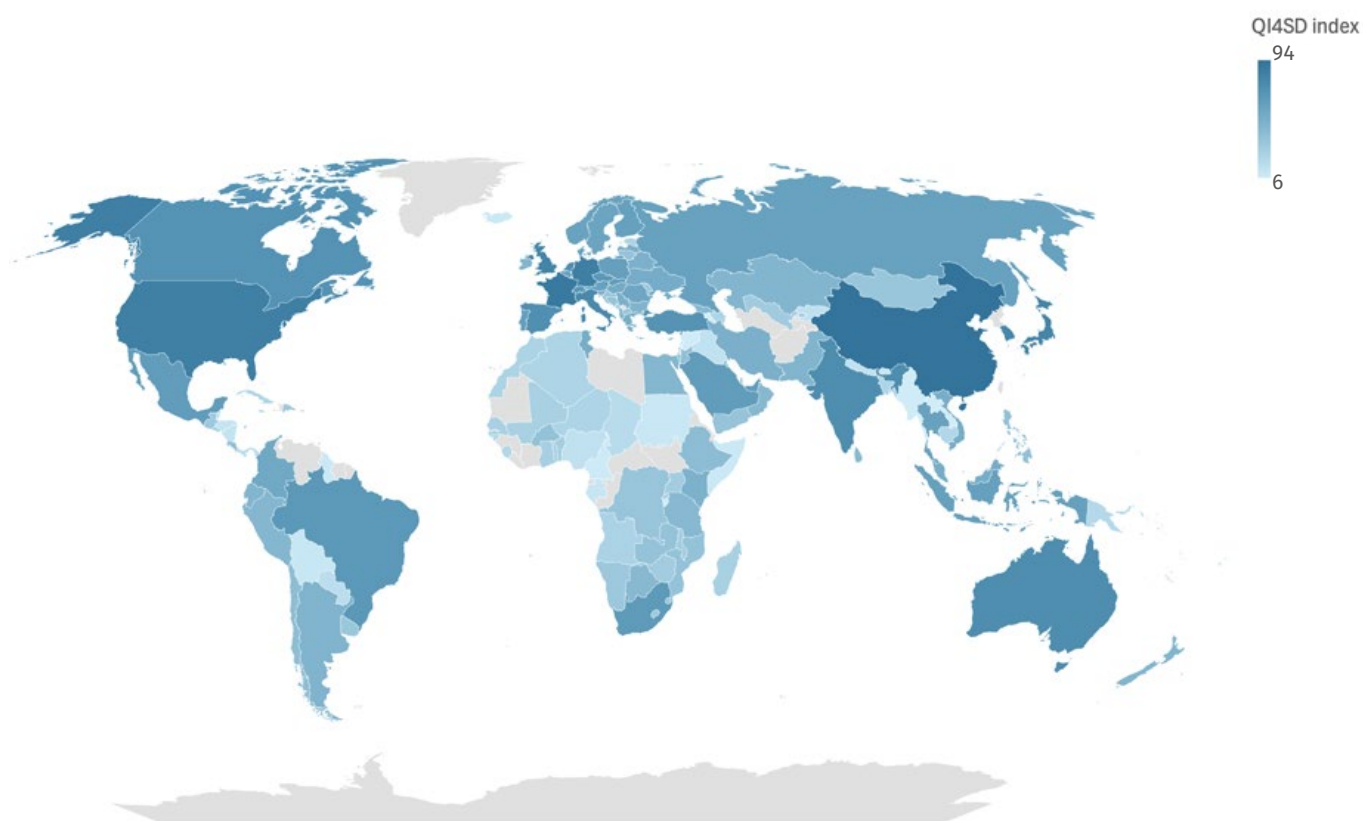**FIGURE 2:** QI4SD Index 2024 scores

Table 1 presents the results for the XL group. The XL-group contains 19 countries, three more than in the first edition (the Netherlands, Saudi Arabia and Turkey). According to the QI4SD Index, China ranks as having the highest level of quality infrastructure globally, followed by France, Germany, the USA, and the UK. Among the top ten countries, four are European (Germany, France, the UK, and Italy), four are from the East Asia and Pacific region (China, Japan, South Korea, and Australia), one is from South Asia (India), and one is from North America (the USA).

China holds the highest global scores in standards and conformity assessment. This is due, in part, to factors such as China's high number of adopted ISO standards, significant involvement in ISO and IEC Technical Committees (TC), leading participation in ITU, and its large number of adopted national standards. In conformity assessment, China also ranks highest in recognised ISO certificates and accredited laboratories. Within the XL group, China, along with Indonesia, achieved the highest scores in the policy dimension, as measured by the UNIDO/ISO survey.

France, in second place, has strong scores across all dimensions, achieving the maximum score in accreditation alongside Germany and seven[1] other countries in the XL group. Germany, in third place, holds the highest global score in metrology but has a low score in the Policy dimension, the lowest within the XL group.

Some countries have missing data in the Policy dimension. A Policy score is calculated only when at least 60% of its indicators have available data. Because the Policy dimension relies on responses from the UNIDO/ISO survey, missing data occurs for countries that either did not participate in the survey or did not answer the Policy-related questions. The overall index rankings for these countries should be interpreted with some caution, as they are based on scores from only four dimensions instead of five. In the XL group, countries such as the USA, Japan, South Korea, the Netherlands, and Mexico did not respond to the UNIDO/ISO survey.

TABLE 6: QI4SD index scores for countries in XL group (grey boxes indicate missing data)

Country	Region	Rank	Index	Standards	Conformity	Metrology	Accreditation	Policy
China	East Asia & Pacific	1	94	88	92	96	94	100
France	Europe & Central Asia	2	89	83	81	92	100	91
Germany	Europe & Central Asia	3	85	85	83	100	100	57
United States	North America	4	85	72	78	90	100	
United Kingdom	Europe & Central Asia	5	82	85	70	92	100	62
Japan	East Asia & Pacific	6	81	84	50	94	94	
South Korea	East Asia & Pacific	7	79	82	56	83	96	
Italy	Europe & Central Asia	8	78	84	71	77	100	58
India	South Asia	9	75	70	57	65	100	84
Australia	East Asia & Pacific	10	75	50	61	81	94	86
Netherlands	Europe & Central Asia	11	74	77	38	81	100	
Spain	Europe & Central Asia	12	74	78	61	63	100	66
Canada	North America	13	71	61	34	73	92	96
Turkey	Europe & Central Asia	14	71	55	55	64	100	79
Brazil	Latin America & Caribbean	15	67	47	54	66	88	81
Saudi Arabia	Middle East & North Africa	16	64	54	49	44	79	95
Mexico	Latin America & Caribbean	17	64	46	61	54	94	
Indonesia	East Asia & Pacific	18	61	38	31	39	96	100
Russia	Europe & Central Asia	19	60	78	16	90	46	70

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[1] USA, UK, Italy, India, the Netherlands, Spain and Turkey.

TABLE 7: QI4SD index scores for countries in L group (grey boxes indicate missing data; truncated to top 20)

Country	Region	Rank	Index	Standards	Conformity	Metrology	Accreditation	Policy
Switzerland	Europe & Central Asia	1	69	70	28	79	86	82
Czechia	Europe & Central Asia	2	68	60	35	77	100	
South Africa	Sub-Saharan Africa	3	66	47	46	75	94	66
Slovakia	Europe & Central Asia	4	64	46	15	72	96	92
United Arab Emirates	Middle East & North Africa	5	64	45	55	33	86	100
Portugal	Europe & Central Asia	6	62	54	26	44	92	96
Singapore	East Asia & Pacific	7	62	36	41	45	90	98
Poland	Europe & Central Asia	8	62	57	33	57	100	
Finland	Europe & Central Asia	9	61	60	16	53	96	81
Denmark	Europe & Central Asia	10	61	67	18	60	100	
Austria	Europe & Central Asia	11	60	54	32	54	92	70
Belgium	Europe & Central Asia	12	60	71	23	46	100	
Thailand	East Asia & Pacific	13	60	44	27	53	100	75
Norway	Europe & Central Asia	14	60	55	17	40	100	86
Sweden	Europe & Central Asia	15	58	71	32	65	96	28
Romania	Europe & Central Asia	16	57	56	28	44	96	59
Colombia	Latin America & Caribbean	17	55	37	29	44	79	87
Hungary	Europe & Central Asia	18	53	49	23	45	96	
Ukraine	Europe & Central Asia	19	52	49	23	50	86	
Malaysia	East Asia & Pacific	20	52	49	38	29	90	51

Table 2 presents the scores of the top twenty countries in the L group (GDP between USD 100 billion and 1 trillion), with the remaining countries omitted for brevity (full rankings can be found in the Appendix: Results Tables). This group includes many medium-sized European countries, with Switzerland and Czechia ranking at the top. However, Czechia lacks a score in the Policy dimension due to missing data.

Other countries in the L group include South Africa, the highest-ranking African country, in third place, and the United Arab Emirates, the second highest-ranking country in the Middle East, with only Saudi Arabia in the XL group achieving a slightly higher score.

TABLE 8: QI4SD index scores for countries in M group, (grey boxes indicate missing data, truncated to top 20)

Country	Region	Rank	Index	Standards	Conformity	Metrology	Accreditation	Policy
Tunisia	Middle East & North Africa	1	51	39	10	39	79	90
Serbia	Europe & Central Asia	2	50	44	26	41	90	
Slovenia	Europe & Central Asia	3	50	37	19	51	92	
Latvia	Europe & Central Asia	4	50	31	7	24	92	95
Belarus	Europe & Central Asia	5	49	38	28	39	46	93
Albania	Europe & Central Asia	6	45	38	3	24	71	86
Georgia	Europe & Central Asia	7	44	25	7	18	84	84
Botswana	Sub-Saharan Africa	8	44	27	15	16	79	79
Tanzania	Sub-Saharan Africa	9	43	26	2	24	79	85
Sri Lanka	South Asia	10	42	30	4	23	86	69
Jordan	Middle East & North Africa	11	38	30	3	8	73	77
Costa Rica	Latin America & Caribbean	12	37	28	15	27	79	
Burkina Faso	Sub-Saharan Africa	13	37	27	1	1	75	80
Zambia	Sub-Saharan Africa	14	36	34	1	31	79	
Mozambique	Sub-Saharan Africa	15	36	14	1	8	79	78
Bosnia & Herzegovina	Europe & Central Asia	16	36	28	9	19	42	83
Croatia	Europe & Central Asia	17	36	43	22	37	42	
Lithuania	Europe & Central Asia	18	36	26	7	26	86	
Yemen	Middle East & North Africa	19	36	14	1	1	79	84
Congo - Kinshasa	Sub-Saharan Africa	20	35	26	1	1	79	66

Table 3 displays the scores for the M group. While these scores are generally lower than those in the L and XL groups, the Policy scores are comparable and, in some cases, relatively high. Tunisia ranks at the top of the M group, alongside several higher-ranking Eastern European countries such as Serbia, Slovenia, and Latvia. These countries are often full members of major QI organizations, including ISO, IAF, and ILAC, but tend to have slightly lower scores on indicators like the number of recognized certificates and adopted standards—likely due to their smaller size.

Finally, Table 4 presents the scores for the S group (GDP below USD 10 billion). As expected, the overall scores are lower, with the notable exception of the policy dimension. The complete results tables can be found in the Appendix: Results Tables.
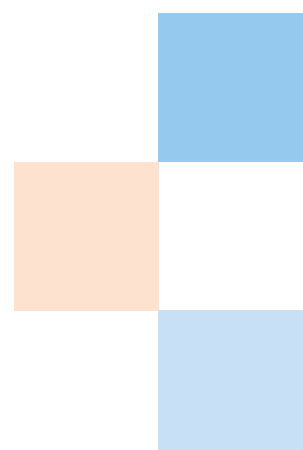
TABLE 9: QI4SD index scores for countries in S group (grey boxes indicate missing data)

Country	Region	Rank	Index	Standards	Conformity	Metrology	Accreditation	Policy
Seychelles	Sub-Saharan Africa	1	37	14	1	9	79	82
Eswatini	Sub-Saharan Africa	2	34	14	1	1	79	73
Lesotho	Sub-Saharan Africa	3	32	15	1	1	79	63
Montenegro	Europe & Central Asia	4	27	26	2	31	1	75
Togo	Sub-Saharan Africa	5	27	30	1	1	75	
Barbados	Latin America & Caribbean	6	26	20	1	16	1	90
Sierra Leone	Sub-Saharan Africa	7	22	15	1	8	1	83
Gambia	Sub-Saharan Africa	8	22	15	1	1	1	90
Guinea-Bissau	Sub-Saharan Africa	9	21	6	1	1	75	
Antigua & Barbuda	Latin America & Caribbean	10	19	10	1	8	1	77
St. Vincent & Grenadines	Latin America & Caribbean	11	16	13	1	8	1	54
Belize	Latin America & Caribbean	12	13	5	1	8	1	50
Bhutan	South Asia	13	11	18	1	1	1	32
St. Lucia	Latin America & Caribbean	14	10	23	1	15	1	
Fiji	East Asia & Pacific	15	8	22	1	8	1	
St. Kitts & Nevis	Latin America & Caribbean	16	8	20	1	8	1	
Burundi	Sub-Saharan Africa	17	7	25	1	1	1	
Syria	Middle East & North Africa	18	7	17	1	8	1	

4.1.1 QUALITY INFRASTRUCTURE: A CATALYST FOR ECONOMIC PROGRESS?

A country's prosperity is deeply interconnected with its economic development, which is driven by advancements in industry and infrastructure. For developing countries today, industrialisation is widely recognised as a vital pathway to economic growth, just as it was for now-developed countries in the past. Figure 3 illustrates the relationship between a country's GDP (X-axis) and its overall QI4SD Index score (Y-axis), revealing a strong linear association between Quality Infrastructure (QI) and the logarithm of GDP for the countries analysed. The linearity of the relationship, shown by the regression line in light blue, is enhanced by applying a logarithmic transformation to the GDP. This transformation simplifies the relationship into a straight line, rather than a curve, and enables further insight into the data through an analysis of residuals.

The correlation coefficient (r = 81%) indicates a robust association between QI and GDP, while the high coefficient of determination (R^2 = 65%) suggests that nearly two-thirds of the variance in QI4SD Index scores can be explained by GDP variance. Generally, countries with higher GDPs achieve higher QI4SD Index scores. However, this does not fully capture the complexity of the relationship. If GDP alone dictated QI levels, each country's data point would align exactly along the regression line; yet this is not the case. Residuals—the differences between the actual QI4SD Index scores and the values predicted by the line, highlight exceptions that reveal deeper insights.

Several countries demonstrate QI scores that exceed what their GDP alone would suggest, positioning them as **"QI overperformers."** In descending order, the top ten QI overperformers are Seychelles, Lesotho, Slovakia, France, Eswatini, Botswana, Tunisia, Czechia, Albania, Latvia, South Korea, and South Africa. These countries, shown in blue in Figure 8, illustrate that a country's QI can indeed outpace its economic scale, suggesting strategic development choices or prioritisation in QI domains.

Conversely, other countries, marked in orange in Figure 3, exhibit lower QI scores relative to their GDP. These **"QI underperformers"** include Nigeria, Iraq, Sudan, Myanmar, Bangladesh, Cameroon, Algeria, Bolivia, Armenia, Panama, Morocco, and Laos. Unlike the overperformers, underperformers are generally concentrated in the lower-middle GDP range, where QI development may not yet align with GDP growth.

The presence of these overperformers and underperformers across varying GDP levels invites reflection on the dynamics of QI and economic progress. On one hand, it can be argued that countries with higher GDPs inherently have greater capacity to invest

in QI infrastructure and systems, thanks to larger resource pools. Overperformers in this context are commendable for having prioritised QI, achieving higher standards than one might expect based solely on their economic scale.

Alternatively, the relationship can be viewed from the reverse perspective: GDP could, in theory, be bolstered by a strong QI system. This perspective would suggest that the observed "overperformance" in QI might actually indicate a comparatively lower-than-expected GDP, given their advanced QI. Rather than asking which drives which—whether GDP promotes QI development or QI stimulates GDP growth, this analysis suggests that both likely support and reinforce each other in a mutually beneficial cycle, fostering long-term progress and stability.

FIGURE 3: QI4SD Index 2024 scores vs GDP (current USD, 2022-2023 latest values). The regression line is in light blue. QI overperformers are in blue and QI underperformers are in orange.
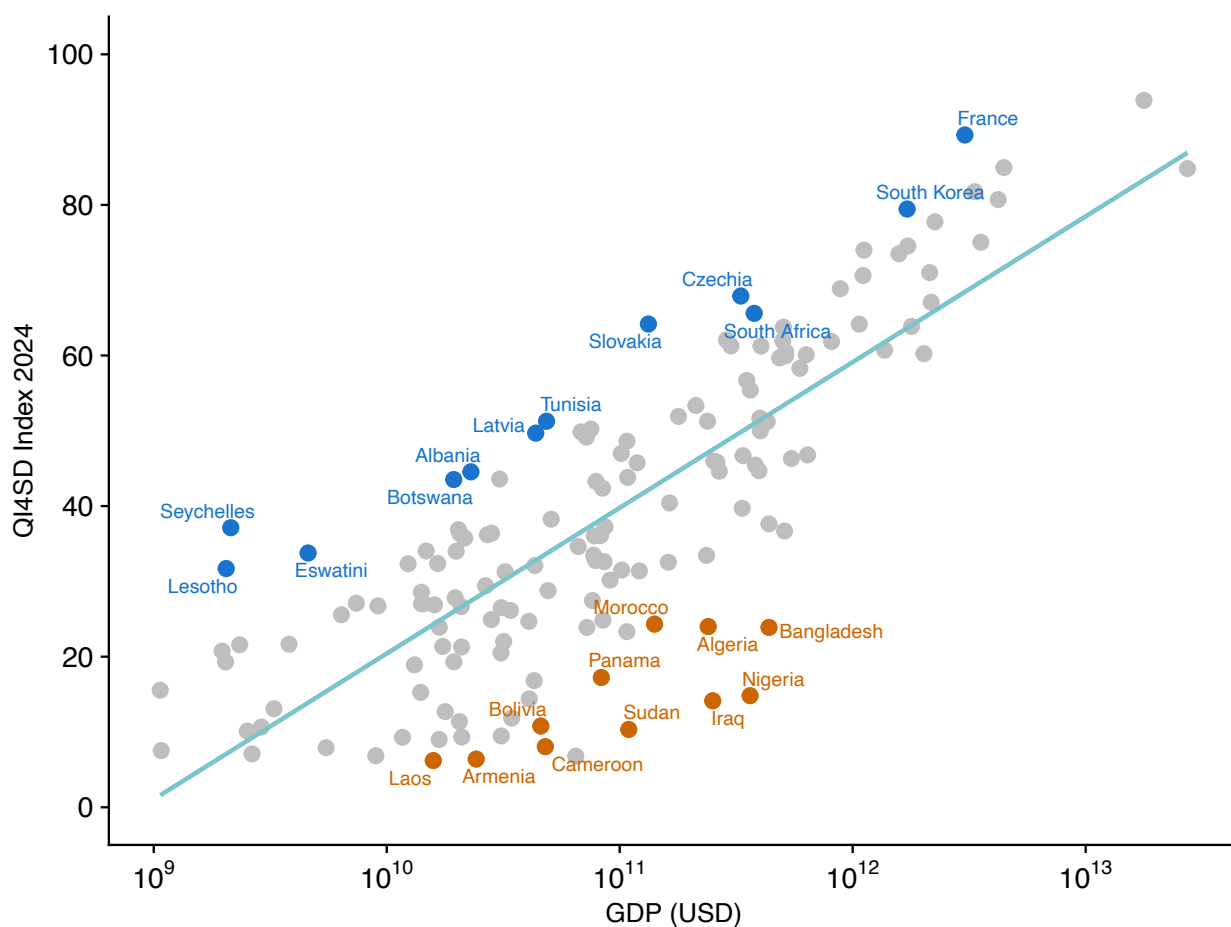
4.2

QUALITY INFRASTRUCTURE AND THE SDG CONNECTION: ANALYSING THE P INDEXES

Deconstructing Quality Infrastructure (QI) into components that address particular aspects of sustainable development is a challenging undertaking.

In the first version of the index, to tackle this, separate "P-indexes" for People, Planet, and Prosperity were developed. Each P-index includes a subset of indicators from the general index—those that could practically be linked to one of these three areas. Table 10 lists the indicators in the second edition, showing that nine indicators could be mapped to the 3Ps in this way. It is important to note that the P-indexes are not directly comparable to the general index discussed in the previous sections, as they are based on only a portion of the general index's indicators.

TABLE 10: Indicators included in each of the P-indexes

ACCREDITATION	CONFORMITY ASSESSMENT	METROLOGY	STANDARDS
Scopes of IAF accreditation bodies mapped to the 3Ps	Number of recognised ISO certificates mapped to the 3Ps	Number of CMCs mapped to the 3Ps	Adopted ISO standards mapped to the 3Ps
Scopes of ILAC accreditation bodies mapped to the 3Ps		Breadth of CMCs mapped to the 3Ps	Adopted IEC standards mapped to the 3Ps
			Participation in IEC technical committees mapped to the 3Ps
			Participation in ISO technical committees mapped to the 3Ps

Delving deeper into the results of the P indexes, Table11 to Table 14 display the P-ranks for the top ten countries in each GDP group (other countries are excluded for brevity; full rankings are available in the Appendix: Results Tables). One key observation is immediately clear, the data shows that countries tend to have similar ranks across all three Ps. This suggests that if a country performs well in the People category, it is likely also to perform well in Planet and Prosperity.

To take the XL group of countries as a first example (see Table 11), Germany has the highest rank in all three P-indexes. However, France ranks second in People and Planet, and fourth in Prosperity. Differences of this magnitude are likely not to be very significant.

TABLE 11: P-index ranks for XL GDP group countries (top 10)

Country	Region	People	Planet	Prosperity
Germany	Europe & Central Asia	1	1	1
France	Europe & Central Asia	2	2	4
United Kingdom	Europe & Central Asia	3	4	2
China	East Asia & Pacific	4	3	3
South Korea	East Asia & Pacific	5	6	6
Japan	East Asia & Pacific	6	5	7
United States	North America	7	7	8
Spain	Europe & Central Asia	8	8	9
Italy	Europe & Central Asia	9	10	5
Australia	East Asia & Pacific	10	12	12

Let us consider a case where P-ranks differ considerably in the XL group. Italy ranks fifth in Prosperity, but ninth in People and tenth in Planet. What is causing this difference?

When examining the underlying data, what is found is that Italy, in particular, has a lower score in metrology related to the People and Planet dimensions compared to Prosperity, largely due to a significantly lower number of calibration and measurement capabilities (CMCs) for People and Planet. Almost all of Italy's 443 CMCs are within the Prosperity dimension (99%). In contrast, Germany, the highest-ranked country across all P-indices, demonstrates a more balanced profile of CMCs, with 69% of its 1,393 CMCs allocated to the Prosperity dimension. Although P-scores and rankings are not strict measurements in themselves, they prompt further questions and exploration of the underlying data.

TABLE 12: P-index ranks for L GDP group countries (top 10)

Country	Region	People	Planet	Prosperity
Thailand	East Asia & Pacific	1	4	5
Czechia	Europe & Central Asia	2	1	1
Romania	Europe & Central Asia	3	3	4
Greece	Europe & Central Asia	4	16	19
Poland	Europe & Central Asia	5	2	2
Sweden	Europe & Central Asia	6	10	3
Finland	Europe & Central Asia	7	15	6
Austria	Europe & Central Asia	8	6	10
Denmark	Europe & Central Asia	9	12	11
South Africa	Sub-Saharan Africa	10	7	9

In the L group (Table 12), a similar pattern emerges, with rankings across the 3Ps showing general alignment. Czechia ranks highest in both the Planet and Prosperity indexes, while Thailand is leading the People index. In Thailand, of its 466 adopted ISO standards, 24% pertain to the People dimension. In contrast, Czechia, with 1,777 adopted ISO standards, allocates only 9% to the People dimension. This comparison highlights notable differences in the focus of standards adoption between these countries.

Shifting focus to the M and S groups of countries, shown in Table 13 and Table 14, similar patterns can be observed. Rankings across each of the 3Ps are generally aligned.

TABLE 13: P-index ranks for M GDP group countries (top 10)

Country	Region	People	Planet	Prosperity
Slovenia	Europe & Central Asia	1	2	2
Serbia	Europe & Central Asia	2	1	1
Belarus	Europe & Central Asia	3	3	3
Sri Lanka	South Asia	4	4	8
Latvia	Europe & Central Asia	5	6	7
Lithuania	Europe & Central Asia	6	9	6
Zambia	Sub-Saharan Africa	7	8	10
Uruguay	Latin America & Caribbean	8	5	5
Côte d'Ivoire	Sub-Saharan Africa	9	15	17
Botswana	Sub-Saharan Africa	10	11	21

TABLE 14: P-index ranks for S GDP group countries (top 10)

Country	Region	People	Planet	Prosperity
Togo	Sub-Saharan Africa	1	1	1
Eswatini	Sub-Saharan Africa	2	2	2
Seychelles	Sub-Saharan Africa	3	3	3
Lesotho	Sub-Saharan Africa	4	4	4
Guinea-Bissau	Sub-Saharan Africa	5	5	5
Bhutan	South Asia	6	8	8
St. Lucia	Latin America & Caribbean	7	7	9
Burundi	Sub-Saharan Africa	8	6	7
Montenegro	Europe & Central Asia	9	9	6
Barbados	Latin America & Caribbean	10	10	12

The linkages between Quality Infrastructure (QI) and sustainable development reveal valuable insights, drawing on mappings such as standards, technical committees, and detailed data on each country's involvement in these areas. These indicators represent the first effort to explicitly measure the overlap between QI and sustainable development. The raw data also offers valuable insights by breaking down individual indicators.

5. CONCLUSIONS

The second edition of the Quality Infrastructure for Sustainable Development (QI4SD) Index highlights the critical role that Quality Infrastructure (QI) plays in supporting sustainable development, linking national systems of standards, accreditation, metrology, conformity and policy frameworks to global goals. The expanded country coverage and refined methodology in this 2024 edition allow for deeper insights into how QI can drive progress across economic, social, and environmental dimensions.

Several key themes emerge from the 2024 data. First, the strong correlation between QI and economic scale underscores that larger economies are generally better positioned to invest in QI systems. However, the presence of QI "overperformers" and "underperformers" suggests that economic capacity is not the sole factor. Smaller countries (e.g. Slovakia and Botswana) demonstrate that strategic prioritisation in QI can yield substantial benefits even in smaller economies, while some larger economies underperform relative to their potential, highlighting opportunities for targeted improvements.

The use of the P-dimensions, People, Planet, and Prosperity, offers a nuanced view of QI's role in advancing specific Sustainable Development Goals (SDGs). The

consistency observed across these P-indexes indicates that countries performing well in one area of sustainable development often do so across others, reflecting the interdependence of economic, environmental, and social well-being. This alignment reinforces the value of a balanced approach to QI development, where investments in environmental standards and social protections complement economic growth objectives.

Challenges remain, particularly concerning data availability and alignment across diverse international standards and policies. The 2024 Index has made strides in addressing these gaps, yet future iterations will continue to refine indicators and incorporate feedback from a broader range of stakeholders. Through ongoing collaboration, the QI4SD Index aims to enhance its capacity to serve as a reliable benchmarking tool, guiding countries in aligning their QI systems with sustainable development goals.

Ultimately, the QI4SD Index illustrates the potential for Quality Infrastructure to act as a catalyst for sustainable growth, underscoring that investments in QI are investments in a country's long-term resilience and prosperity. By supporting countries to strengthen their QI frameworks, the index contributes to a global infrastructure that not only facilitates trade and innovation but also fosters a more inclusive and sustainable future for all.

APPENDIX: LIST OF INDICATORS
FULL QI4SD INDEX

	CONFORMITY ASSESSMENT				
	Indicator name	**Description**	**Unit**	**Organisation**	**Type**
1	Membership of IEC conformity assessment systems	Country membership in the four IEC conformity assessment systems (IECEE, IECEx, IECRE, IECQ), range 0 to 4.	Score	IEC	G
2	Number of IECEE certificates recognised	Number of IECEE certificates present in country.	Number	IEC	G
3	Membership of IQNet	Level of involvement in IQNet, location of head, subsidiary offices and origin of Certification Bodies.	Composite score	IQNet	G
4	Number of recognised certificates (ISO) mapped to the 3Ps	Number of recognised certificates from ISO database (ISO survey 2022) mapped into 3Ps.	Number	ISO	P and G
5	Accredited laboratories	Number of accredited laboratories according to; ISO/IEC 17025 (Calibration Laboratories), ISO/IEC 17025 (Testing Laboratories)and ISO 15189 (Medical Laboratories).	Number	GQII	G
6	Accredited inspection bodies	Number of accredited inspection bodies according to ISO/IEC 17020.	Number	GQII	G
7	Accredited bodies in other countries	Number of accredited laboratories according to ISO/IEC 17025 (Calibration Laboratories), ISO/IEC 17025 (Testing Laboratories) and ISO 15189 (Medical Laboratories) and number of accredited inspection bodies according to ISO/IEC 17020 present in other countries than the origin country.	Number	GQII	G

⊘ ACCREDITATION

	Indicator name	Description	Unit	Organisation	Type
1	Scopes of IAF accreditation bodies **mapped to the 3Ps**	Number of scopes for the IAF Multilateral Recognition Arrangement mapped into the 3Ps.	Number	IAF	P and G
2	Signatory to the IAF MLA	Existence of an accreditation body that is a signatory to the IAF Multilateral Recognition Arrangement.	Yes/no	IAF	G
3	Scopes of ILAC accreditation bodies **mapped to the 3Ps**	Number of scopes for the ILAC Mutual Recognition Arrangement mapped into the 3Ps.	Number	ILAC	P and G
4	Signatory to the ILAC MRA	Existence of an accreditation body that is a signatory to the ILAC Mutual Recognition Arrangement.	Yes/no	ILAC	G

⚖ METROLOGY

	Indicator name	Description	Unit	Organisation	Type
1	Participation in CIPM Consultative Committees	Sum of overall participation in ten Consultative Committees, range 0 to 20.	Number	BIPM	G
2	Participation in key and supplementary comparisons	Sum of the scores for the key and supplementary comparisons.	Number	BIPM	G
3	Number of CMCs **mapped to the 3Ps**	Total number of Calibration and Measurement Capabilities (CMCs) in any area mapped into 3Ps.	Number	BIPM	P and G
4	Breadth of CMCs **mapped to the 3Ps**	Total breadth of Calibration and Measurement Capability (CMC) types with at least one capacity mapped into 3Ps	Number of types	BIPM	P and G
5	Membership of BIPM	Membership of BIPM, range 0 to 2. Member State = 2 , Associate = 1,Neither = 0	Categorical	BIPM	G
6	Membership of OIML	Membership of OIML, range 0 to 2. Full member = 2, Corresponding member = 1, Neither = 0	Categorical	OIML	G

	Indicator name	Description	Unit	Organisation	Type
7	OIML-CS - number of services offered and recognised	The OIML Certification System (OIML-CS) indicators measure participation in the OIML-CS scheme, a score of 2 if a country is involved in OIML-CS as an issuer, 1 if it is a recogniser, and zero otherwise.	Categorical	OIML	G
8	Involvement in OIML project groups	Number of project groups for which each country is a convener (C), participating member (P) and observer (O).	Composite score	OIML	G

🔡 POLICY

	Indicator name	Description	Unit	Organisation	Type
1	Participation in capacity building programmes	Participated in capacity building programmes related to QI from BIPM, OIML, ISO, WTO in the last two years, range 0 to 4.	Number	UNIDO-ISO Survey	G
2	Quality Policy in place	National or regional Quality Policy in place, a policy for developing and sustaining effective QI. Yes (2): The element is fully present. Partial (1): Absent, but relevant regulations exist. No (0): Neither the element nor related regulations are present.	Categorical	UNIDO-ISO Survey	G
3	Dimensions of QI addressed by Quality Policy	QI dimensions (7 different (Metrology, Standardization, Technical Regulations, Accreditation, Conformity Assessment: Inspection, Testing and Calibration Laboratories, and Certification Bodies, Conformity Assessment: Validation and Verification Bodies and Market Surveillance) addressed by the Quality Policy or regulatory framework, range 0 to 7.	Number	UNIDO-ISO Survey	G
4	Support and funding for Quality Policy	Governmental support, including funding, stipulated in the Quality Policy or in the regulations and directions supporting QI.	Yes/no	UNIDO-ISO Survey	G
5	Government/political endorsement for Quality Policy	Development and implementation of the Quality Policy being endorsed by the political level or led by the highest level of government. Yes, by act of parliament or equivalent (1), Yes, approved at the ministerial level (1), No (0).	Yes/no	UNIDO-ISO Survey	G
6	Stakeholder involvement of Quality Policy	Involvement of stakeholders in the Quality Policy process from 7 different contributors (Public Sector, Private Sector, Consumers, Producers, NGOs, Academia and Research & Development Institutions), range 0 to 7.	Number	UNIDO-ISO Survey	G

7	Consideration of diversity in Quality Policy	Gender balance and other diversity aspects considered in the Quality Policy process.	Yes/no	UNIDO-ISO Survey	G
8	Implementation plan for Quality Policy	Presence of implementation plan for the national Quality Policy, i.e. a plan that sets out the steps for achieving the policy objectives. Yes, the policy is already in place (2), Yes, it's in the process of implementation (1), No (0).	Categorical	UNIDO-ISO Survey	G
9	Monitoring and evaluation for Quality Policy	Mechanism(s) for monitoring and/ or evaluating the implementation/ outcomes of the Quality Policy.	Yes/no	UNIDO-ISO Survey	G
10	Reviewing and updating for Quality Policy	Mechanism(s) for periodically reviewing and updating the Quality Policy.	Yes/no	UNIDO-ISO Survey	G
11	Quality Policy addresses Economy/Traderelated ("Prosperity"), Environmental ("Planet"), Social ("People") issues	The QP addresses Economy/Trade-related issues ("Prosperity") , Environmental issues ("Planet") , Social issues ("People") , range 0-3.	Number	UNIDO-ISO Survey	G

⬥ STANDARDS

	Indicator name	Description	Unit	Organisation	Type
1	Adopted ISO standards **mapped to the 3Ps**	Number of ISO standards that have been adopted and mapped into the 3Ps.	Number	ISO	P and G
2	Adopted IEC standards **mapped to the 3Ps**	Number of IEC standards that have been adopted and mapped into the 3Ps.	Number	IEC	P and G
3	Membership of IEC	Membership of the IEC, range 0 to 3.	Categorical	IEC	G
4	Participation in IEC technical committees **mapped to the 3Ps**	Number of IEC technical committees (TCs) participation mapped into the 3Ps.	Number	IEC	P and G
5	Membership of ISO	Membership of the ISO, range 0 to 3.	Categorical	ISO	G

6	Participation in ISO technical committees **mapped to the 3Ps**	Number of ISO technical committees (TCs) participation mapped into the 3Ps.	Number	ISO	P and G
7	Membership of ITU	Composite score of membership of ITU.	Composite score	ITU	G
8	Adopted national standards	Number of adopted national standards.	Number	UNIDO-ISO Survey	G

P-INDEXES

The following table shows the indicators included in the P-indexes. For each of these indexes, components of the indicators are only included that are relevant to the respective P. For example, for the People index, only the "People" component of adopted standards is included (i.e. the weighting of each standard that is relevant to People).

CONFORMITY ASSESSMENT

	Indicator name	Description	Unit	Organisation	Type
1	Number of recognised certificates (ISO) **mapped to the 3Ps**	Number of recognised certificates from ISO database (ISO survey 2022) mapped into 3Ps.	Number	ISO	P and G

ACCREDITATION

	Indicator name	Description	Unit	Organisation	Type
2	Scopes of IAF accreditation bodies **mapped to the 3Ps**	Number of scopes for the IAF Multilateral Recognition Arrangement mapped into the 3Ps.	Number	IAF	P and G
3	Scopes of ILAC accreditation bodies **mapped to the 3Ps**	Number of scopes for the ILAC Mutual Recognition Arrangement mapped into the 3Ps.	Number	ILAC	P and G

METROLOGY

	Indicator name	Description	Unit	Organisation	Type
4	Number of CMCs **mapped to the 3Ps**	Total number of Calibration and Measurement Capabilities (CMCs) in any area mapped into 3Ps.	Number	BIPM	P and G
5	Breadth of CMCs **mapped to the 3Ps**	Total breadth of Calibration and Measurement Capability (CMC) types with at least one capacity mapped into 3Ps	Number of types	BIPM	P and G

STANDARDS

	Indicator name	Description	Unit	Organisation	Type
6	Adopted ISO standards **mapped to the 3Ps**	Number of ISO standards that have been adopted and mapped into the 3Ps.	Number	ISO	P and G
7	Adopted IEC standards **mapped to the 3Ps**	Number of IEC standards that have been adopted and mapped into the 3Ps.	Number	IEC	P and G
8	Participation in IEC technical committees **mapped to the 3Ps**	Number of IEC technical committees (TCs) participation mapped into the 3Ps.	Number	IEC	P and G
9	Participation in ISO technical committees **mapped to the 3Ps**	Number of ISO technical committees (TCs) participation mapped into the 3Ps.	Number	ISO	P and G

APPENDIX: RESULTS TABLES

The full results tables (up to the dimension level) are given for each country, as well as P-ranks for each country. The full data set is available https://hub.unido.org/qi4sd/

GENERAL INDEX

TABLE 15: Index and dimension scores for XL group

Country	Region	Rank	Index	Standards	Conformity	Metrology	Accreditation	Policy
China	East Asia & Pacific	1	94	88	92	96	94	100
France	Europe & Central Asia	2	89	83	81	92	100	91
Germany	Europe & Central Asia	3	85	85	83	100	100	57
United States	North America	4	85	72	78	90	100	
United Kingdom	Europe & Central Asia	5	82	85	70	92	100	62
Japan	East Asia & Pacific	6	81	84	50	94	94	
South Korea	East Asia & Pacific	7	79	82	56	83	96	
Italy	Europe & Central Asia	8	78	84	71	77	100	58
India	South Asia	9	75	70	57	65	100	84
Australia	East Asia & Pacific	10	75	50	61	81	94	86
Netherlands	Europe & Central Asia	11	74	77	38	81	100	
Spain	Europe & Central Asia	12	74	78	61	63	100	66
Canada	North America	13	71	61	34	73	92	96
Turkey	Europe & Central Asia	14	71	55	55	64	100	79
Brazil	Latin America & Caribbean	15	67	47	54	66	88	81
Saudi Arabia	Middle East & North Africa	16	64	54	49	44	79	95
Mexico	Latin America & Caribbean	17	64	46	61	54	94	
Indonesia	East Asia & Pacific	18	61	38	31	39	96	100
Russia	Europe & Central Asia	19	60	78	16	90	46	70

TABLE 16: Index and dimension scores for L group

Country	Region	Rank	Index	Standards	Conformity	Metrology	Accreditation	Policy
Switzerland	Europe & Central Asia	1	69	70	28	79	86	82
Czechia	Europe & Central Asia	2	68	60	35	77	100	
South Africa	Sub-Saharan Africa	3	66	47	46	75	94	66
Slovakia	Europe & Central Asia	4	64	46	15	72	96	92
United Arab Emirates	Middle East & North Africa	5	64	45	55	33	86	100
Portugal	Europe & Central Asia	6	62	54	26	44	92	96
Singapore	East Asia & Pacific	7	62	36	41	45	90	98
Poland	Europe & Central Asia	8	62	57	33	57	100	
Finland	Europe & Central Asia	9	61	60	16	53	96	81
Denmark	Europe & Central Asia	10	61	67	18	60	100	
Austria	Europe & Central Asia	11	60	54	32	54	92	70
Belgium	Europe & Central Asia	12	60	71	23	46	100	
Thailand	East Asia & Pacific	13	60	44	27	53	100	75
Norway	Europe & Central Asia	14	60	55	17	40	100	86
Sweden	Europe & Central Asia	15	58	71	32	65	96	28
Romania	Europe & Central Asia	16	57	56	28	44	96	59
Colombia	Latin America & Caribbean	17	55	37	29	44	79	87
Hungary	Europe & Central Asia	18	53	49	23	45	96	
Ukraine	Europe & Central Asia	19	52	49	23	50	86	
Malaysia	East Asia & Pacific	20	52	49	38	29	90	51
Greece	Europe & Central Asia	21	51	40	32	37	96	
Vietnam	East Asia & Pacific	22	51	29	30	25	79	93
Iran	Middle East & North Africa	23	50	71	15	45	30	89
Kenya	Sub-Saharan Africa	24	49	39	21	41	73	69
Bulgaria	Europe & Central Asia	25	47	47	24	40	92	33
Argentina	Latin America & Caribbean	26	47	43	27	38	79	
Pakistan	South Asia	27	47	40	10	31	75	77
Ireland	Europe & Central Asia	28	46	49	11	36	90	
New Zealand	East Asia & Pacific	29	46	36	22	50	94	29
Kazakhstan	Europe & Central Asia	30	46	32	10	35	81	70
Ecuador	Latin America & Caribbean	31	46	29	7	24	79	89
Hong Kong SAR China	East Asia & Pacific	32	45	13	6	29	94	85
Egypt	Middle East & North Africa	33	45	45	17	42	90	30
Peru	Latin America & Caribbean	34	45	35	10	21	75	82
Oman	Middle East & North Africa	35	44	37	3	16	79	84
Ethiopia	Sub-Saharan Africa	36	40	36	2	22	79	62
Chile	Latin America & Caribbean	37	40	31	17	19	79	53
Philippines	East Asia & Pacific	38	38	41	6	24	79	
Israel	Middle East & North Africa	39	37	42	30	33	42	
Qatar	Middle East & North Africa	40	33	36	3	16	79	
Kuwait	Middle East & North Africa	41	33	33	2	16	79	
Guatemala	Latin America & Caribbean	42	32	19	4	8	42	83
Dominican Republic	Latin America & Caribbean	43	31	19	1	8	38	90
Morocco	Middle East & North Africa	44	24	31	3	31	1	55
Algeria	Middle East & North Africa	45	24	39	4	16	38	
Bangladesh	South Asia	46	24	35	3	16	42	
Cuba	Latin America & Caribbean	47	23	23	3	29	38	
Nigeria	Sub-Saharan Africa	48	15	43	6	9	1	
Iraq	Middle East & North Africa	49	14	31	2	23	1	
Sudan	Sub-Saharan Africa	50	10	31	1	8	1	

TABLE 17: Index and dimension scores for M group

Country	Region	Rank	Index	Standards	Conformity	Metrology	Accreditation	Policy
Tunisia	Middle East & North Africa	1	51	39	10	39	79	90
Serbia	Europe & Central Asia	2	50	44	26	41	90	
Slovenia	Europe & Central Asia	3	50	37	19	51	92	
Latvia	Europe & Central Asia	4	50	31	7	24	92	95
Belarus	Europe & Central Asia	5	49	38	28	39	46	93
Albania	Europe & Central Asia	6	45	38	3	24	71	86
Georgia	Europe & Central Asia	7	44	25	7	18	84	84
Botswana	Sub-Saharan Africa	8	44	27	15	16	79	79
Tanzania	Sub-Saharan Africa	9	43	26	2	24	79	85
Sri Lanka	South Asia	10	42	30	4	23	86	69
Jordan	Middle East & North Africa	11	38	30	3	8	73	77
Costa Rica	Latin America & Caribbean	12	37	28	15	27	79	
Burkina Faso	Sub-Saharan Africa	13	37	27	1	1	75	80
Zambia	Sub-Saharan Africa	14	36	34	1	31	79	
Mozambique	Sub-Saharan Africa	15	36	14	1	8	79	78
Bosnia & Herzegovina	Europe & Central Asia	16	36	28	9	19	42	83
Croatia	Europe & Central Asia	17	36	43	22	37	42	
Lithuania	Europe & Central Asia	18	36	26	7	26	86	
Yemen	Middle East & North Africa	19	36	14	1	1	79	84
Congo - Kinshasa	Sub-Saharan Africa	20	35	26	1	1	79	66
North Macedonia	Europe & Central Asia	21	34	27	6	24	79	
Mongolia	East Asia & Pacific	22	34	28	4	17	75	46
Uruguay	Latin America & Caribbean	23	33	30	7	30	71	28
Côte d'Ivoire	Sub-Saharan Africa	24	33	42	12	1	75	
Luxembourg	Europe & Central Asia	25	33	43	2	16	79	23
Moldova	Europe & Central Asia	26	32	30	2	18	79	
Namibia	Sub-Saharan Africa	27	32	23	1	26	79	
Bahrain	Middle East & North Africa	28	32	35	5	8	79	32
Cyprus	Europe & Central Asia	29	31	32	7	16	73	29
Uzbekistan	Europe & Central Asia	30	30	28	6	16	71	
Zimbabwe	Sub-Saharan Africa	31	29	28	2	9	79	
Uganda	Sub-Saharan Africa	32	29	38	1	16	1	88
Malawi	Sub-Saharan Africa	33	29	25	1	9	79	
Benin	Sub-Saharan Africa	34	28	27	1	8	75	
Ghana	Sub-Saharan Africa	35	27	40	1	16	1	80
Rwanda	Sub-Saharan Africa	36	27	36	1	16	1	82
Mauritius	Sub-Saharan Africa	37	27	26	1	16	65	
Madagascar	Sub-Saharan Africa	38	27	19	1	8	79	
Mali	Sub-Saharan Africa	39	27	22	1	8	75	
Senegal	Sub-Saharan Africa	40	27	29	1	1	75	
El Salvador	Latin America & Caribbean	41	26	19	2	1	38	71
Trinidad & Tobago	Latin America & Caribbean	42	25	22	1	16	1	84
Angola	Sub-Saharan Africa	43	25	11	1	8	79	
Estonia	Europe & Central Asia	44	25	28	5	24	42	
Niger	Sub-Saharan Africa	45	24	18	1	1	75	
Azerbaijan	Europe & Central Asia	46	24	19	4	17	1	78
Cambodia	East Asia & Pacific	47	22	26	1	30	30	
Palestinian Territories	Middle East & North Africa	48	21	20	1	1	1	84
Malta	Middle East & North Africa	49	21	30	2	16	1	58
Papua New Guinea	East Asia & Pacific	50	21	14	1	8	1	78

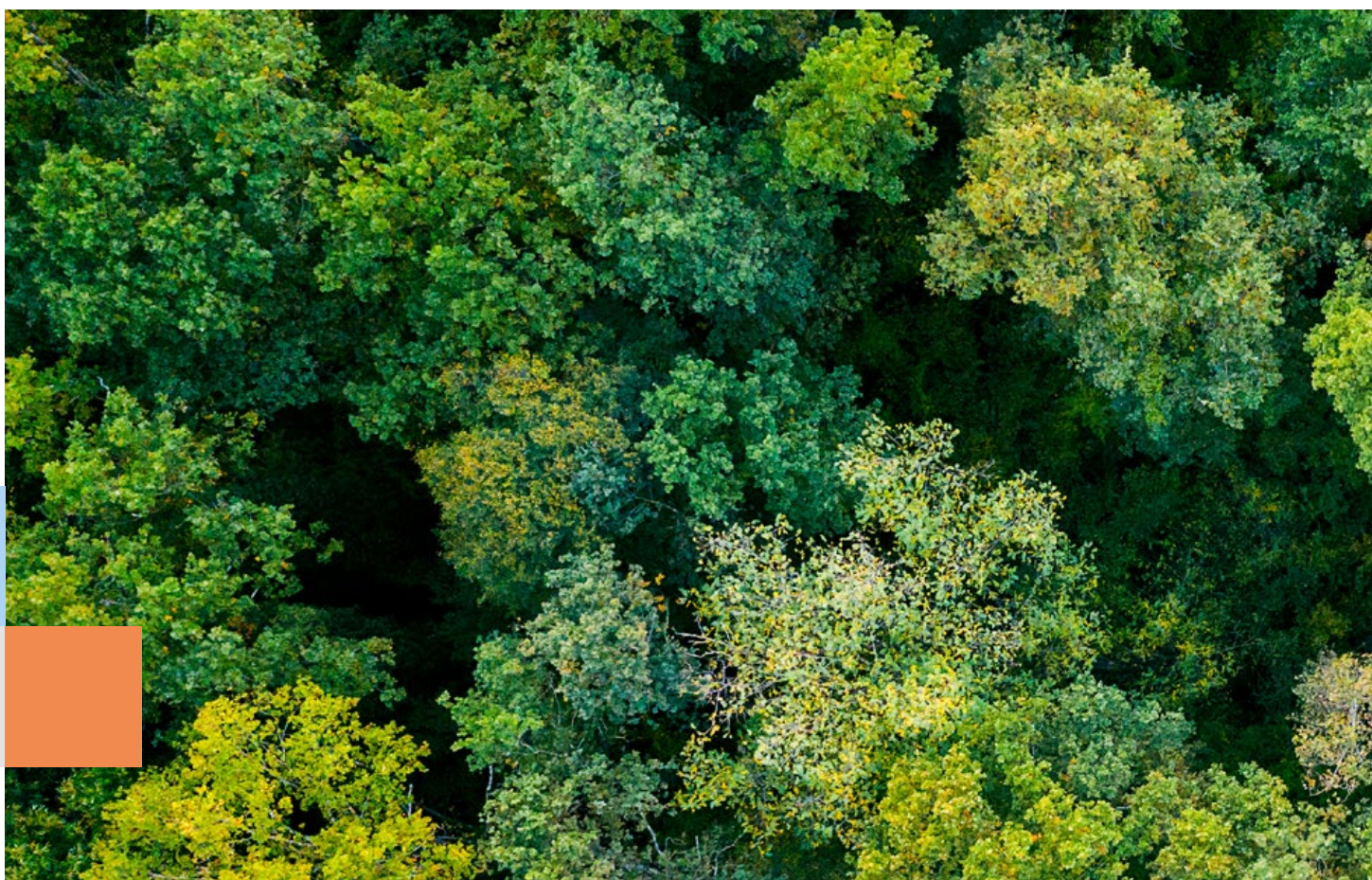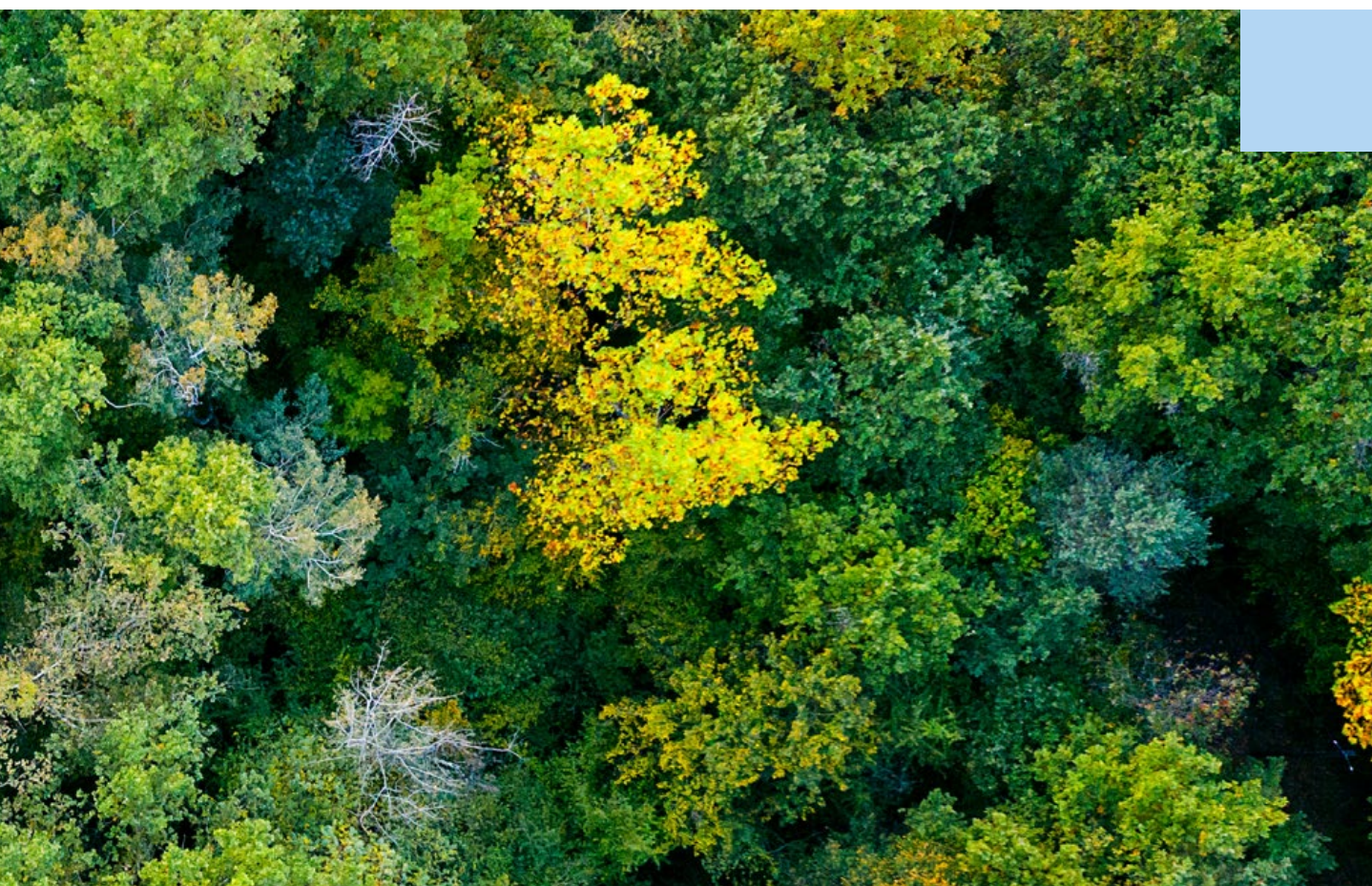| Country	Region	Rank	Index	Standards	Conformity	Metrology	Accreditation	Policy
Jamaica	Latin America & Caribbean	51	19	23	7	9	38	
Chad	Sub-Saharan Africa	52	19	15	1	1	1	76
Panama	Latin America & Caribbean	53	17	15	2	18	1	50
Paraguay	Latin America & Caribbean	54	17	15	2	17	34	
Kyrgyzstan	Europe & Central Asia	55	15	11	4	8	38	
Nepal	South Asia	56	14	19	1	8	1	42
Nicaragua	Latin America & Caribbean	57	13	10	1	1	38	
Honduras	Latin America & Caribbean	58	12	15	1	1	1	41
Gabon	Sub-Saharan Africa	59	11	35	1	8	1	
Bolivia	Latin America & Caribbean	60	11	22	3	17	1	
Iceland	Europe & Central Asia	61	9	27	2	8	1	
Lebanon	Middle East & North Africa	62	9	34	1	1	1	
Somalia	Sub-Saharan Africa	63	9	17	1	1	1	26
Guyana	Latin America & Caribbean	64	9	19	1	15	1	
Cameroon	Sub-Saharan Africa	65	8	29	1	1	1	
Myanmar (Burma)	East Asia & Pacific	66	7	24	1	1	1	
Armenia	Europe & Central Asia	67	6	22	2	1	1	
Laos	East Asia & Pacific	68	6	22	1	1	1	

TABLE 18: Index and dimension scores for S group

Country	Region	Rank	Index	Standards	Conformity	Metrology	Accreditation	Policy
Seychelles	Sub-Saharan Africa	1	37	14	1	9	79	82
Eswatini	Sub-Saharan Africa	2	34	14	1	1	79	73
Lesotho	Sub-Saharan Africa	3	32	15	1	1	79	63
Montenegro	Europe & Central Asia	4	27	26	2	31	1	75
Togo	Sub-Saharan Africa	5	27	30	1	1	75	
Barbados	Latin America & Caribbean	6	26	20	1	16	1	90
Sierra Leone	Sub-Saharan Africa	7	22	15	1	8	1	83
Gambia	Sub-Saharan Africa	8	22	15	1	1	1	90
Guinea-Bissau	Sub-Saharan Africa	9	21	6	1	1	75	
Antigua & Barbuda	Latin America & Caribbean	10	19	10	1	8	1	77
St. Vincent & Grenadines	Latin America & Caribbean	11	16	13	1	8	1	54
Belize	Latin America & Caribbean	12	13	5	1	8	1	50
Bhutan	South Asia	13	11	18	1	1	1	32
St. Lucia	Latin America & Caribbean	14	10	23	1	15	1	
Fiji	East Asia & Pacific	15	8	22	1	8	1	
St. Kitts & Nevis	Latin America & Caribbean	16	8	20	1	8	1	
Burundi	Sub-Saharan Africa	17	7	25	1	1	1	
Syria	Middle East & North Africa	18	7	17	1	8	1	

P-INDEXES

The following tables show the ranks from the P-indexes.

TABLE 19: P-index ranks for countries in XL group (sorted by People score)

Country	Region	People	Planet	Prosperity
Germany	Europe & Central Asia	1	1	1
France	Europe & Central Asia	2	2	4
United Kingdom	Europe & Central Asia	3	4	2
China	East Asia & Pacific	4	3	3
South Korea	East Asia & Pacific	5	6	6
Japan	East Asia & Pacific	6	5	7
United States	North America	7	7	8
Spain	Europe & Central Asia	8	8	9
Italy	Europe & Central Asia	9	10	5
Australia	East Asia & Pacific	10	12	12
Turkey	Europe & Central Asia	11	14	11
India	South Asia	12	13	13
Netherlands	Europe & Central Asia	13	11	10
Brazil	Latin America & Caribbean	14	9	14
Canada	North America	15	17	17
Mexico	Latin America & Caribbean	16	15	16
Russia	Europe & Central Asia	17	16	15
Indonesia	East Asia & Pacific	18	18	18
Saudi Arabia	Middle East & North Africa	19	19	19

TABLE 20: P-index ranks for countries in L group (sorted by People score)

Country	Region	People	Planet	Prosperity
Thailand	East Asia & Pacific	1	4	5
Czechia	Europe & Central Asia	2	1	1
Romania	Europe & Central Asia	3	3	4
Greece	Europe & Central Asia	4	16	19
Poland	Europe & Central Asia	5	2	2
Sweden	Europe & Central Asia	6	10	3
Finland	Europe & Central Asia	7	15	6
Austria	Europe & Central Asia	8	6	10
Denmark	Europe & Central Asia	9	12	11
South Africa	Sub-Saharan Africa	10	7	9
Singapore	East Asia & Pacific	11	18	13
Slovakia	Europe & Central Asia	12	8	16
Switzerland	Europe & Central Asia	13	11	7
Hungary	Europe & Central Asia	14	5	8
Belgium	Europe & Central Asia	15	13	14
Malaysia	East Asia & Pacific	16	14	12
Norway	Europe & Central Asia	17	19	17
Portugal	Europe & Central Asia	18	23	21
Bulgaria	Europe & Central Asia	19	17	15
Hong Kong SAR China	East Asia & Pacific	20	20	22
Egypt	Middle East & North Africa	21	24	18
Ireland	Europe & Central Asia	22	25	25
Argentina	Latin America & Caribbean	23	9	26
Colombia	Latin America & Caribbean	24	21	24
Ukraine	Europe & Central Asia	25	22	20
United Arab Emirates	Middle East & North Africa	26	27	28
New Zealand	East Asia & Pacific	27	28	23
Vietnam	East Asia & Pacific	28	29	30
Israel	Middle East & North Africa	29	30	35
Philippines	East Asia & Pacific	30	31	32
Peru	Latin America & Caribbean	31	26	27
Iran	Middle East & North Africa	32	37	39
Chile	Latin America & Caribbean	33	33	31
Kazakhstan	Europe & Central Asia	34	34	29
Ethiopia	Sub-Saharan Africa	35	36	34

TABLE 21: P-index ranks for countries in M group (sorted by People score)

Country	Region	People	Planet	Prosperity
Slovenia	Europe & Central Asia	1	2	2
Serbia	Europe & Central Asia	2	1	1
Belarus	Europe & Central Asia	3	3	3
Sri Lanka	South Asia	4	4	8
Latvia	Europe & Central Asia	5	6	7
Lithuania	Europe & Central Asia	6	9	6
Zambia	Sub-Saharan Africa	7	8	10
Uruguay	Latin America & Caribbean	8	5	5
Côte d'Ivoire	Sub-Saharan Africa	9	15	17
Botswana	Sub-Saharan Africa	10	11	21
Georgia	Europe & Central Asia	11	19	9
Costa Rica	Latin America & Caribbean	12	7	4
Moldova	Europe & Central Asia	13	26	19
Zimbabwe	Sub-Saharan Africa	14	12	15
Tanzania	Sub-Saharan Africa	15	10	18
Congo - Kinshasa	Sub-Saharan Africa	16	14	16
Bahrain	Middle East & North Africa	17	20	28
Tunisia	Middle East & North Africa	18	16	13
Burkina Faso	Sub-Saharan Africa	19	24	26
Croatia	Europe & Central Asia	20	18	12
Jordan	Middle East & North Africa	21	25	35
Malawi	Sub-Saharan Africa	22	23	23
Luxembourg	Europe & Central Asia	23	21	22
Benin	Sub-Saharan Africa	24	36	30
North Macedonia	Europe & Central Asia	25	27	20
Madagascar	Sub-Saharan Africa	26	22	27
Namibia	Sub-Saharan Africa	27	28	24
Mongolia	East Asia & Pacific	28	13	11
Senegal	Sub-Saharan Africa	29	34	31
Mozambique	Sub-Saharan Africa	30	30	32
Angola	Sub-Saharan Africa	31	31	33
Yemen	Middle East & North Africa	32	32	34
Mali	Sub-Saharan Africa	33	33	39
Cyprus	Europe & Central Asia	34	35	37
Niger	Sub-Saharan Africa	35	37	36

TABLE 22: P-index ranks for countries in S group (sorted by People score)

Country	Region	People	Planet	Prosperity
Togo	Sub-Saharan Africa	1	1	1
Eswatini	Sub-Saharan Africa	2	2	2
Seychelles	Sub-Saharan Africa	3	3	3
Lesotho	Sub-Saharan Africa	4	4	4
Guinea-Bissau	Sub-Saharan Africa	5	5	5
Bhutan	South Asia	6	8	8
St. Lucia	Latin America & Caribbean	7	7	9
Burundi	Sub-Saharan Africa	8	6	7
Montenegro	Europe & Central Asia	9	9	6
Barbados	Latin America & Caribbean	10	10	12
Sierra Leone	Sub-Saharan Africa	11	16	10
Syria	Middle East & North Africa	12	13	13
Gambia	Sub-Saharan Africa	13	11	11
Fiji	East Asia & Pacific	14	14	15
St. Kitts & Nevis	Latin America & Caribbean	15	15	16
Belize	Latin America & Caribbean	16	17	17
Antigua & Barbuda	Latin America & Caribbean	18	12	14
St. Vincent & Grenadines	Latin America & Caribbean	18	18	18

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