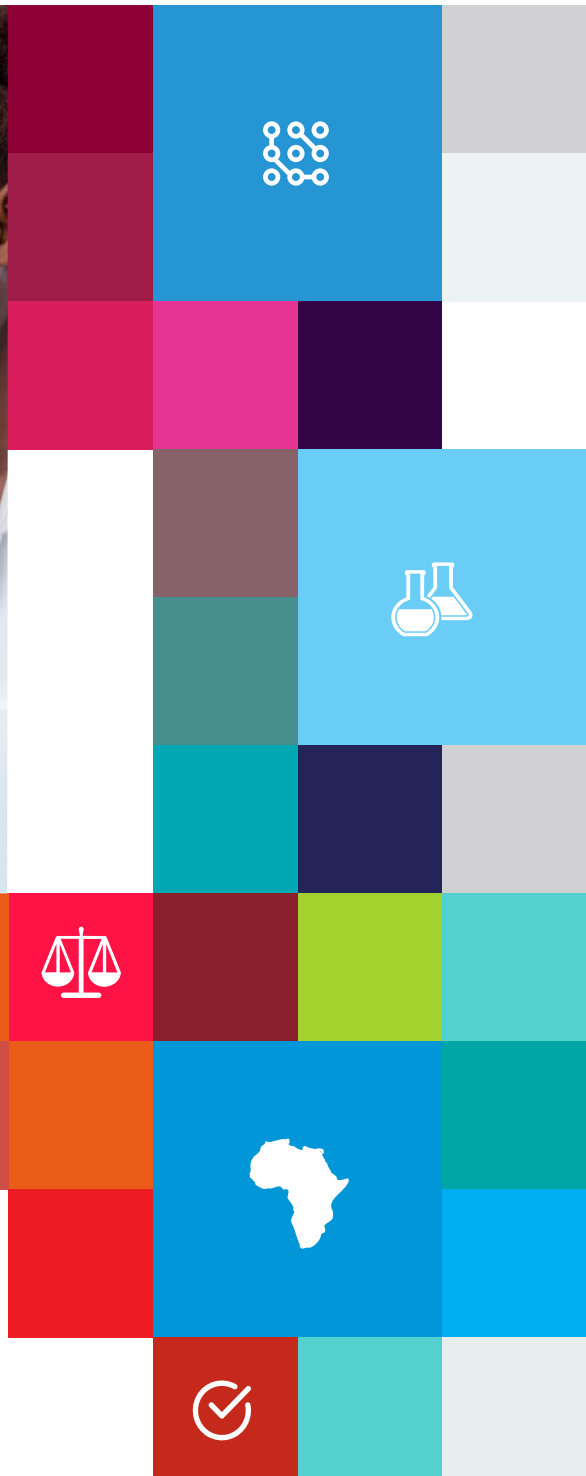




UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



QI⁴SD

Quality Infrastructure for Sustainable Development Index

REGIONAL REPORT FOR AFRICA



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INDUSTRIAL DEVELOPMENT ORGANIZATION

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REGIONAL REPORT FOR AFRICA

Vienna, Austria 2024



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INTRODUCTION

The International Network on Quality Infrastructure (INetQI) defines Quality Infrastructure (QI) as “*The system comprising the organizations (public and private) together with the policies, relevant legal and regulatory framework, and practices needed to support and enhance the quality, safety and environmental soundness of goods, services and processes*”¹. In simpler terms, it is a system that provides confidence that products and services meet the needs and expectations of consumers, business users, and public officials regarding quality, safety, sustainability, efficiency, interoperability, and more. QI can help to promote and disseminate international best practices across all sectors and can improve the efficiency and economics of key fields, such as manufacturing, agriculture, trade, and others. When established as a holistic and robust system, QI can have a multiplier effect and provide a solid foundation for healthcare, legal, and education systems².

A national QI comprises institutions involved in metrology, standardization, accreditation, conformity assessment, and market surveillance, working within the relevant policy, legal, and regulatory frameworks. QI

¹ International Network on Quality Infrastructure. Quality Infrastructure Definition. INetQI. <https://www.inetqi.net/documentation/quality-infrastructure-definition/#:-:text=The%20system%20comprising%20the%20organizations,of%20goods%2C%20services%20and%20processes.>

² International Organization for Standardization (2023). Building trust - The conformity assessment toolbox. ISO. <https://www.iso.org/publication/PUB100230.html>

should be seen as a system in which every component is essential. Any weakness in one of these components compromises the efficiency of the whole system, thus impacting a country’s business environment³. Developing countries often lack a standardized set of practices and procedures that align with international criteria, ensuring compliance with international standards, solid inspection and certification systems, and a transparent trade environment capable of fulfilling the Trade Facilitation Agreement (TFA) requirements, among other things⁴.

QI should not be perceived as a barrier to trade, but rather as a prerequisite for effective trade and a catalyst for economic growth. It plays a pivotal role in stimulating demand for quality products and services, thereby invigorating businesses and fostering economic growth. Therefore, QI has the capacity to enhance the competitiveness of a country’s enterprises, improve the safety and well-being of its society and citizens, and increase a nation’s ability to engage in global

³ United Nations Industrial Development Organization (2019, December 1). Rebooting Quality Infrastructure for a sustainable future. https://hub.unido.org/sites/default/files/publications/QI_SDG_PUBLICATION_Dec2019.pdf

⁴ Van Rompaey, F. (2017, January 23). The Role of Standards and Quality Infrastructure in Trade Facilitation [Power Point slides]. United Nations Industrial Development Organization. https://unctad.org/system/files/non-official-document/FrankVanRompaey_UNIDO_NTFCForum_Jan2017.pdf

trade and participate in global value chains (GVC)⁵. The establishment or enhancement of QI can significantly support a nation in aligning its development path with the Sustainable Development Goals (SDGs) outlined in the 2030 Agenda for Sustainable Development. A national QI can contribute to three of the five pillars (People, Planet, Prosperity, Peace, and Partnerships) that shape the SDGs and highlight their interconnectedness, namely People, Planet, and Prosperity.

The Quality Infrastructure for Sustainable Development (QI4SD) Index, developed by the United Nations Industrial Development Organization (UNIDO), provides a framework of indicators that summarizes the overall state of development readiness for a country and/or region's QI to support the SDGs. Countries are categorized into GDP groups, and within these groups, countries are ranked based on their QI readiness for SDG implementation. It is crucial to note that the majority of the ranking information pertains to ranks within these groups, and even within the same GDP groups, countries vary considerably in size and other growth indicators. The data from INetQI⁶ organizations was collected from February to June 2021. However, the data year might differ from the year of collection as these organizations have different timeframes for updating their information. INetQI members encompass some of the most prominent QI organizations including:

BIPM	Bureau International des Poids et Mesures
IAF	International Accreditation Forum
IEC	International Electrotechnical Commission
IIOA	Independent International Organisation for Assurance
ILAC	International Laboratory Accreditation Cooperation
IQNET	International Certification Network
ISO	International Organisation for Standardisation
ITC	International Trade Centre
ITU	International Telecommunications Union
OIML	Organisation Internationale de Métrologie Légale
TIC	Council
UNECE	United Nations Economic Commission for Europe
UNIDO	United Nations International Development Organisation
WBG	World Bank Group
WTO	World Trade Organisation

⁵United Nations Industrial Development Programme (2021, December 23). ANNEX I- DESCRIPTION OF THE ACTION | QUALITAN: Quality standards and compliance programme for the United Republic of Tanzania. European Union. UNIDO. <https://downloads.unido.org/ot/30/30/30307143/Annex%20I%20-%20Description%20of%20Action%20CTR%20428-294.docx.pdf>

⁶International Network on Quality Infrastructure (2023). What we do?. INetQI. <https://www.inetqi.net/>

The QI4SD Index is designed to address the scarcity of data explicitly measuring the status of QI in a specific country and its correlation with a nation's capability to fulfill its sustainable development objectives. This index serves as a valuable tool to facilitate the formulation of policy frameworks and the development of implementation plans for achieving the SDGs. It is intended for use by national governments, ministries, development organizations, financial institutions, and donors seeking to tailor their compliance-building interventions to target the specific pain points and gaps identified by the index.

The present report was prepared by UNIDO and was validated thanks to various consultations with QI national officers and international experts from INetQI that participated in the Expert Group Meeting (EGM) held in Vienna in November 2023, as well as subsequent revisions and comments from UNIDO QI experts.

This report was developed under the Global Quality and Standards Programme (GQSP), funded by Switzerland through its State Secretariat for Economic Affairs (SECO).

The [UNIDO Knowledge Hub](#) contains a lot of information, online trainings, and digital tools about QI including the [QI4SD Index](#). Any feedback and comments on this report are welcomed and can be addressed to knowledgehub@unido.org.





METHODOLOGY

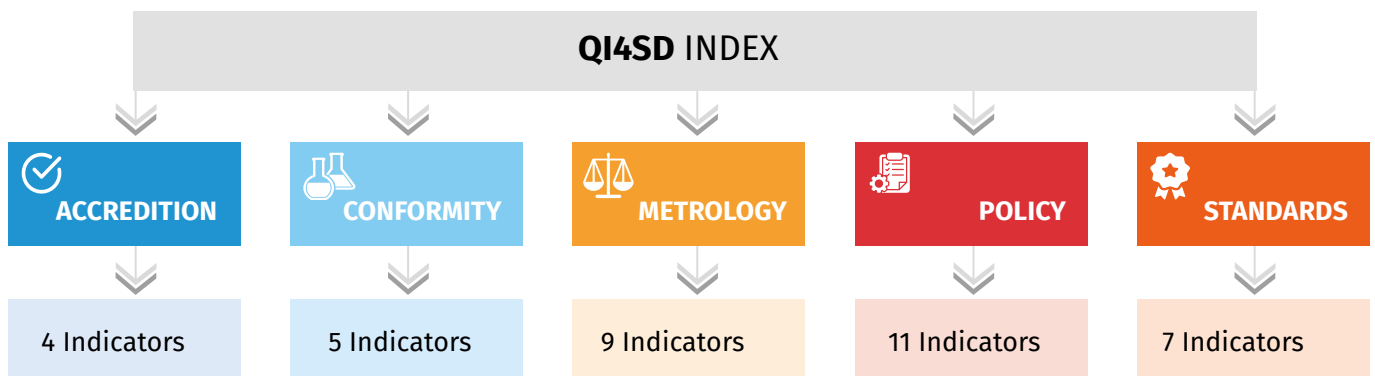


The QI4SD Index is a multidimensional concept and is decomposed into the following five dimensions that are captured with 36 indicators from combined data sources: Standardization, Conformity assessment, Metrology, Accreditation, and Policy. The list of the 36 indicators can be found in the Annex.

Indicators were selected for each dimension following a literature review and rounds of discussion with partner organizations and screened based on criteria including relevance, value added, data availability, and others. The data for the indicators was provided from INetQI members' official information and a joint ISO-UNIDO survey in the case of the policy indicator considering the period from February to June 2021. The final resulting indicators were aggregated into an index following composite indicator methodology, including data treatment, normalization, and aggregation.

Using the selected indicators for each of the five dimensions, the QI4SD Index measures QI by aggregating the data from the indicators into a composite indicator translated into a single aggregate score for each country. Thus, the Index allows for a rapid assessment of the QI system (by means of a score) in a country and/or region. **Figure 1** illustrates the design/framework of the QI4SD Index. The Index's first edition was launched in June 2022. Thanks to feedback received from international and national QI experts following the launch of the QI4SD Index platform, a need to review the QI4SD methodology and initiate a new phase of data collection has been identified. The plan is to undergo a comprehensive review exercise and conduct data collection from February to June 2024, with the aim of launching the Second Edition of the Index by November 2024.

FIGURE 1: THE 5 QI DIMENSIONS AND 36 INDICATORS



In addition, each country has a score called a P-index score representing the state of QI across the People, Planet, and Prosperity pillars, using data related to social, environmental, and economic issues respectively. These scores are calculated using a subset of the indicators in the Standards, Conformity Assessment, Metrology, and Accreditation dimensions. As there was no sufficient data available for the Policy dimension, it was not used in the calculations of the P-index scores. **Figure 2** shows how the 3Ps (People, Planet and Prosperity) indexes are composed of 4 dimensions and 9 indicators.

For detailed information on the methodology used to design the QI4SD Index framework, refer to the [QI4SD methodological annex](#).

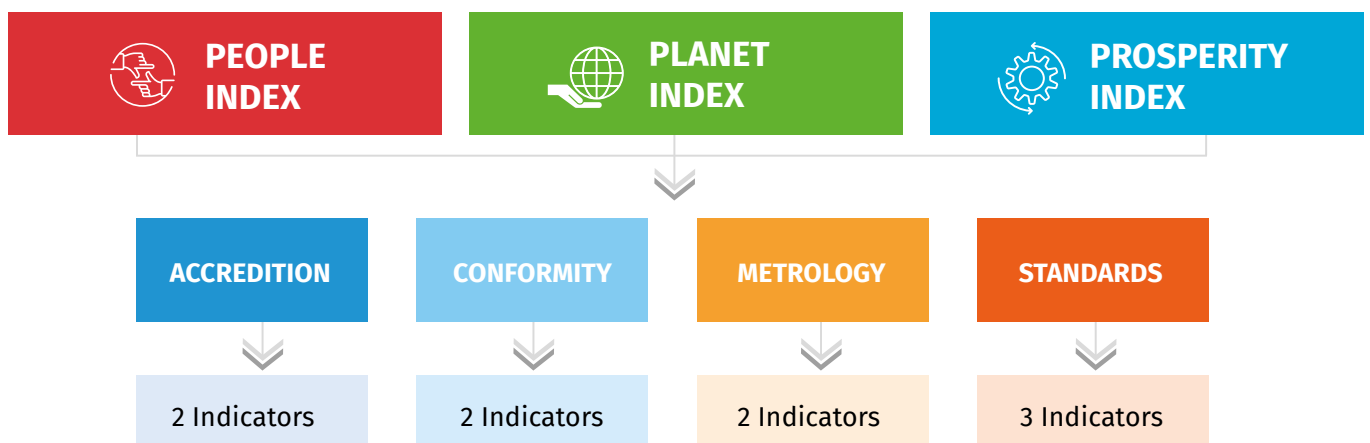
The QI4SD Index covers **137 countries**. These countries were selected based on data availability rules in the

year 2021. Countries were excluded if they have less than 60% data availability over all indicators or more than 66% zero values across all indicators. This excludes mostly very small countries but retains a wide coverage and has the effect of improving data availability for indicators.

Disclaimer:

Some countries shown have missing data values in the Policy dimension. The Policy score is only calculated when at least 60% of its indicators have data available, and since the Policy dimension was based on the UNIDO/ISO survey, missing data occurs for countries that did not respond to the survey or did not respond to the Policy questions in the survey. The index-level ranks of these countries should therefore be treated with a little caution since they are based on four-dimension scores rather than five.

FIGURE 2: 4 QI DIMENSIONS AND 9 INDICATORS CONSTITUTE THE 3PS (PEOPLE, PLANET, PROSPERITY) INDEXES





CONTEXT FOR ANALYSIS



In September 2023, the African Union (AU) was made a permanent member of the Group of 20 (G20) at the G20's summit in Delhi, India. It had previously been an invited international organization and becoming a full member in a group which prior to the AU's joining represented about 85% of global GDP and 75% of global trade along with two-thirds of the world's population, should increase Africa's voice and influence on the world stage⁷. A much needed voice as the continent is currently home to a growing and young population of 1.3 billion citizens, which is projected to account for a quarter of the world's population by 2050. Africa also produces 60% of the world's renewable resources and is home to 30% of the minerals needed for carbon technologies and the green economy⁸.

One of the flagship projects of the African Union's Agenda 2063, known as *The Africa We Want*, is the African Continental Free Trade Area (AfCFTA). This groundbreaking agreement aims to eliminate trade barriers within Africa, enabling the free flow of goods and services and ultimately creating a single market for the continent, thereby significantly boosting intra-Africa trade⁹. Currently, for all African regional communities, more than 60% of exports were intended for markets outside the continent and more than 80% of imports originated from outside Africa. Moreover, the majority of these exports were focused within a given regional economic community¹⁰.

While the operational phase of the AfCFTA was officially launched in July 2019, trade activity has yet to start under the agreement. However, in October 2022, the AfCFTA Guided Trade Initiative was introduced to pilot the operational, institutional, legal, and trade policy framework among the eight participating countries, namely Cameroon, Egypt, Ghana, Kenya, Mauritius, Rwanda, Tanzania, and Tunisia¹¹. As of August 2023, 47 of the 54 signatory countries have deposited their instruments of AfCFTA ratification. In addition to establishing the world's largest free trade area, the AfCFTA agreement holds the potential to uplift 30 million people from extreme poverty and increase the incomes of another 68 million individuals living on less than \$5.50 per day. Once the AfCFTA is fully implemented, measures designed to facilitate trade and streamline customs' procedures are projected to generate \$292

⁷ World Economic Forum (2023, September 14). The African Union has been made a permanent member of the G20 – what does it mean for the continent. <https://www.weforum.org/agenda/2023/09/african-union-g20-world-leaders/>

⁸ Euro-Mediterranean Economists Association. The African Union is granted G20 membership. <https://euromed-economists.org/the-african-union-au-is-granted-g20-membership/#:~:text=The%20September%202023%20G20%20Summit,single%20G20%20black%20majority%20representative.>

⁹ East African Community. African Continental Free Trade Area (AfCFTA) Agreement. EAC. <https://www.eac.int/trade/international-trade/trade-agreements/african-continental-free-trade-area-afcfta-agreement#:~:text=The%20AfCFTA%20entered%20into%20force,continental%20engagements%20spanning%20since%202012>

¹⁰ United Nations Economic Commission for Africa (2020). Identifying priority products and value chains for standards harmonization in Africa. Technical study. UNECA. https://www.paqi.org/wp-content/uploads/2020/10/ATPC_Identifying-priority-products-and-value-chains-for-standards-harmon....pdf

¹¹ African Growth and Opportunity Act (2023, September 06). Status of AfCFTA Ratification. AGOA. <https://www.tralac.org/resources/infographic/13795-status-of-afcfta-ratification.html>

billion in potential income gains¹². Against this backdrop of trade facilitation and the removal of technical trade barriers, an analysis of the current state of Quality Infrastructure in African countries and the provision of recommendations for its enhancement is especially timely.

Based on the World Bank grouping, the African continent is divided into two subregions: the Northern African region and the Sub-Saharan African region. The sub-Saharan African region is divided into four subcategories: Eastern Africa, Middle or Central Africa, Southern Africa, and Western Africa. For each subregion, the QI4SD Index scores for each African country as well as the scores for each of the five dimensions will be presented and the data will be analyzed.

Disclaimer: Raw indicator data for all 54 countries in Africa has been collected. However, 40% of the countries have data gaps and are consequently excluded from the QI4SD index calculation. Therefore, the QI4SD Index framework for Africa covers **31 countries**.

Disclaimer: Some African countries have missing data values in the Policy dimension. The Policy score is only calculated when at least 60% of its indicators have data available, and since the Policy dimension was based on the UNIDO/ISO survey, missing data occurs for countries that did not respond to the survey or did not respond to the Policy questions in the survey. The index-level ranks of these countries should thus be treated with a little caution since they are based on four dimension scores rather than five.

Disclaimer: The index doesn't currently consider membership of regional accreditation bodies, which may be addressed in the Second Edition of the QI4SD Index. This has had a negative impact on the Accreditation dimension scores of several African countries.

Based on their QI4SD Index score, South Africa followed by Tunisia, Egypt, and Kenya scored the highest. However, three of the top four countries have a missing score for the Policy dimension. Thus, their index-level ranks should be treated with a little caution since they are based on four-dimension scores rather than five. For the P-indexes results - People, Planet and Prosperity indexes, the data shows that countries have quite similar ranks in each of the three Ps. This means that if a country is doing well in the People pillar, it's most likely doing well in the Planet and Prosperity pillars. South Africa, followed by Egypt and Tunisia, have the highest ranks in all three P-indexes. However, Kenya which ranks 4th in the People index (as with the general QI4SD Index) only ranks 8th in the Planet index and 6th in the Prosperity index. Other major rank differences are found for Morocco, Sudan, Seychelles, Algeria, and Côte d'Ivoire with more than eight rank differences. In the next sections, the QI index scores and P indexes for each country in the five subregions will be analyzed further. According to the African Union's classification, the North African region covers seven countries, namely, Algeria, Egypt, Libya, Mauritania, Morocco, Sahrawi

¹² World Bank (2020, July 27). The African Continental Free Trade Area. WB. <https://www.worldbank.org/en/topic/trade/publication/the-african-continental-free-trade-area>



NORTHERN AFRICA



Republic, and Tunisia¹³. These nations have overlapping memberships in the Common Market for Eastern and Southern Africa (COMESA), the Arab Maghreb Union (AMU), and the Community of Sahel-Saharan States (CEN-SAD).

¹³ African Union. Member States. https://au.int/en/member_states/countryprofiles2

CONTEXT

In 2024, North Africa's regional economic growth is expected to continue to average about 3.9% and is projected to increase to reach 4.1% in 2025¹⁴. As the Russian - Ukrainian conflict and the effects of the Covid-19 pandemic have caused a disruption of global supply chains and an increase in food and fuel prices, the region grapples with record-high inflation rates reaching 8.2% in 2022 up from 4.6% in 2021¹⁵.

¹⁴ African Development Bank Group. North Africa. <https://www.afdb.org/en/documents-publications-africas-macro-economic-performance-and-outlook/north-africa>

¹⁵ African Development Bank Group (2023, July 26). North Africa Economic Outlook 2023. ADBG. <https://www.afdb.org/en/documents/north-africa-economic-outlook-2023>

The region faces significant climate change effects as can be seen by rising sea levels, droughts, and the fact that average and seasonal surface temperatures have already increased at twice the global rate. In September 2023, a devastating storm raged over the Libyan city of Derna, killing thousands of people. According to the World Weather Attribution group, up to 50% more rain had fallen due to human-caused greenhouse emissions. Unfortunately, this type of event may start occurring more frequently in the region¹⁶. Therefore, increasing the availability and distribution of climate finance, unlocking private investments and harnessing mineral resources and renewables to encourage the transition

towards green growth for all countries across the North African region is crucial.

ANALYSIS OF THE SUBREGION

The QI4SD Index framework covers **5 countries** in the North African region. **Figure 3** illustrates the QI4SD Index scores for the North African countries included in the framework.

FIGURE 3: MAP OF THE NORTH AFRICAN REGION BASED ON QI4SD INDEX SCORES

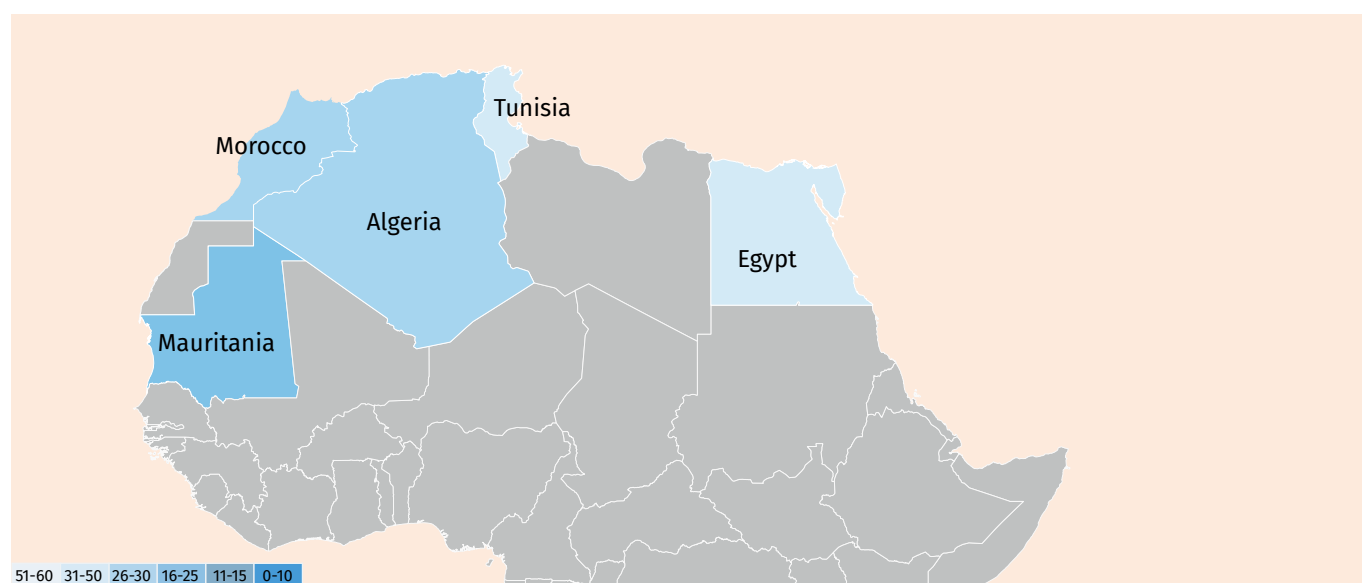


TABLE 1: QI4SD INDEX SCORES FOR COUNTRIES IN NORTH AFRICA

Country	Africa QI4SD Index Rank	Overall QI4SD Index Rank	Index	Standards	Conformity	Metrology	Accreditation	Policy
Tunisia	2	39	50	43	4	35	75	93
Egypt	3	56	42	51	4	37	75	NA
Morocco	5	68	34	44	3	30	1	94
Algeria	12	85	28	43	2	15	51	NA
Mauritania	15	91	24	15	1	1	1	100
		min	7	15	1	1	1	44
		max	60	63	19	70	88	100

¹⁶ BBC News (2023, September 19). Climate change played major role in Libya floods. <https://www.bbc.com/news/science-environment-66854670>

TABLE 2: P-INDEX RANKS FOR COUNTRIES IN NORTH AFRICA

Country	People Rank	Planet Rank	Prosperity Rank
Tunisia	3	3	3
Egypt	2	2	2
Morocco	8	6	14
Algeria	23	17	15
Mauritania	29	31	30

Based on **Tables 1 and 2**, the North African region enjoys relatively high QI4SD scores, with Tunisia ranking 2nd, Egypt 3rd, and Morocco 5th in Africa. Algeria and Mauritania also belong to the upper half of the African countries ranking. Only three countries have Policy

scores, but they are all very high. In the Accreditation dimension, three countries have high scores, while the other two, namely Morocco and Mauritania, have a score of 1. It is worth mentioning that the Index does not currently account for membership in regional accreditation bodies. Nevertheless, it should be noted that all countries in the region are members of the Arab Accreditation Cooperation (ARAC), which has been recognized since October 2017 as an Independent Regional Accreditation Group by the International Accreditation Forum (IAF) and ILAC¹⁷. Hence, in the second edition of the QI4SD Index, Morocco and Mauritania may see an improvement in their Accreditation score. In the Standardization dimension, all countries except Mauritania have on average a score of 45, higher than the median Standardization score of 35 for African nations. Metrology scores are relatively low, with an average of 24. Finally, the Conformity Assessment scores are very low for North African countries with the highest score being 4. Thus, conformity assessment requires a significant improvement from all countries in the region.

¹⁷The Arab Accreditation Cooperation. About us. ARAC. <https://arabaccreditation.org/>





CASE STUDY: TUNISIA

Country	Republic of Tunisia
Continent	North Africa
Population	12.46 million (2023) ¹⁸
GDP	USD 48.53 billion (2023) ¹⁹
GDP per capita	USD 3,895 (2023) ²⁰
Income Level	Lower-middle income (2022)
Human Development Index	0.73 (2021) ²¹
Value added by Agriculture, Forestry and Fishing	10.1% of GDP (2022) ²²
Value added by Industry	23% of GDP (2022)
Global Competitiveness Index	87 out of 141 countries (2019)
Main Trade Agreements	AMU / COMESA / ECOWAS / AfCFTA
Main exports – 2022	Insulated Wire (\$2.86B) / Refined Petroleum (\$927M), Crude Petroleum (\$862M) / Non-Knit Men’s Suits (\$846M) / Pure Olive Oil (\$827M) ²³
Main trading partners	France, Italy, Germany, Libya, China, Türkiye, Spain

¹⁸ World Bank (2023). Population, total – Tunisia. <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=TN>

¹⁹ World Bank (2023). GDP (current US). Tunisia <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=TN>

²⁰ World Bank (2023). GDP per capita (current US\$). Tunisia. <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=TN>

²¹ Knoema (2021). The human development index of the Republic of Tunisia. <https://knoema.com/data/tunisia+human-development-index>

²² World Bank (2022). Agriculture, forestry, and fishing, value added (% of GDP) – Tunisia. <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=TN>

²³ Observatory of Economic Complexity. Country Profile-Tunisia. OEC. <https://oec.world/en/profile/country/tun>

Since the Jasmine revolution of 2011, Tunisia's economy has struggled due to political instability. The Covid-19 pandemic and the rise in international commodity prices have contributed to an increase in the country's trade deficit. For 2023, growth is expected to be around 1.6% and to rise marginally in 2024 to 2.1%. Tunisia has received financial assistance from international organizations and in October 2022 concluded an agreement with the International Monetary Fund (IMF) disbursing \$1.9 billion in order to restore external and fiscal stability. The country has large economic regional disparities, with coastal regions enjoying 90% of overall employment while the rural areas suffer from the highest poverty rates. Agriculture is a key sector of the Tunisian economy, accounting for 9.5% of GDP in 2023 and employing 14% of the workforce in 2022. In recent years, there has been an improvement in production methods which allowed the sector to modernise and for the country to reach a better level of food sufficiency. In addition, organic farming is expanding in Tunisia, with the nation being one of the most productive countries in Africa²⁴. The 2023 - 2025 development plan comprises a set of sectoral and regional development priorities, policies and programs, in line with Tunisia's strategic vision for 2035 and the national structural reform program for the next period²⁵. It aims to improve the business climate, give concrete expression to the public/private partnership, develop human capital, strengthen social integration, support regional development efforts and boost the knowledge economy and the green economy. Through the implementation of this plan, the government hopes for an increase in private-sector investment, an upturn in phosphate production, and greener agriculture²⁶.

TABLE 3: QI4SD DIMENSION AND P INDEX SCORES FOR TUNISIA

TUNISIA	Rank in North Africa	Rank in Africa	QI4SD scores
QI4SD Index	1	2	50
Dimensions			
Standards			43
Conformity			4
Metrology			35
Accreditation			75
Policy			93
3-Ps			
People		3	27
Planet		3	22
Prosperity		3	25

²⁴Lloyds Bank (October 2023). Tunisia: Economic and Political Overview. <https://www.lloydsbanktrade.com/en/market-potential/tunisia/economical-context>

²⁵ Ministère de l'Économie et de la Planification (2023 January, 03). Plan 2023-2025 & vision Tunisie 2035. <http://www.mdici.gov.tn/plan-2023-2025-vision-tunisie-2035/>

²⁶N. Hizaoui. (2023 October, 23). Plan triennal de développement 2023-2025 | Accélérer la transition. La Presse. <https://lapresse.tn/148588/plan-triennal-de-developpement-2023-2025-accelerer-la-transition/>

According to **Table 1**, Tunisia has a QI4SD Index score of **49.9**, ranking it **39th** out of the 137 assessed countries. In its GDP group as a lower-middle income country, it performs quite well with a rank of 3 out of 64. Within the North African subregion, Tunisia is ranked 1st out of the 5 countries and 2nd out of the 31 African countries assessed. Per **Table 3**, with regard to the five dimensions, Tunisia has a value of 43.1 for Standardization, 3.9 for Conformity Assessment, 34.6 for Metrology, 75.1 for Accreditation, and 92.6 for Policy. Its best QI areas are policy and accreditation, and to a lesser extent standardization.

Tunisia has done well in the following areas:

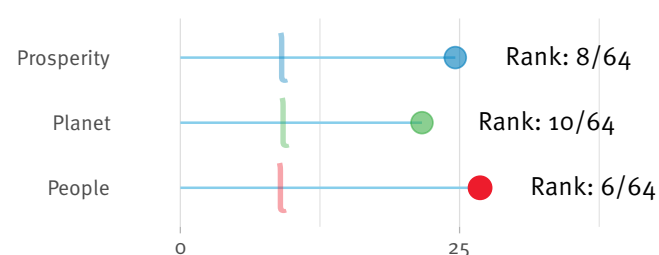
Strengths	Dimension	Rank	Value	Unit
OIML-CS - number of services recognised	Metrology	8	56	Number
Membership of ITU	Standards	25	8	Composite score
Adopted ISO standards	Standards	30	15	Number

Some identified weaknesses which Tunisia should focus on improving are as follows:

Weaknesses	Dimension	Rank	Value	Unit
Participation in IEC technical committees	Standards	63	6	Number
Number of CMCs	Metrology	67	21	Number
Participation in key and supplementary comparisons	Metrology	72	16	Number

Within its GDP group, Tunisia ranked on the three pillars of sustainable development (people, prosperity, and planet) as follows:

P-Scores



Based on the analysis of the QI4SD Index data, some recommendations for Tunisia can be made:

- » **Calibration Laboratories:** As one of the weaknesses identified by the QI4SD Index is the low number of CMCs, Tunisia could be supported to develop a National Measurement Strategy, aimed at increasing the number and effectiveness of its Calibration and Measurement Capabilities (CMCs). Calibration laboratories could be supported to attain ISO/IEC 17025 accreditation. It would allow internationally accredited laboratories in Tunisia and across North Africa to have their equipment calibrated in Tunisia rather than outside the region. Areas of interest to Tunisia could be calibration instruments used for weather, hydrology, and air quality measurement, as they would be critical for several sectors, including agriculture, public health, environmental protection, and disaster management.
- » **Key, supplementary and inter-laboratory comparisons:** Key, supplementary and inter-laboratory comparisons are of interest to the metrology community because they provide the means of demonstrating the degree of equivalence between the measurement capabilities of national metrology institutes. While the inter-laboratory comparisons constitute the technical basis of the CIPM Mutual Recognition Arrangement (MRA), the key comparisons are undertaken by CIPM Consultive Committees, BIPM, or regional metrology organizations (RMOs). In addition, there are supplementary comparisons which may be carried out in order to “meet specific needs not covered by key comparisons”. As all these comparisons have strict rules and guidelines that must be complied with by the participants, a National Metrology Institute (NMI) which manages to successfully participate in a comparison, leads to confidence in calibration and measurement certificated issued by that NMI. Tunisia and other countries in Africa could learn from the Asia-Pacific Metrology Programme (APMP), which has developed a concept to support the access of emerging NMIs to inter-laboratory comparisons as a participant and to gain experience in organizing comparisons. Comparisons at an intermediate technical level or in a measurement field of particular relevance to the emerging NMIs are conducted²⁷.

²⁷ A. P. Drijarkara, C. Sanetra (2012). Inter-laboratory Comparisons for Emerging National Metrology Institutes. PTB. https://www.ptb.de/cms/fileadmin/internet/fachabteilungen/abteilung_9/9.3_internationale_zusammenarbeit/publikationen/208_Guide_Interlaboratory_Comparisons/PTB_Q5_Guide9_Interlaboratory_Comparisons_EN.pdf

RECOMMENDATIONS

Based on the analysis of the QI4SD Index data as well as consultation with national stakeholders, public and private institutions, and development agencies, some recommendations for the North African region can be made:

- » **Standards Harmonization:** Unlike COMESA, EAC, ECOWAS and SADC, the AMU member countries do not have harmonized standards. Furthermore, unlike the other regional African economic communities, the top exports from AMU are largely processed or manufactured goods, with the exception of some agricultural products, such as maize, oil, sugar, and dates. A study could be conducted to identify the agricultural regional value chains across the North African region and the estimated potential export basket of those goods. Then, standards for those commodities should be harmonized across the region. This will support the eventual continental harmonization of standards process under the AfCFTA. The process should be based on value chain priorities that are common across regional communities and that offer potential for strong forward and backward linkages²⁸.
- » **Proficiency Testing Schemes:** Proficiency Testing program provides laboratories with objective assessments of the accuracy and reliability of their test results. Proficiency Testing also provides the opportunity for laboratories to benchmark their performance within a pooled industry group, nationally or internationally. For instance, the East African Regional External Quality Assessment scheme (EA-REQAS) was established with the support of the World Health Organization (WHO) in 2000²⁹. It's an accredited integrated laboratory Proficiency Testing scheme targeting basic laboratory tests and aiming to improve the quality of essential diagnostic services and to prevent and control diseases of public health importance across national health networks. It enables laboratories to benchmark their performance against other participating laboratories³⁰. For the countries in North Africa, a similar regional external quality assessment scheme could be established along with a network of Proficiency Testing Providers and Reference Material Producers for the priority schemes identified based on the needs of the testing and calibration laboratories.

²⁸ United Nations Economic Commission for Africa (2020). Identifying priority products and value chains for standards harmonization in Africa. Technical study. UNECA. https://www.paqi.org/wp-content/uploads/2020/10/ATPC_Identifying-priority-products-and-value-chains-for-standards-harmon....pdf

²⁹ Newsroom (2021, July 14). East African Regional External Quality Assessment Scheme Achieves International Accreditation. Press Release. AMREF-Health Africa. <https://newsroom.amref.org/press-releases/2021/07/east-african-regional-external-quality-assessment-scheme-achieves-international-accreditation/>

³⁰ The East African Regional External Quality Assessment Scheme. About The East African Regional External Quality Assessment Scheme. EA-REQAS. <https://www.eareqas.org/index.php/about-the-ea-reqas>



EASTERN AFRICA



According to the African Union's classification, the East African region covers 14 countries, namely, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, South Sudan, Sudan, Tanzania, and Uganda³¹. These nations have overlapping memberships in Regional Economic Communities (RECs), which are officially recognized by the AU. They are: the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC), the Intergovernmental Authority on Development (IGAD), and the Southern African Development Community (SADC).

CONTEXT

Having been the African continent's fastest growing region in recent years, East Africa is projected to record the highest regional economic performance in the continent in 2023 and 2024, with growth predicted to exceed 5%, according to an African Development Bank Report. This high figure will be driven for the most part by growth in Rwanda, Ethiopia, Djibouti, Tanzania, Uganda, and Kenya. In 2020, Tanzania became the latest

³¹ African Union. Member States. https://au.int/en/member_states/countryprofiles2

country in the region to transition from low-income to lower-middle income status, joining three other neighboring countries in that income group (Kenya, Comoros, and Djibouti). The rest of the countries are classified as low-income, with the exception of Seychelles which enjoys high-income status. These positive growth predictions could be thwarted by external and internal risks, including increased volatility in commodity prices, high inflation rates, a slowdown in international trade, rising debt service costs, political instability and ensuing domestic conflicts, the negative effects of climate change, infrastructure deficiencies, the continued conflict in Ukraine, etc³².

ANALYSIS OF THE SUBREGION

The QI4SD Index framework covers **9 countries** in the East African region. **Figure 4** illustrates the QI4SD Index scores for the Eastern African countries included in the framework.

³² African Development Bank Group. East Africa Regional Overview. AFD. <https://www.afdb.org/en/countries/east-africa/east-africa-overview>

FIGURE 4: MAP OF THE EAST AFRICAN REGION BASED ON QI4SD INDEX SCORES



According to **Tables 4 and 5**, the Eastern African region presents a study in contrasts. On one hand, it boasts three countries that rank among the top 10 in the QI4SD Index score list for African nations, with Kenya leading the region with its 4th rank, then Uganda (7th), and Rwanda (9th). On the other hand, it also includes

TABLE 4: QI4SD INDEX SCORES FOR COUNTRIES IN EASTERN AFRICA

Country	People Rank	Planet Rank	Prosperity Rank
Kenya	4	8	6
Uganda	9	10	10
Rwanda	12	7	7
Mauritius	6	5	8
Seychelles	16	21	25
Tanzania	20	15	19
Ethiopia	10	13	11
Sudan	15	26	24
Madagascar	27	29	27

Madagascar, which, regrettably, ranks last in Africa with a notably low QI4SD Index score. Furthermore, the region is home to the sole African country with a high income level, Seychelles, which, surprisingly, does not correlate with a high QI4SD Index score. Among the nine East African countries, only four have a Policy score. However, it is worth noting that all four of them achieved a high policy score. In the Standardization dimension, the scores are generally favorable, with six countries scoring above or close to the median Standardization score for African nations (35). However, Metrology scores are relatively low, with an average of 16. The Conformity Assessment scores are notably low for East African countries, with all countries, except Kenya, having a score of 1 or 2. Lastly, the Accreditation scores require significant improvement, as six out of the nine countries have a score of 1.

TABLE 5: P-INDEX RANKS FOR COUNTRIES IN EAST AFRICA

Country	East African QI4SD Index Rank	Africa QI4SD Index Rank	Overall QI4SD Index Rank	Index	Standards	Conformity	Metrology	Accreditation	Policy
Kenya	1	4	60	39	40	8	38	72	NA
Uganda	2	7	74	31	44	2	9	1	100
Rwanda	3	9	78	29	41	1	14	1	89
Mauritius	4	11	84	28	32	2	15	62	NA
Seychelles	5	19	99	21	21	1	16	1	68
Tanzania	6	20	101	21	32	1	24	1	47
Ethiopia	7	21	102	21	36	2	8	38	NA
Sudan	8	28	129	12	30	1	15	1	NA
Madagascar	9	31	137	7	16	2	8	1	NA
			min	7	15	1	1	1	44
			max	60	63	19	70	88	100



CASE STUDY: TANZANIA

Country	The United Republic of Tanzania
Continent	Eastern Africa
Population	67.44 million (2023) ³³
GDP	USD 79.16 billion (2023) ³⁴
GDP per capita	USD 1,211 (2023) ³⁵
Income Level – 2022	Lower-middle income
Human Development Index	0.549 (2021) ³⁶
Value added by Agriculture, Forestry and Fishing	23.7% of GDP (2023) ³⁷
Value added by Industry	27.7% of GDP (2023) ³⁸
Global Competitiveness Index	117 out of 141 countries (2019)
Main Trade Agreements	EAC / SADC / EAC-COMESA SADC Tripartite framework / EBA / AGOA
Main exports – 2022	Gold (\$3.34B) / Raw copper (\$1.31B) / Refined copper (\$384M) / Copper Ore (\$288B) / Coconut, Brazil Nuts and Cashews (\$286M) ³⁹
Main trading partners	United Arab Emirates, India, South Africa, Kenya, Rwanda, Japan, Switzerland, Saudi Arabia

³³ World Bank (2023). Population, total – Tanzania. <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=TZ>

³⁴ World Bank (2023). Tanzania. <https://data.worldbank.org/country/tanzania>

³⁵ World Bank (2023). GDP per capita (current US\$). Tanzania. <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=TZ>

³⁶ Knoema (2021). The human development index of the United Republic of Tanzania. <https://knoema.com/data/human-development-index+united-republic-of-tanzania>

³⁷ World Bank (2023). Agriculture, forestry, and fishing, value added (% of GDP) – Tanzania. <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=TZ>

³⁸ World Bank (2023). Industry including construction, value added (% of GDP) – Tanzania <https://data.worldbank.org/indicator/NV.IND.TOTL.ZS?view=map&locations=TZ>

³⁹ Observatory of Economic Complexity. Country Profile-Tanzania. OEC. <https://oec.world/en/profile/country/tza>

Since 2000, Tanzania has had one of Africa’s fastest growing economy, with nearly 7% annual national GDP growth. In July 2020, the World Bank reclassified Tanzania from a low-income country to a lower-middle income one, as its Gross National Income (GNI) per capita exceeded the threshold of \$1,036⁴⁰. Although achieving lower-middle income status earlier than the targeted year 2025 as envisioned in the Tanzania Development Vision 2025 is a reason for celebration, a significant portion of Tanzanians still live below the poverty line of \$1.90 per day⁴¹ (as of 2016). While the agricultural sector in Tanzania employed approximately 64% of the population in 2022, its contribution to the GDP has not shown a lot of growth over the past decade. Nevertheless, there are optimistic signs indicating an increase in agriculture mechanization and overall performance of the sector⁴². Tanzania’s Third Five Year Development Plan (FYDP III) for the period 2021 to 2026 aims to enhance key productive infrastructures, including reliable access to energy, and strengthen its business environment through effective policies. These efforts are intended to facilitate the creation of millions of jobs in the private sector⁴³.

TABLE 6: QI4SD DIMENSION AND P INDEX SCORES FOR TANZANIA

TANZANIA	Rank in East Africa	Rank in Africa	QI4SD scores
QI4SD Index	6	20	21
Dimensions			
Standards			32
Conformity			1
Metrology			24
Accreditation			1
Policy			47
3-Ps			
People		20	8
Planet		15	9
Prosperity		19	7

⁴⁰ M. Turuka, F. (2022, October 20). Tanzania middle income country status and implications for future economic growth strategies. AJOL. <https://www.ajol.info/index.php/tjags/article/view/234455>

⁴¹ U.S Agency for International Development. Economic Growth and Trade. USAID. <https://www.usaid.gov/tanzania/economic-growth-and-trade>

⁴² Further Africa (2022, November 22). Fall of employment in Tanzania agriculture sector, a good sign? The Exchange. <https://furtherafrica.com/2022/11/22/fall-of-employment-in-tanzania-agriculture-sector-a-good-sign/>

⁴³ United Nations Environment Programme (2021, June 1). National Five-Year Development Plan 2021/22 2025/26. UNEP. <https://leap.unep.org/countries/tz/national-legislation/national-five-year-development-plan-202122-202526>

According to Table 4, Tanzania has a QI4SD Index score of **21**, positioning it as the **101st** out of the 137 assessed countries. In its GDP group as a middle income country, it ranks 40th out of 64 and 23rd out of 33 in the lower-middle income country group. Within the East African subregion, Tanzania stands as the 6th out of 9 countries and 20th out of the 31 African countries assessed. Per **Table 6**, in terms of the five dimensions, Tanzania has a value of 32.13 for Standardization, 1.39 for Conformity Assessment, 23.77 for Metrology, 1 for Accreditation, and 47.41 for Policy. Its strongest QI areas are policy and standardization.

Tanzania has done well in the following areas:

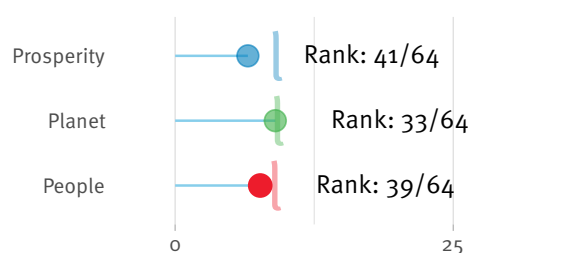
Strengths	Dimension	Rank	Value	Unit
Adopted IEC standards	Standards	28	71	Number
Adopted ISO standards	Standards	37	13	Number
Involvement in OIML project groups	Metrology	38	14	Composite score

Some identified weaknesses which Tanzania should focus on improving are as follows:

Weaknesses	Dimension	Rank	Value	Unit
Number of recognised certificates (ISO)	Conformity	85	831	Number
Participation in key and supplementary comparisons	Metrology	96	1	Number
Number of recognised certificates (IQNet)	Conformity	101	16	Number

Within its GDP group, Tanzania ranked on the three pillars of sustainable development (people, prosperity, and planet) as follows:

P-Scores



Within the African continent, its People score of 8 and Prosperity score of 7 correspond to low ranks of 20th and 19th respectively.

Based on the analysis of the QI4SD Index data, some recommendations for Tanzania can be made:

- » **National Quality Policy:** As exporters in all sectors in Tanzania revealed having difficulty complying with technical requirements and regulations and encountering procedural obstacles, supporting Tanzania with developing a National Quality Policy would be helpful. A National Quality Policy would provide support to Small, Medium and Micro Enterprises (SMMEs) to increase their compliance with standards and technical regulations and would improve coordination and collaboration amongst regulatory agencies. A National Quality Policy is currently being developed by the Ministry of Industry and Trade and the Tanzania Bureau of Standards and support could be provided to ensure that it is aligned with the objectives of the Government of Tanzania in relation to metrology, standardization, accreditation, and conformity assessment⁴⁴.
- » **Number of recognized ISO certificates:** There are over 19,500 ISO International Standards covering all aspects of business and technology and offer multiple benefits to SMEs who get certified in them. ISO standards can help improve the quality of the products and services offered by the company, drive growth and increase profits, provide a competitive advantage when competing with larger enterprises, open up new export markets, enhance the credibility of companies and increase customer confidence, strengthen the business processes and procedures, increase efficiency, and help comply with regulations. The ISO certification process includes an audit of a company's business operations and procedures. Hence, supporting Tanzanian SMEs to get ISO certified has multiple benefits⁴⁵.

RECOMMENDATIONS

Based on the analysis of the QI4SD Index data as well as consultation with national stakeholders, some recommendations for the East African region can be made:

- » **Regional Standards Harmonization:** Members states of the East African Community (EAC) have harmonized 1,876 EAC standards as of July 2022 in order to facilitate intra-EAC, regional and international trade in a variety of sectors. The EAC Standards harmonization process is consistent with the international best practices, including the WTO TBT Agreement and the WTO Code of Good Practice for the development and harmonization of standards. In addition, a new Regional Standardization Plan 2023 – 2026 was developed and is awaiting approval

⁴⁴ International Trade Centre (2022). Invisible Barriers to Trade United Republic of Tanzania: Business Perspectives. <https://intracen.org/file/ntmtanzaniaapril2022-finalweb2022-1pdf>

⁴⁵ International Organization for Standardization. ISO. (2014). 10 Good Things for SMEs. <https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100283.pdf>

by the East African Standards Committee (EASC)
⁴⁶ EAC members could be supported to continue harmonizing standards across the region, especially on actively traded products. It'd also be important to ensure that the countries in Eastern Africa that are not EAC members are similarly supported in their efforts to develop their national standards on strategic products.

- » **Digital tools:** Disseminating existing trade-related digital tools and developing new ones that provide accurate information on preferential tariffs, non-tariff measures (NTMs), rules of origins, and other trade-related factors is essential. For instance, Vietnam has successfully developed the Vietnam National Trade Repository, which serves as a valuable resource for stakeholders seeking knowledge on food safety, NTMs, conformity assessment processes and bodies, regulations, standards, and more. In Eastern Africa, Tanzania has launched the Tanzania Trade Information Portal to contain accurate and up-to-date information on the main exported products and the importing market regulations related to them⁴⁷. Similarly, Kenya boasts its own portal named the Info Trade Kenya⁴⁸. In the case of Rwanda, support was provided by Trade Mark Africa to develop an e-portal which automated the internal and external services of the Rwanda Standards Board (RSB). The portal is composed of an internal Management Information System (MIS) used for internal processes and an external system that importers and exporters can interact with. The use of the e-portal increased the efficiency of the RSB and allowed it to reduce the time taken to process applications for certifications and other conformity assessment services. It has also permitted individuals and companies to save time by eliminating the need to visit the RSB to access information as they can get all the needed data online as well as receive feedback on their applications⁴⁹.

⁴⁶ East African Community. Realizing the SQMT Act Objectives. <https://www.eac.int/trade/sqmt/sqmt-act-implementation/270-sector/trade/sqmt#:~:text=EAC%20Standards%20harmonization%20process%20is,development%20and%20harmonization%20of%20Standards>.

⁴⁷ International Trade Centre (2022). Invisible Barriers to Trade United Republic of Tanzania: Business Perspectives. <https://intracen.org/file/ntmtanzaniaapril2022-finalweb2022-1pdf>

⁴⁸ Info Trade Kenya. <https://infotradekenya.go.ke/>

⁴⁹ Trade Mark Africa (2019, May 20). Use of modern ICT in conformity assessment to improve service delivery to the stakeholders – The case of Rwanda. <https://www.trademarkafrica.com/stories/use-of-modern-ict-in-conformity-assessment-to-improved-service-delivery-to-the-stakeholders-the-case-of-rwanda/>





CENTRAL AFRICA



According to the African Union's classification, the Central African region covers nine countries, namely, Burundi, Cameroon, Central African Republic, Chad, Congo, the Democratic Republic of Congo, Equatorial Guinea, Gabon, and Sao Tomé and Príncipe⁵⁰. These nations have overlapping memberships in regional economic communities, which are the Economic Community of Central African States (ECCAS), the Central African Economic and Monetary Community (CEMAC), and COMESA.

⁵⁰ African Union. Member States. https://au.int/en/member_states/countryprofiles2

ANALYSIS OF THE SUBREGION

The QI4SD Index framework covers **2 countries** in the Central African region. **Figure 5** illustrates the QI4SD Index scores for the Central African countries included in the framework.

FIGURE 5: MAP OF THE CENTRAL AFRICAN REGION BASED ON QI4SD INDEX SCORES



TABLE 7: QI4SD INDEX SCORES FOR COUNTRIES IN CENTRAL AFRICA

Country	Central African QI4SD Index Rank	Africa QI4SD Index Rank	Overall QI4SD Index Rank	Index	Standards	Conformity	Metrology	Accreditation	Policy
Burundi	1	22	108	18	22	1	1	1	66
Gabon	2	23	109	18	42	1	1	1	44
			min	7	15	1	1	1	44
			max	60	63	19	70	88	100

TABLE 8: P-INDEX RANKS FOR COUNTRIES IN CENTRAL AFRICA

Country	People Rank	Planet Rank	Prosperity Rank
Burundi	30	28	29
Gabon	11	11	5

As QI4SD Index data is available for only two countries in Central Africa, no regional analysis will be carried out. Instead, the QI4SD scores of Burundi and Gabon will be discussed in more details in the sections below.



CASE STUDY: BURUNDI

Country	Republic of Burundi
Continent	Central Africa
Population	13.23 million (2023)⁵¹
GDP	USD 2.64 billion (2023)
GDP per capita	USD 199.6 (2023)⁵²
Income Level – 2022	Low income
Human Development Index	0.426 (2021)⁵³
Value added by Agriculture, Forestry and Fishing	25.2% of GDP (2023)⁵⁴
Value added by industry	9.6% of GDP (2023)
Global Competitiveness Index	135 out of 141 countries (2019)
Main Trade Agreements	WTO / COMESA / CEPGL / ECA
Main exports – 2022	Gold (\$53.4M) / Coffee (\$31.1M) / Tea (\$26.2M) / Niobium, Tantalum / Vanadium and Zirconium Ore (\$10.6M) / Rolled Tobacco (\$9.3M)⁵⁵
Main trading partners	United Arab Emirates / Congo / China / Sudan / India / Tanzania / Saudi Arabia / Germany

⁵¹ World Bank (2023). Population, total – Burundi. <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=BI>

⁵² World Bank (2023). GDP per capita (current US\$). Burundi. <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=BI>

⁵³ United Nations Development Programme. Human Development Report 2021-22. Uncertain Times, Unsettled Lives: Shaping our Future in a Transforming World. UNDP. <https://hdr.undp.org/content/human-development-report-2021-22>

⁵⁴ World Bank (2023). Agriculture, forestry, and fishing, value added (% of GDP) – Burundi. <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=BI>

⁵⁵ Observatory of Economic Complexity. Country Profile-Burundi. OEC. <https://oec.world/en/profile/country/bdi>

A landlocked country in East Africa, Burundi is a low income country, with 80% of the population employed in the agricultural sector. With a population of slightly less than 13 million people in 2022, Burundi is one of the most densely populated countries in the world, with a density ratio of 442 people per square kilometer (2020 population projection). GDP grew by 2.8% in 2023 up from 1.8 % in 2022 driven by the agricultural sector and services. Agricultural production is expected to recover, provided there is enough favorable rainfall and good distribution of fertilizer. Growth in the services sector will continue to be supported by transport, telecommunications, and the financial sector. For the industry sector, growth remains weak due to the disruption of mining activities and the energy deficit.

Burundi continues to suffer from very high inflation rates reaching an average of 27.1% in 2023 driven by increases in food and fuel prices. Fuel shortages worsened in June 2023 due to supply disruptions caused by the war in Ukraine. The fiscal deficit is projected to decline to 6.7% of GDP in 2023 from 12.1% in 2022, due to cuts in current expenditure and small increases in revenues⁵⁶.

In June 2018, Burundi launched a National Development Plan (PND Burundi 2018-2027) at a time when the country was making progress in the political, economic and social spheres. Indeed, the advent and strengthening of democracy have enabled the reinstatement of a climate of trust and a culture of patriotism among the population. The long-term objective of this Plan is to restore structural equilibrium to the Burundian economy through: (i) strengthening food self-sufficiency and diversifying exports through the promotion of agro-industrial, commercial and extractive businesses; (ii) developing the energy and crafts sectors, (iii) building and maintaining infrastructure to support growth; (iv) improving access to basic social services, in particular education, health and social protection; (v) pursuing environmental protection and land-use planning programs; (vi) improving financial governance and decentralization; and (vii) developing regional and international partnerships⁵⁷. The NDP has been updated to implement Burundi's new vision "Emerging country in 2040 and developed country in 2060". This vision will promote population growth that's compatible with the sustainable management of available resources.

⁵⁶ World Bank (2023 September, 25th). The World Bank in Burundi. <https://www.worldbank.org/en/country/burundi/overview>

⁵⁷ World Health Organization. Plan National de développement du Burundi 2018 - 2027. <https://extranet.who.int/mindbank/item/687>

TABLE 9: QI4SD DIMENSION AND P INDEX SCORES FOR BURUNDI

BURUNDI	Rank in Central Africa	Rank in Africa	QI4SD scores
QI4SD Index	1	22	18
Dimensions			
Standards			22
Conformity			1
Metrology			1
Accreditation			1
Policy			66
3-Ps			
People		30	1
Planet		28	2
Prosperity		29	2

According to **Tables 7 and 9**, Burundi has a QI4SD Index score of **18.2**, ranking it **108th** out of the 137 assessed countries. In its GDP group as a low income country, it has a rank of 6 out of 11. Within the Central African subregion, Burundi is ranked 1st out of the 2 countries and 22nd out of 31 African countries assessed. With regard to the five dimensions, Burundi has a value of 21.8 for Standardization, 1.0 for Conformity Assessment, 1.0 for Metrology, 1.0 for Accreditation, and 66.3 for Policy. Its best QI areas are policy and standardization.

Burundi has done well in the following areas:

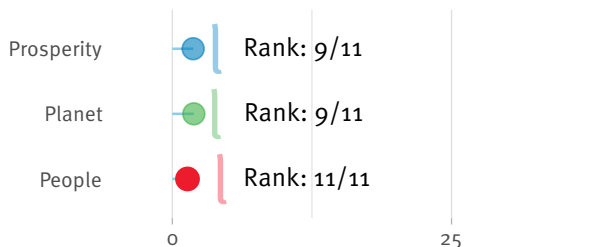
Strengths	Dimension	Rank	Value	Unit
Adopted IEC standards	Standards	38	30	Number
Membership of ITU	Standards	68	2	Composite score
Adopted ISO standards	Standards	85	1	Number

Some identified weaknesses which Burundi should focus on improving are as follows:

Weaknesses	Dimension	Rank	Value	Unit
Adopted ISO standards	Standards	85	1	Number
Participation in ISO technical committees	Standards	102	30	Number
Number of recognised certificates (ISO)	Conformity	136	20	Number

Within its GDP group, Burundi ranked on the three pillars of sustainable development (people, prosperity, and planet) as follows:

P-Scores



Based on the analysis of the QI4SD Index data, a recommendation for Burundi can be made:

- » **Testing Laboratories:** As the score for the Conformity Assessment dimension of Burundi is very low, strengthening testing laboratories capacities should be a top priority. Laboratories

can be supported by purchasing testing equipment, supplies and accessories to upgrade their product standard testing facilities in the laboratories and providing training to technicians on how to use the newly acquired equipment and on international laboratory testing requirements. In January 2024, the Laboratory for Soil Analysis and Food Products (LASPA) of the Institute of Agriculture Science of Burundi (ISABU) and the Chemistry Laboratory of Burundi's Bureau of Standards and Quality Control (BBN) achieved their ISO 17025 accreditation thanks to the Market Access Upgrade Program supported by the European Union. Other laboratories working in key sectors of the Burundian economy (health, agriculture, construction, etc.) could be similarly strengthened⁵⁸.

⁵⁸ International Trade Centre (2024). Burundi laboratories gain international recognition. <https://intracen.org/news-and-events/news/burundi-laboratories-gain-international-recognition>





CASE STUDY: GABON

Country	Gabonese Republic
Continent	Central Africa
Population	2.43 million (2023) ⁵⁹
GDP	USD 20.52 billion (2023)
GDP per capita	USD 8,420 (2023) ⁶⁰
Income Level – 2022	Upper-middle income
Human Development Index	0.706 (2021) ⁶¹
Value added by Agriculture, Forestry and Fishing	5.8% of GDP (2023) ⁶²
Value added by Industry	52.9% of GDP (2023)
Logistics Performance Index (overall)	2.4 (2023)
Global Competitiveness Index	119 out of 141 countries (2019)
Main Trade Agreements	WTO / CEMAC
Main exports – 2022	Crude petroleum (\$4.88B) / Manganese ore (\$1.83B) / Sawn wood (\$351M) / Veneer sheets (\$273M) / Refined petroleum (\$163M) ⁶³
Main trading partners	China, France, China, India, UAE, USA, South Korea, Congo, Belgium

⁵⁹ World Bank (2023). Population, total – Gabon. <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=GA>

⁶⁰ World Bank (2023). GDP per capita (current US\$). Gabon. <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=GA>

⁶¹ United Nations Development Programme. Human Development Report 2021-22. Uncertain Times, Unsettled Lives: Shaping our Future in a Transforming World. UNDP. <https://hdr.undp.org/content/human-development-report-2021-22>

⁶² World Bank (2023). Agriculture, forestry, and fishing, value added (% of GDP) – Gabon.

<https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=GA>

⁶³ Observatory of Economic Complexity. Country Profile-Gabon. OEC. <https://oec.world/en/profile/country/gab>

Located in Central Africa, Gabon boasts a wealth of natural resources. With a coastline on the Atlantic Ocean, Gabon is bordered by Cameroon, Equatorial Guinea and the Republic of Congo and enjoys an abundance of natural resources. Gabon has a very young population, with half of its 2.3 million inhabitants under 20. In 2022, Gabon's economy benefited from higher oil prices and solid commodity production. Growth reached 3.1%, reflecting a considerable recovery from the 2020 recession caused by the COVID-19 pandemic and fluctuations in oil prices. The economic recovery allowed for the reduction of the ratio of public debt to GDP from 60.7% in 2021 to 52% in 2022. While export performance has improved the trade balance, multiple challenges remain, such as cash management problems, high world food and energy prices leading to inflation rates rising from 1.1% in 2021 to 4.3% in 2022.

After having won a third term in the 2023 general elections, President Ali Bongo was deposed on 30 August 2023 following a military intervention driven by the Committee for the Transition and Restoration of Institutions (CTRI). This "coup d'état" has introduced some uncertainty into the nation's economic outlook. Prior to this political event, growth was expected at 2.8% for 2023-2025, thanks to several sectors including timber, oil palm, and manganese⁶⁴.

An official launch of the United Nations cooperation framework plan for the sustainable development of Gabon 2023-2027 took place in June 2023 in Libreville⁶⁵. The plan focuses on promoting good governance, supporting the transition to a green and blue economy, and equal opportunities and inclusion. The plan encourages the active participation of civil society, the private sector, and international partners in the implementation of programs and projects⁶⁶.

TABLE 10: QI4SD DIMENSION AND P INDEX SCORES FOR GABON

GABON	Rank in Central Africa	Rank in Africa	QI4SD scores
QI4SD Index	2	23	18
Dimensions			
Standards			42
Conformity			1
Metrology			1
Accreditation			1
Policy			44
3-Ps			
People		11	12
Planet		11	12
Prosperity		5	16

According to **Tables 7 and 10**, Gabon has a QI4SD Index score of **17.9**, ranking it **109th** out of the 137 assessed countries. In its GDP group as an upper-middle income country, it doesn't fare well with a relatively low rank of 45 out of 64. Within Africa, Gabon is ranked 23rd out of 31 African countries assessed. With regard to the five dimensions, Gabon has a value of 42.5 for Standardization, 1.4 for Conformity Assessment, 1.0 for Metrology, 1.0 for Accreditation, and 43.8 for Policy. Its best QI areas are policy and standardization. When compared with other upper-middle income countries, its dimensions scores are lower than the average of all countries belonging to the same income group.

Gabon has done well in the following areas:

Strengths	Dimension	Rank	Value	Unit
Adopted ISO standards	Standards	3	21	Number
Adopted IEC standards	Standards	5	342	Number
Membership of IQNet	Conformity	57	1	Composite score

⁶⁴ World Bank (2023 October, 12th). The World Bank in Gabon. <https://www.worldbank.org/en/country/gabon/overview>

⁶⁵ Groupe des Nations Unies pour le Développement Durable (2023 June). Plan-cadre de coopération des Nations Unies pour le développement durable au Gabon (2023 à 2027). <https://unsdg.un.org/fr/resources/plan-cadre-de-cooperation-des-nations-unies-pour-le-developpement-durable-au-gabon-2023>

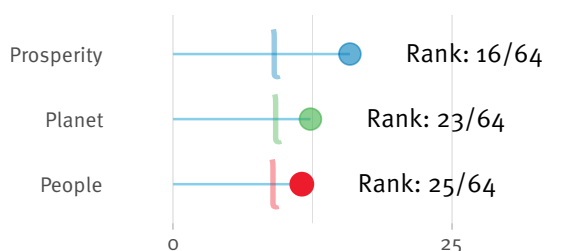
⁶⁶ Ministère des Affaires étrangères chargé de l'intégration sous-régionale et des gabonais à l'étranger (2023 June, 06). GABON-ONU : Développement durable : le Gabon et l'ONU s'accordent sur un plan-cadre 2023-2027. <https://www.affaires-etrangeres.gouv.ga/9-actualites/1543-gabon-ONU-developpement-durable-le-gabon-et-ONU-s'accordent-sur-un-plan-cadre-2023-2027/>

Some identified weaknesses which Gabon should focus on improving are as follows:

Weaknesses	Dimension	Rank	Value	Unit
Participation in ISO technical committees	Standards	113	21	Number
Number of recognised certificates (ISO)	Conformity	123	132	Number
Number of recognised certificates (IQNet)	Conformity	124	1	Number

Within its GDP group, Gabon ranked on the three pillars of sustainable development (people, prosperity, and planet) as follows:

P-Scores



Based on the analysis of the QI4SD Index data, a recommendation for Gabon can be made:

- » **Quality awareness campaigns:** In order to address the prevailing lack of awareness regarding the importance of quality in Gabon, it would be useful to conduct informative campaigns focused on standards, regulations, and NQI. These awareness campaigns should target both the general public and government institutions. Indeed, government institutions also need to fully comprehend the benefits associated with fostering a culture for quality and improving NQI, as this will contribute to the increased competitiveness of Gabonese products. Within the context of food safety, inspectors play a vital role in disseminating regulatory requirements to farmers and food businesses during their inspection visits, as they serve as the primary source of knowledge for ensuring compliance.

RECOMMENDATIONS

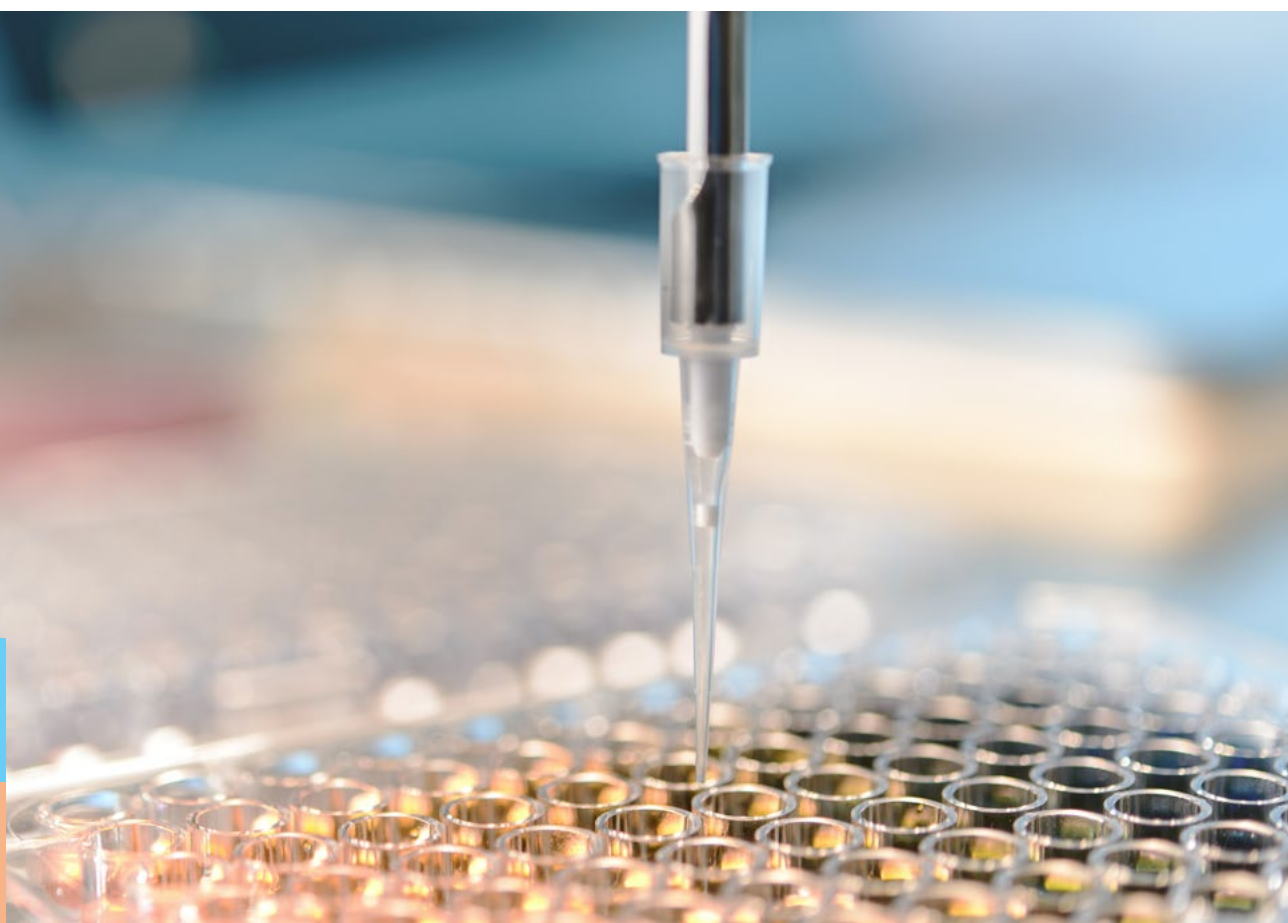
Based on the analysis of the QI4SD Index data, a recommendation for the Central African region can be made:

- » **CEMACNET:** CEMACNET is the Sub-regional Metrology Organization (SRMO) for the CEMAC countries. There are currently no Central African country which is a member of the International Bureau of Weights and Measures (BIPM) or associate of the General Conference on Weights and Measures (CGPM). Due to limited capabilities in its member countries, CEMACNET could follow the approach undertaken by the Secretariat for Metrology of the Economic Community of West African States (SOAMET) to provide measurement result traceability to the Central African region. As no single National Metrology Institute (NMI) is capable of providing traceability to the region, the strengths of NMIs and existing national measurement standards in member countries that could be developed to provide traceability to internationally stated references or the realization of the International System of Units (SI) could be identified. These measurement standards can then be recognized as “sub-regional measurement standards”. No single country would therefore need to realize all the base units but can focus on realizing one or two units and/or establishing the equivalence of one of a few high level measurement standards and thereby obtain traceability for the rest from countries in the sub-region. The sub-regional NMI can then function as a super NMI. One of the challenges in the implementation of this system is that national legislation should not only be aware of national measurement standards, but also of sub-regional measurement standards. In addition, at the international level, membership of the BIPM and an associate membership of the GCPM are established for individual country participation⁶⁷.

⁶⁷ E-medida. Building an African Metrology System, the Challenges and Successes. Revista Espanola de Metrologia. <https://www.e-medida.es/numero-8/building-an-african-metrology-system-the-challenges-and-successes/>



WESTERN AFRICA



According to the African Union's classification, the West African region covers 15 countries, namely, Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. All countries are members of the Economic Community of West African States (ECOWAS).

CONTEXT

After showing signs of improvements from the 2020 downturn, West Africa's average GDP growth slowed to 3.8% in 2022 from 4.4% in 2021. This deceleration was caused by several reasons, such as Russia's invasion of Ukraine causing pressures in net fuel, food and fertilizer, security-related challenges, and a resurgence of the Covid-19 pandemic in China, one of the major trade partners of West Africa. The only countries which have shown a GDP growth were Cabo Verde, The Gambia, Guinea, Mali, and Niger. Cabo Verde, thanks to its surge in tourism, registered the fastest growth of 10.5% in 2022 from 7% in 2021. Additionally, the region will need

to tackle the challenges caused by inflation woes⁶⁸. For instance, in November 2022, Nigeria's inflation rate hit 21.47%, a 17-year-high, increasing to 133 million the number of Nigerians living in poverty. Similarly, Senegal had to release millions to deal with soaring living costs and put price caps on essential products. Furthermore, the impact of climate change has been severe on the region with torrential rainfalls triggering floods in Nigeria, Ghana, Liberia, Niger, and Senegal.⁶⁹

ANALYSIS OF THE SUBREGION

The QI4SD Index framework covers **7 countries** in the West African region. **Figure 6** illustrates the QI4SD Index scores for the Western African countries included in the framework.

⁶⁸ African Development Bank Group (2023, July 31). West Africa Economic Outlook 2023. ADBG. <https://www.afdb.org/en/documents/west-africa-economic-outlook-2023>

⁶⁹ Al Jazeera. Issues in 2022. A recap of top issues in West Africa in 2022, including heated political campaigns and armed groups gaining ground. <https://www.aljazeera.com/news/2022/12/22/the-good-bad-and-the-ugly-west-africas-big-issues-in-2022>

Ghana, Togo, and Niger hold respectable ranks in Africa, securing the 8th, 14th, and 18th positions, respectively. However, the other four countries exhibit some of the lowest QI4SD scores on the continent. Among the seven West African countries, only four have a Policy score. It is noteworthy that three of these countries have attained a high policy score, with Niger achieving the highest score of 92. In the Standardization dimension, the scores are acceptable, with four countries scoring above the median Standardization score for African nations, which is 35. Unfortunately, the scores for the Conformity Assessment, Metrology, and Accreditation dimensions are notably low. In the case of Accreditation scores, all seven countries have a score of 1. It is worth

mentioning that the Index does not currently account for membership in regional accreditation bodies. Nevertheless, it should be noted that the following countries are members of the West African Accreditation System (SOAC): Cote d'Ivoire, Niger, Senegal, Mali, and Togo. In April 2022, SOAC achieved recognition as a signatory member of the African Accreditation Cooperation (AFRAC), specifically in areas related to testing and calibration laboratories (ISO/IEC 17025) and medical laboratories (ISO 15189)⁷⁰. The following month, SOAC entered into a Mutual Recognition Agreement (MRA) with ILAC. Therefore, in the second edition of the QI4SD Index, the Accreditation scores of the mentioned countries may improve.

⁷⁰ West Africa Competitiveness Programme. International recognition of the Regional Accreditation System: A new milestone toward a strong Quality Infrastructure in West Africa. WACOMP. <https://wacomp.ecowas.int/international-recognition-of-the-regional-accreditation-system-a-new-milestone-toward-a-strong-quality-infrastructure-in-west-africa/>

FIGURE 6: MAP OF THE WEST AFRICAN REGION BASED ON QI4SD INDEX SCORES

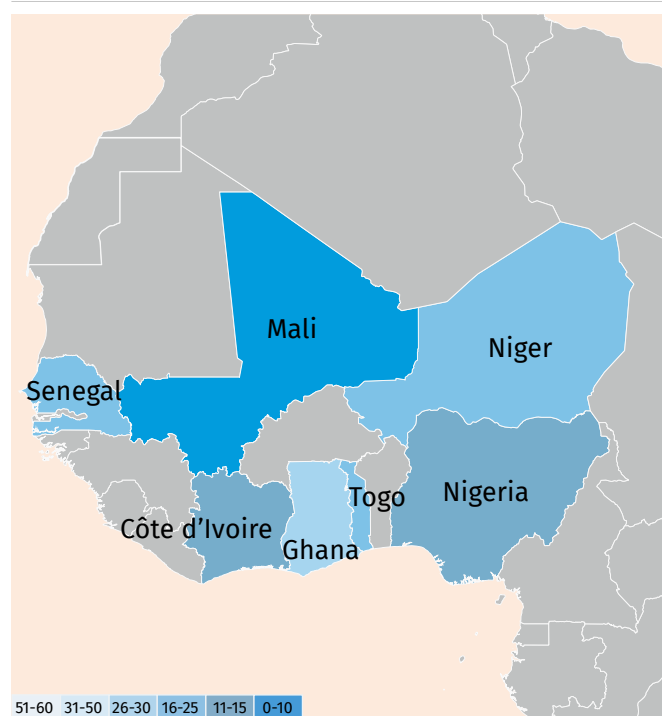


TABLE 12: P-INDEX RANKS FOR COUNTRIES IN WEST AFRICA

Country	People Rank	Planet Rank	Prosperity Rank
Ghana	7	12	9
Togo	5	4	4
Niger	26	25	26
Senegal	28	27	28
Nigeria	19	19	17
Côte d'Ivoire	25	16	12
Mali	30	30	31

TABLE 11: QI4SD INDEX SCORES FOR COUNTRIES IN WEST AFRICA

Country	Africa QI4SD Index Rank	Overall QI4SD Index Rank	Index	Standards	Conformity	Metrology	Accreditation	Policy
Ghana	8	76	30	44	2	15	1	88
Togo	14	89	26	40	1	1	1	85
Niger	18	94	23	18	1	1	1	92
Senegal	24	112	17	24	2	1	1	55
Nigeria	25	118	15	41	8	9	1	NA
Côte d'Ivoire	26	124	13	42	8	1	1	NA
Mali	30	134	9	24	1	8	1	NA
		min	7	15	1	1	1	44
		max	60	63	19	70	88	100



CASE STUDY: GHANA

Country	The Republic of Ghana
Continent	Western Africa
Population	34.12 million (2023)⁷¹
GDP	USD 76.37 billion (2023)⁷²
GDP per capita	USD 2,238 (2023)⁷³
Income Level – 2022	Lower-middle income⁷⁴
Human Development Index	0.632 (2021) Rank (133)⁷⁵
Economic Community	ECOWAS
Value added by Agriculture, Forestry and Fishing	21.1% of GDP (2023)⁷⁶
Value added by Industry	29.5% of GDP (2023)⁷⁷
Logistics Performance Index (overall)	2.5 (2023)⁷⁸
Global Competitiveness Index	51.2⁷⁹
Main Trade Agreements	iEPA (EU) / Opportunity Act (AGOA) / ECOWAS⁸⁰
Main exports – 2022	Gold (\$9.53B) / Crude petroleum (\$5.21B) / Cocoa beans (\$1.08B) / Coconuts, nuts, cashews (\$501M) / Cocoa paste (\$450M)⁸¹
Main trading partners	Switzerland / USA / India / China / India / Netherlands / Cote d'Ivoire

⁷¹ World Bank (2023). Population – Ghana. <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=GH>

⁷² World Bank (2023). GDP (current US\$) – Ghana. <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=GH>

⁷³ World Bank (2023). GDP per capita (current US\$) – Ghana. <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=GH>

⁷⁴ World Bank. World Bank Country and Lending Groups. <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

⁷⁵ United Nations Development Program (2022). Human Development Insights. Human Development Insights. UNDP. <https://hdr.undp.org/data-center/country-insights/#/ranks>

⁷⁶ World Bank (2023). Agriculture, forestry, and fishing, value added (% of GDP) - Ghana. The World Bank Data. <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=GH>

⁷⁷ World Bank (2023). Industry (including construction), value added (% of GDP) - Ghana. The World Bank Data. <https://data.worldbank.org/indicator/NV.IND.TOTL.ZS?locations=GH>

⁷⁸ World Bank. International LPI - Ghana. 2023. <https://lpi.worldbank.org/international/global>

⁷⁹ Schwab, K. World Economic Forum. 2019. The Global Competitiveness Report 2019. https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf

⁸⁰ International Trade Administration. (2022, September 22). Ghana Trade Agreements. <https://www.trade.gov/market-intelligence/ghana-trade-agreements>

⁸¹ Observatory of Economic Complexity. Country Profile-Ghana. OEC. <https://oec.world/en/profile/country/gha>

Ghana, formerly known as the Gold Coast, is a Western African country situated on the coast of the Gulf of Guinea and bordered to the northwest and north by Burkina Faso, to the east by Togo, to the south by the Atlantic Ocean, and to the west by Côte d'Ivoire. Although it is a relatively small country in terms of surface area and population, Ghana stands as one of the leading economies in Africa thanks to its considerable and abundant natural wealth⁸². Ghana currently also ranks in the top three African countries for freedom of speech and press and has made major advances towards having a fully-fledged functional democracy operating under a multi-party system⁸³.

As per the World Bank's assessment, Ghana is a **lower-middle income**⁸⁴ country with a Human Development Index (HDI) value of **0.632**,⁸⁵ which puts it in the Medium human development category—positioning it at 133 out of 191 countries and territories in 2021. Between 1990 and 2021, Ghana's HDI value rose from 0.460 to 0.632, representing an impressive growth of 37%. Nonetheless, the uneven distribution of human development reveals a decline of 27.5% in its HDI compared to the preceding year, 2020. For instance, Ghana continues to grapple with elevated levels of gender inequality, ranking at 130th place out of 170 countries in 2021 relative to the disparities between female and male achievements. This is further reflected by its Gender Inequality Index value of 0.529 recorded in 2021, indicating a marginal reduction from the value of 0.63 observed in 2019. The pervasiveness of this heightened inequality further manifests in regional divergences, with the southern region having better access to education, enhanced infrastructure, and greater income in comparison to the northern region.⁸⁶

The government, led by the New Patriotic Party (NPP), retained power in 2020 and is striving to deliver effective and efficient public services and work towards fiscal consolidation. Unfortunately, due to the drop in oil prices, the collapse in cocoa export revenues, and the COVID-19 pandemic, the country dove into an economic recession. In addition, Ghana's public accounts have deteriorated, with debt rising significantly from 63.9% of the GDP in 2019 to 78% of the GDP in 2021. It is therefore no wonder that Ghana continues to be classified as having a high risk of debt distress by the IMF.⁸⁷ In 2021, Ghana's economy managed to bounce back, achieving a growth rate of 5.4% growth, a significant improvement

compared to the 0.5% rate recorded in 2020. However, in early 2022, despite Ghana's ranking as the second biggest cocoa producer in the world, its currency (cedi) slumped to a more than 45% loss and inflation stood at a staggering 34% according to the Bank of Ghana.⁸⁸ These figures have had an adverse effect, plunging millions of Ghanaians into extreme poverty. In this current economic context, enacting the "Coordinated Programme of Economic and Social Development Policies (2017–2024)" spearheaded by the Government of Ghana will be difficult. Due to these mounting pressures, Ghana reached an agreement with the IMF of about USD 3B, which will allow Ghana to fund a programme aimed at restoring macroeconomic stability and debt sustainability while laying the foundation needed for a resilient and inclusive recovery.

TABLE 13: QI4SD DIMENSION AND P INDEX SCORES FOR GHANA

GHANA	Rank in West Africa	Rank in Africa	QI4SD scores
QI4SD Index	1	8	30
Dimensions			
Standards			44
Conformity			2
Metrology			15
Accreditation			1
Policy			88
3-Ps			
People		7	14
Planet		12	11
Prosperity		9	13

According to **Tables 11** and **13**, Ghana has a QI4SD Index score of **30**, positioning it as the **76th** out of the 137 assessed countries. In its GDP group as a middle income country, it ranks 21st out of 64 and 14th out of 33 in the lower-middle income country group. Within the West African subregion, Ghana stands as 1st out of 7 countries and 8th out of the 31 African countries assessed. With regard to the five dimensions, Ghana has a value of 43.9 for Standardization, 2.3 for Conformity Assessment, 15.3 for Metrology, 1 for Accreditation, and 87.6 for Policy. Its best QI areas are policy and standardization.

⁸² Britannica (2023). Ghana. <https://www.britannica.com/search?query=Ghana>

⁸³ World Bank. The World Bank In Ghana. <https://www.worldbank.org/en/country/ghana/overview>

⁸⁴ World Bank. World Bank Country and Lending Groups. <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

⁸⁵ United Nations Development Programme (2020). Human Development Report. The Next Frontier: Human Development and the Anthropocene. <http://hdr.undp.org/sites/default/files/Country-Profiles/GHA.pdf>

⁸⁶ Bertelsmann Stiftung's Transformation Index (2022.). BTI 2022 Country Report - Ghana. https://bti-project.org/fileadmin/api/content/en/downloads/reports/country_report_2022_GHA.pdf

⁸⁷ Coface. Risque Pays du Ghana: Economie. 2022. <https://www.coface.com/fr/actualites-economie-conseils-d-experts/tableau-de-bord-des-risques-economiques/fiches-risques-pays/ghana>

⁸⁸ Hyde, P. (2022). Ghana's Woeful Economic Crisis: The Challenges Ahead. Forbes Africa Forbes. <https://www.forbesafrica.com/economy/2022/11/02/ghanas-woeful-economic-crisis-the-challenges-ahead/>

Ghana has done well in the following areas:

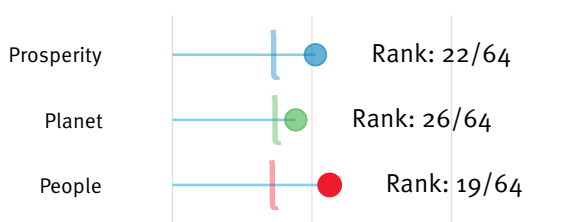
Strengths	Dimension	Rank	Value	Unit
Adopted IEC standards	Standards	2	470	Number
Membership of ITU	Standards	36	5	Composite score
Adopted ISO standards	Standards	55	9	Number

Some identified weaknesses which Ghana should focus on improving are as follows:

Weaknesses	Dimension	Rank	Value	Unit
Participation in key and supplementary comparisons	Metrology	80	9	Number
Participation in ISO technical committees	Standards	87	72	Number
Number of recognised certificates (IQNet)	Conformity	101	16	Number

Within its GDP group, Ghana ranked on the three pillars of sustainable development (people, prosperity, and planet) as follows:

P-Scores



Based on the analysis of the QI4SD Index data, some recommendations for Ghana can be made:

- » **Ghana National Accreditation Service:** In order for Ghanaian laboratories to be accredited in ISO/IEC 17025, they needed to be assessed and accredited by ILAC-recognized accreditation bodies. These were usually located in Europe and in the USA rendering the cost of accreditation to be quite high. Therefore, within the context of the QSP project, UNIDO has supported Ghana in establishing the Ghana National Accreditation Service (GhaNAS), which would provide accreditation services to Conformity Assessment Bodies (CABs). This would lower the cost of accreditation for Ghanaian CABs and lower the cost of tests needed to ensure the quality and safety of Ghanaian commodities. GhaNAS is also being supported in its efforts to become an internationally recognized Accreditation Body through membership of the International Accreditation Forum (IAF) and ILAC⁸⁹.
- » **Developing agri-based clusters:** To address the challenges faced by Ghanaian smallholders in meeting food safety standards and implementing good agricultural practices due to their economic circumstances, adopting a cluster approach through collaboration between small farmers can prove practical and cost-effective. The key challenge lies in effectively training a large number of farmers in good agricultural practices, providing them with incentives (financial and otherwise) to pursue certification, and educating them on the judicious use of chemicals. Emphasizing risk management education over crisis management is critical. This comprehensive training program requires effective coordination and clear delineation of responsibilities among relevant ministries and stakeholders, including NGOs and UN agencies. Furthermore, fostering stronger connections and cooperative efforts among all actors involved in agricultural production, packaging, and distribution is essential for enhancing the competitiveness of the agricultural sector. This entails identifying clusters, developing tools to optimize commercial operations, facilitating joint verification and transport processes, launching coordinated domestic and international marketing campaigns, and prioritizing the branding of Ghanaian products, among other strategies. The goal would also be to increase the number of SMEs certified in ISO 22000:2018, one of IQNet standards, as there are currently very few in West African countries⁹⁰.

⁸⁹ Public Sector Assurance. The establishment of a National Accreditation Body in Ghana to reduce the cost of internationally accredited laboratories in the country: Making laboratory accreditation more accessible in Ghana. <https://publicsectorassurance.org/case-study/the-establishment-of-an-national-accreditation-body-in-ghana-to-reduce-the-cost-of-internationally-accredited-laboratories-in-the-country-making-laboratory-accreditation-more-accessible-in-ghana/>
⁹⁰ IQNet. (2024). IQNet Database of Certified Organizations. <https://www.iqnet-certification.com/>

RECOMMENDATIONS

Based on the analysis of the QI4SD Index data as well as consultation with national stakeholders, some recommendations for the West African region can be made:

Product certification: The ECOWAS Product Certification Mark ECOQMARK is the regional mark created by ECOWAS to ensure compliance with its regulations. It is implemented by national Certification Bodies. As seven countries have yet to establish national certification bodies, support could be provided in setting them up to adopt ECOQMARK⁹¹. This would highly increase intra-regional trade as a company in Mali could have its product certified with ECOWAS ECOQMARK which would guarantee to local consumers the quality of the product along with allowing the product to be easily exported to another ECOWAS country⁹². As of June 2018, the following Product Certification Bodies (PCBs) have obtained international recognition of their competence through their accreditation to ISO/IEC 17065 by ACCREDIA, the Italian accreditation body: AVCN (Niger), ANM (Benin), CODINORM (Côte d'Ivoire) and ASN (Senegal). Furthermore, GSA, the Ghana PCB, as well as a private PCB in Côte d'Ivoire (BNA), have been accredited by DAKKS, the German accreditation body⁹³.

Food Safety Management System: As there are currently very few SMEs certified in the Food Safety Management System ISO 22000:2018, one of IQNet standards, one way to increase this number is to provide access to certification-ready postharvest infrastructure. This would allow agribusinesses to offer high quality produce to retailers on a regular and stable basis thank to having access to facilities that allow aggregation and primary processing activities, such as sorting, cleaning, packing, and storing the produce in cold storage. For instance, a Rwandan fresh produce distribution enterprise that acquired a certification-ready small-scale packhouse with cold storage and food processing facility, was able to obtain an ISO-22000 certification. After acquiring the certification, the SME's monthly sales have grown on average by 300% and its monthly revenue by 477%. This support could be provided to West African agri-business SMEs, thereby increasing the number of ISO-22000 certified SMEs in the West African region⁹⁴.

⁹¹ United Nations Industrial Development Organization. Adoption of the ECOWAS Certification Mark "ECOQMARK". UNIDO. <https://hub.unido.org/news/adoption-ecowas-certification-mark-ecoqmark>

⁹² Diop, A. (2021). Standards in the context of the African continental free trade area [Report]. <https://intracen.org/file/shetradesafctastandardsenpdf#:~:text=It%20should%20be%20noted%20that,that%20will%20deliver%20the%20mark>

⁹³ United Nations Industrial Development Organization. Knowledge Hub. Set up of the ECOWAS Standards Compliance Mark: Already six national product certification bodies ready to protect the West African consumer and strengthen Quality Infrastructure in the region. UNIDO. <https://hub.unido.org/news/set-ecowas-standards-compliance-mark-already-six-national-product-certification-bodies-ready-0>

⁹⁴ Shell Foundation. The 'cold chain' opportunity: reducing postharvest losses and increasing market access for rural farmers.





SOUTHERN AFRICA



According to the African Union's classification, the Southern African region covers nine countries, namely, Angola, Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia, South Africa, and Zambia⁹⁵. These nations are all members of the Southern African Development Community (SADC).

CONTEXT

In 2022, the Southern African region has seen an economic slowdown, with its GDP's growth reaching 2.7%, a level lower than the African average of 3.8%. Its largest economy, South Africa, has had multiple challenges from civil unrest, natural disasters, and an electricity crisis. Other countries besides South Africa experienced a similar slowdown, such as, Zimbabwe, Zambia, and Malawi. As the Covid-19 pandemic increased the rates of poverty in the region, per capita income

growth will be needed⁹⁶. The Southern African region is also one of the most vulnerable regions in the world to climate change. It experiences droughts, floods, and tropical cyclones, which reduce the availability of natural resources and undermine the region's development. This worsens livelihoods, increases food insecurity, and exacerbates the dynamics of ongoing conflicts.

ANALYSIS OF THE SUBREGION

The QI4SD Index framework covers **8 countries** in the South African region. Figure 7 illustrates the QI4SD Index scores for the Southern African countries included in the framework.

⁹⁶ African Development Bank Group. 2023 Southern Africa Economic Outlook: Southern Africa's economic prospects subdued, yet abounds with investment opportunity in climate change initiatives. <https://www.afdb.org/en/news-and-events/press-releases/2023-southern-africa-economic-outlook-southern-africas-economic-prospects-subdued-yet-abounds-investment-opportunity-climate-change-initiatives-63343>

⁹⁵ African Union. Member States. https://au.int/en/member_states/countryprofiles2

FIGURE 7: MAP OF THE SOUTH AFRICAN REGION BASED ON QI4SD INDEX SCORES

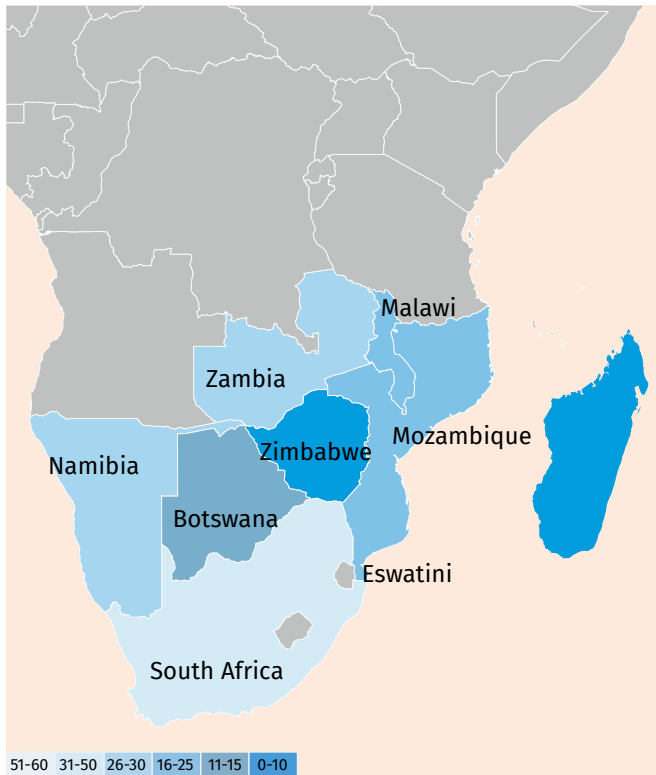


TABLE 15: P-INDEX RANKS FOR COUNTRIES IN THE SOUTHERN AFRICA REGION

Country	People Rank	Planet Rank	Prosperity Rank
South Africa	1	1	1
Zambia	13	9	16
Namibia	24	22	18
Malawi	14	18	13
Eswatini	18	20	20
Mozambique	21	23	23
Botswana	22	24	22
Zimbabwe	17	14	21

Based on **Tables 14 and 15**, South Africa holds the first place in Africa boasting the highest QI4SD Index score in the region. The country also holds the highest scores for the People index, the Planet index, and the Prosperity index. South Africa does however lack a Policy score. It would therefore be interesting to ensure that data is collected in the second edition of the index for the Policy dimension for South Africa and to check whether South Africa would still hold the top position. Besides Zambia which holds the 6th position, the other four

countries hold respectable ranks in the upper half of the rankings for Africa. Botswana and Zimbabwe however rank amongst the last. Among the eight Southern African countries, five have a Policy score. It is noteworthy that three of these countries have attained a high policy score, with Zambia achieving the highest score of 100. In the Standardization dimension, the scores are relatively low, with all countries except South Africa scoring below the median Standardization

TABLE 14: QI4SD INDEX SCORES FOR COUNTRIES IN SOUTHERN AFRICA

Country	Africa QI4SD Index Rank	Overall QI4SD Index Rank	Index	Standards	Conformity	Metrology	Accreditation	Policy
South Africa	1	20	60	63	19	70	88	NA
Zambia	6	73	31	28	1	27	1	100
Namibia	10	80	28	25	3	22	1	91
Malawi	13	88	26	34	1	8	1	84
Eswatini	16	92	23	22	2	1	1	92
Mozambique	17	93	23	21	2	8	1	82
Botswana	27	128	12	29	1	16	1	NA
Zimbabwe	29	132	11	32	1	8	1	NA
		min	7	15	1	1	1	44
		max	60	63	19	70	88	100



score for African nations, which is 35. Unfortunately, the scores for the Conformity Assessment dimension are very low. The scores for Metrology could also be improved as half of the countries scored 8 or lower. In the case of Accreditation scores, all countries except South Africa have a score of 1. All countries in the region are serviced by the Southern African Development Conformity Accreditation Services (SADCAS), which is an accreditation body established relative to the terms of Article 15 B of the Technical Barriers to Trade Annex to the SADC Protocol on Trade. Its main purpose is to ensure that conformity assessment bodies which are located in countries that do not have a national accreditation body, can still assure their technical competence through accreditation⁹⁷. In addition, the Southern Accreditation Development Cooperation in Accreditation (SADCA) is a cooperation of accreditation bodies in the SADC region. Its members are MAURITAS (Mauritius), SADCAS (representing 14 economies in the SADC region), and SANAS (South Africa). In March 2023, SADCA was recognized as a Regional Accreditation Cooperation by the ILAC MRA for the accreditation of calibration and testing laboratories using ISO/IEC 17025 and as a Regional Group by the IAF Multilateral Agreement (MLA) for the accreditation of Management System Certification Bodies using ISO/IEC 17021 for Quality Management Systems (QMS)⁹⁸. If the second edition of the QI4SD Index starts accounting for membership in regional accreditation bodies, countries in the Southern African region may see an improvement in their Accreditation scores.

⁹⁷ Groupe de la Banque Africaine de Développement. Perspectives économiques de l'Afrique australe 2023 : malgré des perspectives économiques moroses, l'Afrique australe regorge d'opportunités d'investissement face aux changements climatiques. <https://www.afdb.org/fr/news-and-events/press-releases/perspectives-economiques-de-lafrique-australe-2023-malgre-des-perspectives-economiques-moroses-lafrique-australe-regorge-dopportunités-dinvestissement-face-aux-changements-climatiques-63350>

⁹⁸ International Accreditation Forum. (2024). SADC Obtains its International Recognition. <https://iaf.news/2023/04/30/sadca-obtains-its-international-recognition/>



CASE STUDY: SOUTH AFRICA

Country	The Republic of South Africa
Continent	Southern Africa
Population	60.4 million (2023) ⁹⁹
GDP	USD 377.7 billion (2023)
GDP per capita	USD 6,253 (2023) ¹⁰⁰
Income Level - 2022	Upper-middle income
Human Development Index	0.71 (2021) ¹⁰¹
Value added by Agriculture, Forestry and Fishing	2.5% of GDP (2023) ¹⁰²
Value added by Industry	24.6% of GDP (2023)
Logistics Performance Index (overall)	3.7
Global Competitiveness Index	60 out of 141 countries (2019)
Main Trade Agreements	SACU / SADC / EAC / COMESA / AfCFTA
Main exports – 2022	Gold (\$22.7B), Platinum (\$19.1B), Coal Briquettes (\$12.7B), Cars (\$6.89B), and Diamonds (\$6.22B) ¹⁰³
Main trading partners	China / USA / Germany / India / Japan / Saudi Arabia

⁹⁹ World Bank (2023). Population, total – South Africa. <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=ZA>

¹⁰⁰ World Bank (2023). GDP per capita (current US\$). South Africa. <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=ZA>

¹⁰¹ Knoema (2021). The human development index of South Africa. <https://knoema.com/data/human-development-index+south-africa>

¹⁰² World Bank (2023). Agriculture, forestry, and fishing, value added (% of GDP) – South Africa. WB. <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=ZA>

¹⁰³ Observatory of Economic Complexity. Country Profile-South Africa. OEC. <https://oec.world/en/profile/country/zaf>

The economy of South Africa is the second largest in Africa (after Nigeria) and the most industrialized, technologically advanced, and diversified economy in Africa. South Africa is classified as an upper-middle income economy, a distinction shared with only eight other African nations. The dominant driver of economic growth since the 1990s has been the tertiary sector, encompassing activities such as wholesale and retail trade, tourism, and communications. Currently, South Africa is undergoing a transition towards a knowledge-based economy, with a heightened emphasis on technology, e-commerce, financial services, and other related industries. This shift is supported by key contributing sectors, including manufacturing, retail, financial services, communications, mining, agriculture, and tourism, which collectively keep the economic engine running and contribute to the country's gross domestic product¹⁰⁴. Despite some progress made in reducing poverty in South Africa since 1994, the trend was reversed between 2011 and 2015, which posed a threat to the gains achieved during this period. Currently, about 55.5% (equivalent to 30.3 million people) of the population is living in poverty, as measured by the national upper poverty line of approximately ZAR 992. Additionally, around 13.8 million individuals (25% of the population) are estimated to be experiencing food poverty. When assessed on an international scale using poverty lines of \$1.90 and \$3.20 per person per day (2011 PPP), the poverty rates in 2014/15 were estimated to be 18.9% and 37.6%, respectively. These figures represent an increase from the rates of 16.6% and 35.9% recorded in 2010/11¹⁰⁵.

Investing in public infrastructure is vital for increasing productivity and competitiveness, reducing inequality between regions, and promoting the growth of job-generating sectors. It is considered an essential element for achieving transformation and inclusive economic growth. The construction of infrastructure not only creates employment opportunities, but also supports the empowerment of historically disadvantaged individuals, aligning with the objectives of the National Development Plan (NDP). The NDP set a goal of reaching a 30% investment-to-GDP ratio, with one-third of this investment coming from the government. The current phase of the National Infrastructure Plan (NIP) 2050 focuses on four key network sectors: energy, freight transport, water, and digital infrastructure. A subsequent phase will concentrate on distributed infrastructure, municipal services, and strategies to enhance coordination through District Development Models (DDMs)¹⁰⁶.

¹⁰⁴ The Embassy of the Republic of South Africa. Key factors. <https://zuidafrika.nl/trade-investment/key-sectors/#>

¹⁰⁵ World Bank Group (2020, April). Poverty & Equity Brief. Sub-Saharan Africa. https://databankfiles.worldbank.org/public/ddpext/download/poverty/33EF03BB-9722-4AE2-ABC7-AA2972D68AFE/Global_POVEQ_ZAF.pdf

¹⁰⁶ Ellipsis (2022 November, 8). National Infrastructure Plan 2050 Phase 1. <https://www.ellipsis.co.za/national-infrastructure-plan-2050/>

TABLE 16: QI4SD DIMENSION AND P INDEX SCORES FOR SOUTH AFRICA

	Rank in Southern Africa	Rank in Africa	QI4SD scores
SOUTH AFRICA			
QI4SD Index	1	1	60
Dimensions			
Standards			63
Conformity			19
Metrology			70
Accreditation			88
Policy			
3-Ps			
People		1	55
Planet		1	49
Prosperity		1	55

According to **Tables 14** and **16**, South Africa has a QI4SD Index score of **60.1**, ranking it **20th** out of the 137 assessed countries. In its GDP group as an upper-middle income country, it fares well with a rank of 8 out of 46. Within the South African region, South Africa is ranked 1st out of the 8 countries and 1st out of 31 African countries assessed. With regard to the five dimensions, South Africa has a value of 62.9 for Standardization, 19.1 for Conformity Assessment, 70.0 for Metrology, 88.5 for Accreditation, and no data for Policy. Its best QI areas are accreditation, metrology, and standardization.

South Africa has done well in the following areas:

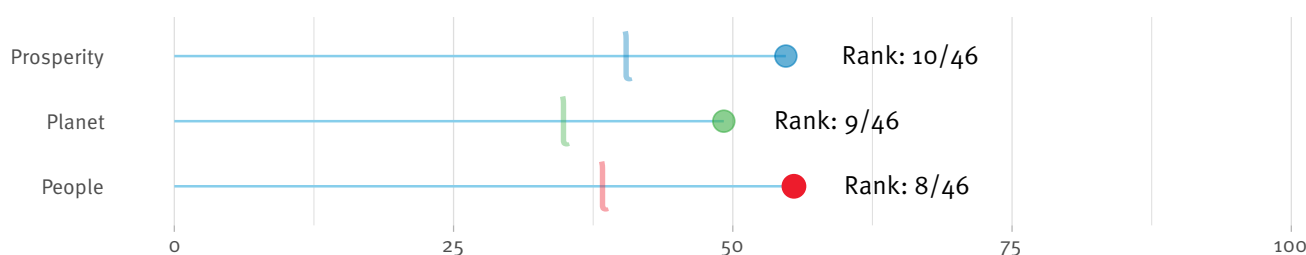
Strengths	Dimension	Rank	Value	Unit
Involvement in OIML project groups	Metrology	10	86	Composite score
Participation in BIPM Consultative Committees	Metrology	11	18	Number
Membership of ITU	Standards	11	15	Composite score

Some identified weaknesses which South Africa should focus on improving are as follows:

Weaknesses	Dimension	Rank	Value	Unit
Number of recognised certificates (ISO)	Conformity	32	7,230	Number
Scopes of IAF accreditation bodies	Accreditation	36	8	Number
Membership of IQNet	Conformity	57	1	Composite score

Within its GDP group, South Africa ranked on the three pillars of sustainable development (people, prosperity, and planet) as follows:

P-Scores



Based on the analysis of the QI4SD Index data, some recommendations for South Africa can be made:

» **IECEE CB Certification Scheme:** The IECEE CB Certification Scheme, established by the International Electrotechnical Commission (IEC), is a widely acknowledged system that enables the acceptance of test reports issued by National Certification Bodies participating in the scheme. This acceptance allows for the approval of market access in more than 50 countries across the globe¹⁰⁷. A National Certification Body (NCB) is an organization that provides nationally recognized conformity assessment certificates for electrical products. To become a member of the CB Scheme, an NCB must meet specific requirements regarding its internal quality system and technical expertise. There are two categories of NCBs: Recognizing NCBs and Issuing and Recognizing NCBs. Recognizing NCBs accept CB test certificates and reports as the basis for granting their own national product certification in specified product areas and standards. Issuing and Recognizing NCBs, on the other hand, are authorized to issue CB test certificates and reports, in addition to accepting those issued by other NCBs, for the same product categories and standards. As per the IEC, manufacturers participating in the CB scheme can anticipate several benefits. These include quicker acceptance of their products in international markets, thanks to faster movement from production to market. The CB Scheme rules ensure expedited handling of applications, resulting in time and cost efficiencies from faster testing and certification processes. Manufacturers can also save on workload, testing resources, and product samples at risk of damage or destruction, thanks to the reduced need for duplicated testing. For instance, in February 2022, the Kenya Bureau of Standards (KEBS) joined the IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components (IECEE) as a recognizing NCB. This means that KEBS now operates a national certification approval scheme, recognizing the IECEE test reports and certificates for electrical and electronic components, equipment, and products. Since becoming an IECEE NCB, KEBS has declared that 211 IEC Standards fall

¹⁰⁷ International Electrotechnical Commission. (2023, March 14). Promoting the benefits of IECEE in Africa. <https://www.iec.ch/blog/spreading-iecce-gospel-africa>

within their scope of recognition and has issued 32 product certificates¹⁰⁸. Similarly, the South African Bureau of Standards could consider the benefits of joining the IECEE CB Certification Scheme.

» **ISO 22000 Certification:** Obtaining ISO 22000 certification in South Africa is advantageous for companies as it provides a robust framework for implementing a strong food safety management system. The underlying principle of this certification is based on the Hazard Analysis & Critical Control Points (HACCP), which is a proactive approach to ensuring food safety. HACCP is a systematic system that identifies, evaluates, and controls food safety hazards. The goal would also be to increase the number of SMEs certified in ISO 22000:2018 in South Africa as this would help address the bacterial contamination issues facing the country.

Listeria monocytogenes is a foodborne pathogen that can cause listeriosis, a prevalent foodborne disease in humans and animals. In children, elderly, immunocompromised and pregnant people, it can lead to septicemia, meningitis and even be fatal. Between 2017 and 2018, one of the largest listeriosis outbreaks with 1,060 patients was reported in South Africa. It was due to a Ready-to-Eat (RTE) processed meat product. In fact, RTE foodstuffs are a prime source of *Listeria monocytogenes* contamination¹⁰⁹. For South African countries, efforts should be concentrated on the management and control of this safety hazard by implementing an effective food safety management system (FSMS), which would include environmental monitoring of processing facilities. In addition, regulatory agencies need to use finished product testing as well as environmental monitoring to verify that *L. monocytogenes* control strategies were implemented properly by Food Business Operators (FBOs).¹¹⁰

¹⁰⁸ Nemko. (2022, December 1). Recognizing the CB scheme for national certification. <https://www.nemko.com/blog/recognizing-the-cb-scheme-for-national-certification>

¹⁰⁹ Centorotola G, Ziba MW, Cornacchia A, Chiaverini A, Torresi M, Guidi F, Cammà C, Bowa B, Mtonga S, Magambwa P, D'Alterio N, Scacchia M, Pomilio F and Muuka G (2023, August 30th). *Listeria monocytogenes* in ready to eat meat products from Zambia: phenotypical and genomic characterization of isolates. *Frontiers*. Volume 14. <https://doi.org/10.3389/fmicb.2023.1228726>

¹¹⁰ Food and Agriculture Organization of the United Nations (2022). *Listeria monocytogenes* in ready-to-eat (RTE) foods: attribution, characterization and monitoring. Meeting Report. ISSN 1726-5274. FAO. <https://www.fao.org/3/cc2400en/cc2400en.pdf>



CASE STUDY: MOZAMBIQUE

Country	Republic of Mozambique
Continent	Southeastern Africa
Population	33.89 million (2023) ¹¹¹
GDP	USD 20.62 billion (2023)
GDP per capita	USD 608.4 (2023) ¹¹²
Income Level - 2022	Lower-middle income
Human Development Index	0.446 (2021) ¹¹³
Value added by Agriculture, Forestry and Fishing	26.7% of GDP (2022) ¹¹⁴
Value added by Industry	22.8% of GDP (2022)
Global Competitiveness Index	137 out of 141 countries (2019)
Main Trade Agreements	SADC / AGOA / GSP / WTO / GATT
Main exports – 2022	Coal Briquettes (\$3.45B) / Raw Aluminum (\$1.99B) / Coke (\$839\$) / Petroleum Gas (\$689M) / Gold (\$448M) ¹¹⁵
Main trading partners	India / South Africa / South Korea / Italy / China / Congo

¹¹¹ World Bank (2023). Population, total – Mozambique. <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=MZ>

¹¹² World Bank (2023). GDP per capita (current US\$). Mozambique. <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=MZ>

¹¹³ The Global Economy (2021). Mozambique: Human development. [https://www.theglobaleconomy.com/Mozambique/human_development/#:~:text=Human%20Development%20Index%20\(0%20%2D%201\)&text=The%20average%20value%20for%20Mozambique,184%20countries%20is%200.724%20points.](https://www.theglobaleconomy.com/Mozambique/human_development/#:~:text=Human%20Development%20Index%20(0%20%2D%201)&text=The%20average%20value%20for%20Mozambique,184%20countries%20is%200.724%20points.)

¹¹⁴ World Bank (2022). Agriculture, forestry, and fishing, value added (% of GDP) – Mozambique. <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=MZ>

¹¹⁵ Observatory of Economic Complexity. Country Profile-Mozambique. OEC. <https://oec.world/en/profile/country/moz>

Despite experiencing strong economic growth between 2000 and 2015, Mozambique still faces limitations in creating jobs, reducing poverty, and accumulating human capital. The benefits of this growth have primarily been enjoyed by specific sectors of the economy, rather than being widely spread. The country faces challenges related to maintaining macroeconomic stability due to its vulnerability to fluctuations in commodity prices. Additionally, Mozambique needs to enhance economic governance and transparency to regain confidence. Structural reforms are necessary to support the struggling private sector and diversifying the economy away from capital-intensive projects and low-productivity subsistence agriculture. This should be accompanied by efforts to strengthen key drivers of inclusion, such as enhancing the quality of education and health services. The national poverty rate experienced a significant surge from 48.4% to 62.8% during the period from 2014/15 to 2019/20, indicating a substantial increase in the number of people living in poverty from 13.1 million to 18.9 million. This change primarily reflects the adverse effects of the Covid-19 pandemic on families across the nation. Notably, urban areas have witnessed a disproportional rise in poverty levels. This can be attributed to the fact that, despite a general decline in consumption, urban areas have borne a more substantial brunt of the global pandemic due to the greater impact of restricted mobility and slower economic activity¹¹⁶.

The Government of Mozambique is committed to achieving inclusive and sustainable development through the adoption of an integrated approach to development planning and budgeting. To support this effort, a range of tools has been implemented with assistance from the Poverty-Environment Initiative, aimed at promoting the integration of sustainable development across national and sector plans and budgets. These tools include a planning matrix that addresses cross-cutting issues such as environment and gender, a budget code specifically dedicated to climate change, and capacity building initiatives for environmental focal points within sector ministries and the Ministry of Economy and Finance. The utilization of these tools and approaches has ensured that national and sector plans actively promote the inclusive and sustainable utilization of natural resources. For instance, efforts have been made to enhance sustainable practices in artisanal fishing, mitigate the environmental impacts of artisanal mining, promote conservation agriculture, and encourage the adoption of cleaner energy sources as alternatives to charcoal. Additionally, the country's five-year national development plan (PQG) for 2015-2019 placed significant emphasis on one of its five priority areas: the sustainable and transparent management of the environment and natural resources, with a particular focus on reducing the vulnerabilities of local communities to the effects of climate change¹¹⁷. The Five-Year Programme 2020-

2024 focuses on the maintenance of peace, inclusive and sustainable growth, economic and social stability, greater productivity and competitiveness.

TABLE 17: QI4SD DIMENSION AND P INDEX SCORES FOR MOZAMBIQUE

MOZAMBIQUE	Rank in Southern Africa	Rank in Africa	QI4SD scores
QI4SD Index	6	17	23
Dimensions			
Standards			21
Conformity			2
Metrology			8
Accreditation			1
Policy			82
3-Ps			
People		21	7
Planet		23	5
Prosperity		23	5

According to **Tables 14** and **17**, Mozambique has a QI4SD Index score of **22.7**, ranking it **93rd** out of the 137 assessed countries. In its GDP group as a low-income country¹¹⁸, it has a rank of 33 out of 64. Within the Southern African subregion, Mozambique is ranked 6th out of the 8 countries and 17th out of 31 African countries assessed. With regard to the five dimensions, Mozambique has a value of 21 for Standardization, 1.5 for Conformity Assessment, 8.1 for Metrology, 1 for Accreditation, and 82 for Policy. Its best QI area is policy followed by Standardization.

Mozambique has done well in the following areas:

Strengths	Dimension	Rank	Value	Unit
Membership of IQNet	Conformity	57	1	Composite score
Adopted ISO standards	Standards	63	8	Number
Number of recognised certificates (IQNet)	Conformity	78	82	Number

¹¹⁶ The World Bank. The World Bank in Mozambique. IBRD-IDA. <https://www.worldbank.org/en/country/mozambique/overview>

¹¹⁷ United Nations Environment Programme. Using an integrated approach to eradicate Poverty in Africa: Case From Mozambique. UNEP. <https://www.unep.org/news-and-stories/story/using-integrated-approach-eradicate-poverty-africa-case-mozambique-0>

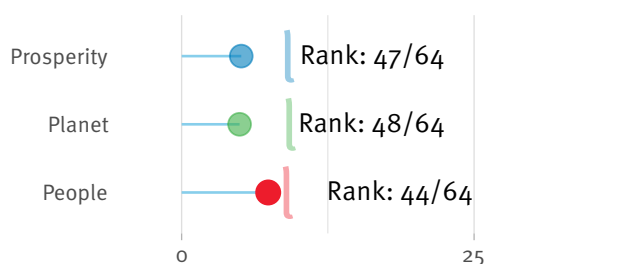
¹¹⁸ World Bank. World Bank Country and Lending Groups. <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

Some identified weaknesses which Mozambique should focus on improving are as follows:

Weaknesses	Dimension	Rank	Value	Unit
Membership of ITU	Standards	79	1	Composite score
Participation in ISO technical committees	Standards	125	9	Number
Number of recognised certificates (ISO)	Conformity	129	86	Number

Within its GDP group, Mozambique ranked on the three pillars of sustainable development (people, prosperity, and planet) as follows:

P–Scores



Based on the analysis of the QI4SD Index data, some recommendations for Mozambique can be made:

- » **Standards promotion and development:** Even though the number of standards sold in Mozambique has increased slightly over the years (275 standards in 2012 versus 396 in 2015), it remains below the number expected of an economy of the size of Mozambique. Thus, there is a need to promote SMEs, consumer associations, farmers, etc. getting involved in standards' development, which can be achieved by:
 - » Launching trainings, workshops, and coaching programs on standards, on the role of accredited conformity assessment activities and practical methodologies on how to implement standards.
 - » Introducing success stories to SMEs, farmers and SME associations in order to stimulate their interest in taking an active part in the national work on drafting/adopting standards. Active participation in Technical Committees keeps them up to date with what happens to standards in their field and may encourage them to provide proposals for standards of domestic products.

Most European and international standards are adopted in Mozambique through a method of confirmation, which presents a significant challenge for businesses as the original language is English. This language barrier hinders the use of these standards in their activities. Therefore, there is a pressing need to translate these standards into Portuguese. Additionally, there is potential to enhance the situation by facilitating the selection of necessary standards for companies, including SMEs, enabling them to choose internationally relevant standards for entering international markets¹¹⁹.

- » **ISO Technical Committees Participation:** Developing International Standards and other ISO deliverables is carried out by ISO technical committees and their subcommittees. Technical Committees (TC) develop strategic business plans analyzing the needs of the market and showing how they'll be addressed by the work of the TC. Standards can also be developed by Project Committees. Project Committees usually only develop one standard before disbanding or transforming into a TC if there's a need for further standardization work. As all ISO member bodies are eligible for membership in any ISO TC, project committee or subcommittee as either participating members (P-members) or observers (O-members), Mozambique has the opportunity to increase its participation in TC¹²⁰. There are many benefits in joining an ISO TC such as being able to influence the development of standards in a particular sector, gaining an early understanding of upcoming changing to standards, learning about the latest technical innovation and market trends, influencing the use of standards as an alternative to legislation and regulation, etc.¹²¹

RECOMMENDATIONS

Based on the analysis of the QI4SD Index data, some recommendations for the Southern African region can be made:

- » **Energy Efficiency Standards:** Several countries in the Southern African region have launched energy efficiency strategies, including Chad, Lesotho, Malawi, and Sierra Leone. However, there's a low implementation rate for Minimum Energy Performance Standards (MEPS) and labelling and a lack of regulation enforcing compliance. In 2019, the African Union Commission (AUC)

¹¹⁹ United Nations Industrial Development Organization (2019). Annex I: Description of the Action. Promove Comercio – Building Competitiveness for Exports. UNIDO. https://downloads.unido.org/ot/21/32/21320614/Annex%20I_PROMOVE%20MOZ_ProDoc%2021%2011%202019.pdf

¹²⁰ International Organization for Standardization. (2018). My ISO job – What delegates and experts need to know. https://www.iso.org/files/live/sites/isoorg/files/archive/pdf/en/my_iso_job.pdf

¹²¹ British Standards Institution. The benefits in getting involved in developing standards – Help improve the quality of life for millions of people. <https://www.bsigroup.com/Documents/about-bsi/committee-members/BSI-committee-member-brochure-the-benefits-of-getting-involved-in-developing-standards-UK-EN.pdf>

started implementing a strategy and action plan for a “Harmonized Regulatory Framework for the Electricity Market” in Africa. One of the pillars of the action, Pillar 5, focuses on establishing norms, standards, and frameworks for energy efficiency. The Regional Economic Communities (RECs) and the Regional Renewable Energy and Energy Efficiency Centres (RREEECs) will collaborate to support African countries in the implementation of the MEPS and Labels of appliances. They will also support the establishment of regional appliance testing laboratories. For instance, for the product categories of refrigeration and air-conditioning equipment, the most important testing standards and competence for testing and calibration are IEC 62552:2015 – Household refrigeration appliances – Characteristics and test methods; ISO 5151:2017 – non-ducted air conditioners and heat pumps – Testing and rating for performance; ISO/IEC 17025:2005 – General requirements for the competence of testing and calibration laboratories. These standards should be adopted to national standards by Southern African countries.¹²²

- » **Energy-efficiency Policy:** In 2013, on behalf of the ECOWAS Commission, ECREEE adopted an energy-efficiency policy framework to support its member states in reducing their carbon footprint. Each member country developed a National Energy Efficiency Policy, which included the following three components: Energy efficiency in buildings, energy efficiency in industry, and energy efficiency standards and labels. In the industrial sector, countries are implementing Energy Management Standards based on the ISO 50001 standard and are training energy auditors and supporting the certification of industries on energy management systems, and the implementation of ISO 14000. A similar energy-efficiency policy could be developed for SADC countries¹²³.

¹²² Physikalisch-Technische Bundesanstalt. National Metrology Institute. Quality Infrastructure for Climate Change Mitigation and Adaptation to Climate Change. PIB. https://www.ptb.de/cms/fileadmin/internet/fachabteilungen/abteilung_9/9.3_internationale_zusammenarbeit/publikationen/PTB_Study_QI_Climate_Change_Africa_EN_.pdf

¹²³ United States Agency for International Development (2022, June 24th). Energy-efficiency opportunities in sub-saharan Africa – Scaling-up renewable energy (SURE). USAID. https://pdf.usaid.gov/pdf_docs/PA00ZJFN.pdf





REGIONAL ECONOMIC COMMUNITY CASE STUDY – SOUTHERN AFRICAN DEVELOPMENT COMMUNITY



The Southern African Development Community (SADC) comprises 16 member countries, namely, Angola, Botswana, Comoros, the Democratic Republic of Congo (DRC), Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zambia, and Zimbabwe.

CONTEXT

With the primary goal of coordinating development projects to reduce economic dependence on the then-apartheid South Africa, the Southern African Development Coordination Conference (SADCC) was established in 1980 as a loose alliance of nine States in Southern Africa, namely Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia, and Zimbabwe. On 1 April 1980, in Lusaka in Zambia, the Lusaka Declaration (Southern Africa: Towards Economic Liberation) was adopted, thereby establishing SADCC. On 17 August 1992, the Declaration and Treaty were signed during the Summit of Heads of State and Government, granting the organization legal status. Thus, SADCC became the South African Development Community (SADC)¹²⁴.

The SADC region's economy steadily recovered from the declining effects of the COVID-19 pandemic while navigating through a volatile international environment brought on by wars, unfavorable climate conditions, and tightening of global financial conditions worldwide. In 2022, SADC's GDP growth reached 2.7%, a level lower than the global and African averages of 3.4% and 3.8% respectively. This is a decline compared to the 4.5% growth rate achieved in 2021. Growth is expected to decline further in 2023 to 1.6%, with a hope of improvement to reach 2.7% in 2024. Unfortunately, the per capita income growth in the majority of SADC countries is lower than the growth rate needed to reverse the increase of poverty, which was caused by the pandemic. This slow performance is also due to ongoing political and structural issues in South Africa, which bring down regional growth along with Russia's invasion of Ukraine, which continues to put pressure on food and energy prices.

After being named the SADC region's top-priority engine of growth to propel industrialization over the next several decades, the manufacturing sector grew by 5.8% in 2021 but only by 1.6% in 2022. After 2013, the growth of the manufacturing sector and the GDP as a whole both trended downward until 2020, then upward in 2021 before declining in 2022. With a manufacturing sector GDP share of 11.2% in 2022, it is almost exactly the same as it was in 2013. On the other hand, the agricultural sector, which is crucial for both social and economic development, grew by 3% in 2022 after growing by 5.3% in 2021. This industry, which provides food, income, and jobs for about 70% of the population in the area, contributed 8.4% of the GDP in 2022. In 2022, the primary sector, which includes mining and

quarrying, forestry, agriculture, and accommodation and food service activities, accounted for 24.6% of the GDP in the SADC region, while the tertiary sector, which includes all other service industries, transportation, and storage, contributed 57.1%. With a GDP share of 18.3%, the secondary sector included manufacturing, gas, electricity, steam, air conditioning, and water supply, as well as remediation and waste management from sewers, and construction. The GDP contribution of these economic sectors has not changed significantly over the past ten years, with the exception of a slight increase in the primary sector from 2013 to 2022¹²⁵.

The SADC region has been struggling with the effects of climate change. For instance, the ongoing El Niño-induced drought is severely affecting the lives and livelihoods of approximately 61.7 million people in the SADC region, putting the region once again in the grip of a humanitarian crisis. Alongside the drought, there have been landslides and flash floods caused by the heavy rains from tropical cyclones, causing extensive damage to Madagascar and parts of Mozambique. The cyclones also had unintended consequences in Tanzania, Malawi, Mozambique, and Eswatini, where intense rains produced flash floods that destroyed property and forced many to flee their homes. Over 9,000 cattle have died as a result of the El Niño-induced drought and over 1.4 million cattle are thought to be at high risk of dying in Zimbabwe due to a lack of pasture and water. Water shortages have also resulted in crop failure and decreased vegetation growth for livestock and wildlife. There have been more human-wildlife conflicts that have resulted in fatalities due to the shortage of water and pasture. Water-borne diseases like cholera, which have already afflicted several SADC countries including the Democratic Republic of the Congo (DRC), Malawi, Mozambique, Zambia, and Zimbabwe and claimed over 3,000 lives between 2023 and 2024, are more likely to occur as a result of unsafe water sources¹²⁶.

¹²⁴ African Union. Southern African Development Community (SADC). <https://au.int/en/recs/sadc>

¹²⁵ Southern African Development Community. SADC Macroeconomic Statistics Bulletin Year 2022. SADC. https://www.sadc.int/sites/default/files/2023-12/Macroeconomic%20Report_2022.pdf

¹²⁶ ReliefWeb (2024, June 5). SADC Regional Humanitarian Appeal. Response of the El Nino induced drought and floods – May 2024. <https://reliefweb.int/report/zimbabwe/sadc-regional-humanitarian-appeal-response-el-nino-induced-drought-and-floods-may-2024>

ANALYSIS OF THE REGIONAL ECONOMIC COMMUNITY

The QI4SD Index framework covers **12 countries** in SADC. Figure 8 illustrates a map of the SADC countries.

FIGURE 8: MAP OF THE SADC COUNTRIES

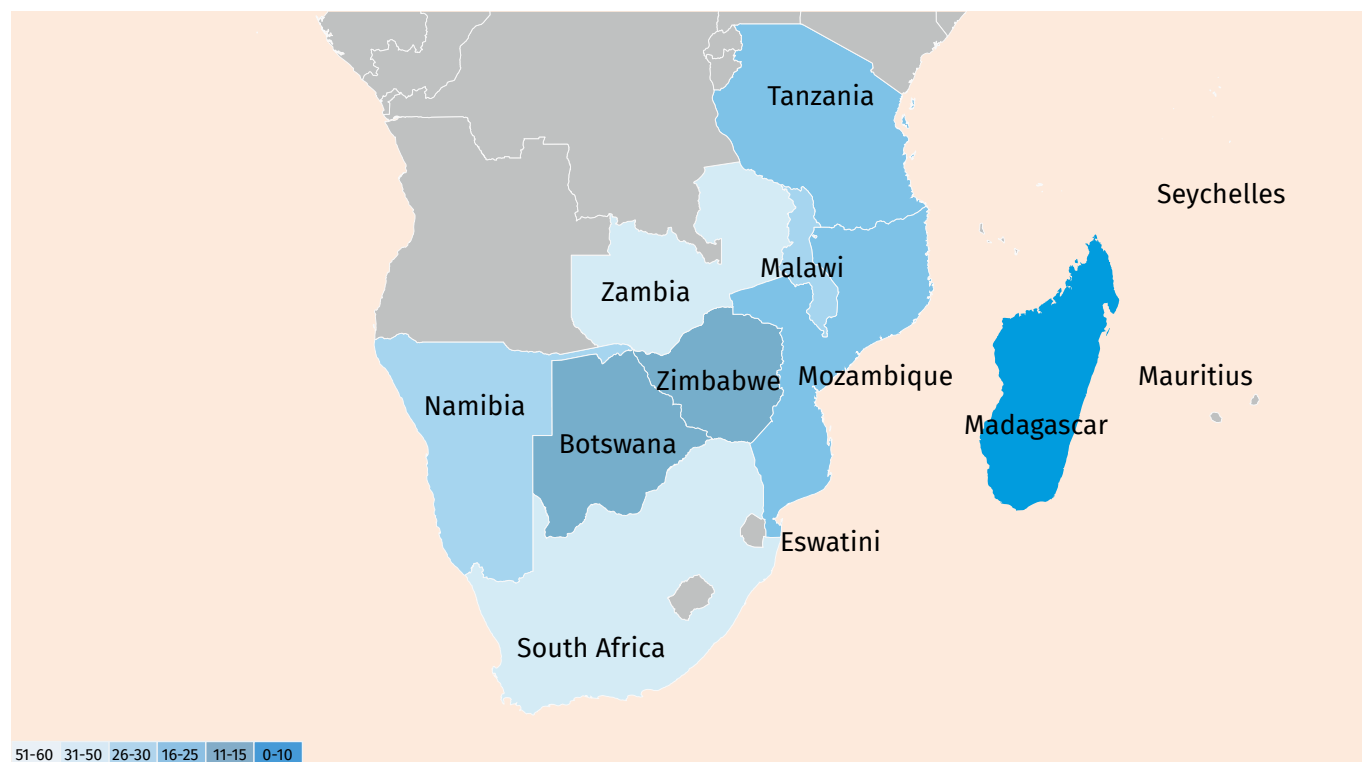


TABLE 18: QI4SD INDEX SCORES FOR SADC COUNTRIES

Country	Africa QI4SD Index Rank	Overall QI4SD Index Rank	Index	Standards	Conformity	Metrology	Accreditation	Policy
South Africa	1	20	60	63	19	70	88	NA
Zambia	6	73	31	28	1	27	1	100
Namibia	10	80	28	25	3	22	1	91
Mauritius	11	84	28	32	2	15	62	NA
Malawi	13	88	26	34	1	8	1	84
Eswatini	16	92	23	22	2	1	1	92
Mozambique	17	93	23	21	2	8	1	82
Seychelles	19	99	21	21	1	16	1	68
Tanzania	20	101	21	32	1	24	1	47
Botswana	27	128	12	29	1	16	1	NA
Zimbabwe	29	132	11	32	1	8	1	NA
Madagascar	31	137	7	16	2	8	1	NA
		min	7	15	1	1	1	44
		max	60	63	19	70	88	100

TABLE 19: P-INDEX RANKS FOR SADC COUNTRIES

Country	People Rank	Planet Rank	Prosperity Rank
South Africa	1	1	1
Zambia	13	9	16
Namibia	24	22	18
Mauritius	6	5	8
Malawi	14	18	13
Eswatini	18	20	20
Mozambique	21	23	23
Seychelles	16	21	25
Tanzania	20	15	19
Botswana	22	24	22
Zimbabwe	17	14	21
Madagascar	27	29	27

Based on **Tables 18 and 19**, South Africa holds the first place in Africa, boasting the highest QI4SD Index score among SADC countries. The country also holds the highest scores in the People index, the Planet index, and the Prosperity index. However, South Africa lacks a Policy score. Following South Africa, Zambia secures the second-highest rank among African countries, ranking at 6. Half of the countries in the region have QI4SD Index scores in the upper half for Africa, while the other half belongs to the lower half. In particular, Botswana, Zimbabwe, and Madagascar rank at the bottom of the group. Of the twelve SADC countries, seven have a Policy score, with six of them achieving substantially high scores in this dimension. Zambia garners the highest score of 100. In the Standardization dimension, most countries hover around the median score for African nations, which stands at 35. After the Policy dimension, Standardization can be considered one of the strongest areas for SADC countries.

On the other hand, the scores for the Conformity Assessment dimension are very low, with South Africa having the highest score at 19, while the rest of the countries score only 1 or 2. Scores for Metrology would also need to improve, as half of the countries scored 8 or lower. In Accreditation scores, all countries, except South Africa and Mauritius, have a score of 1. It is worth noting that all countries in the region are served by the Southern African Development Conformity Accreditation Services (SADCAS), an accreditation body established in accordance with Article 15 B of the Technical Barriers to Trade Annex to the SADC Protocol on Trade. Its primary objective is to assure the technical competence of conformity assessment bodies located in countries

without a national accreditation body¹²⁷. Additionally, the Southern Accreditation Development Cooperation in Accreditation (SADCA) is a cooperation of accreditation bodies in the SADC region. Its members are MAURITAS (Mauritius), SADCAS (representing 14 economies in the SADC region), and SANAS (South Africa). In March 2023, SADCA was recognized as a Regional Accreditation Cooperation by the ILAC MRA for the accreditation of calibration and testing laboratories using ISO/IEC 17025 and as a Regional Group by the IAF Multilateral Agreement (MLA) for the accreditation of Management System Certification Bodies using ISO/IEC 17021 for Quality Management Systems (QMS)¹²⁸. As previously mentioned, if the second edition of the QI4SD Index considers membership in regional accreditation bodies, member countries of SADC would see an improvement in their Accreditation scores.

RECOMMENDATIONS

Based on the analysis of the QI4SD Index data as well as consultation with national stakeholders, some recommendations for SADC countries can be made:

- » **Metrology services across the components of the agricultural value chain:** The metrology dimension scores for SADC countries are quite low. In addition, as the agriculture sector continues to be vital for SADC's economy and the livelihoods of its large rural population, the improvement of metrological services related to that sector would be very beneficial. First, at the **pre-production** (agricultural inputs - seeds, fertilizers and pesticides) level, metrological services play a crucial role in ensuring the quality control of agricultural inputs. In countries where these services are not readily available, farmers and service providers have to rely on calibration services offered in other countries. This leads to increased costs and longer turnaround times. Therefore, in many SADC countries, farmers, supporting organizations, and laboratories do not calibrate all the relevant equipment, resulting in a lack of traceability and precision within the sector. Metrology in chemistry also holds relevance in this context, as it provides traceability for determining the active ingredients in fertilizers and pesticides, among other applications. In terms of legal metrology, the verification of balances and scales is imperative

¹²⁷ Groupe de la Banque Africaine de Développement. Perspectives économiques de l'Afrique australe 2023 : malgré des perspectives économiques moroses, l'Afrique australe regorge d'opportunités d'investissement face aux changements climatiques. <https://www.afdb.org/fr/news-and-events/press-releases/perspectives-economiques-de-lafrique-australe-2023-malgre-des-perspectives-economiques-moroses-lafrique-australe-regorge-dopportunités-dinvestissement-face-aux-changements-climatiques-63350>

¹²⁸ International Accreditation Forum. (2024). SADC Obtains its International Recognition. <https://iaf.news/2023/04/30/sadca-obtains-its-international-recognition/>

to ensure accurate product weights, particularly for items such as pesticides at the point of sale. Second, at the **production** (management of soil nutrients and carbon, water, pests and diseases) level, metrological services play an important role in agricultural water management by ensuring the accuracy and reliability of various equipment used in this domain. Calibration services are essential for water meters employed in irrigation, as well as for measuring water quality parameters. The calibration of piezometers used to determine groundwater levels through hydrostatic pressure along with the calibration of soil humidity testing equipment are both required. Furthermore, type approval of commonly used equipment such as flow meters and piezometers is necessary to ensure their suitability and appropriateness. At the farm level, the availability of properly calibrated instruments can assist farmers in optimizing water application according to crop water requirements. In terms of soil nutrient and carbon management, calibration services for testing equipment used to determine physical and chemical soil parameters are essential. These services help farmers make informed decisions about crops and ensure the correct application of inputs. Inadequate knowledge of soil characteristics can result in plant stress and production losses. For pest management, calibration services and type approvals for volumetric equipment, flow meters, and pumps used in pesticide application are needed. In terms of chemical metrology, the calibration of equipment for determining pesticide residues in agricultural produce, the production of reference materials, and the organization of round-robin tests are necessary. Without access to these services, the proper application of agrochemicals cannot be guaranteed, thus limiting their effectiveness. Moreover, excessive doses of agrochemicals can have adverse effects on the health of farmers, agricultural workers, consumers, and ecosystems. Third, at the **post-harvest** level, post-harvest storage facilities play a key role in ensuring the quality of agricultural products. Challenges in maintaining these facilities include the proper management of temperature, humidity, and cleanliness, as well as maintaining effective drying facilities to achieve optimal moisture content for the stored goods. To address these challenges, metrological services involve the calibration of testing equipment to accurately determine weight, temperature, humidity, and moisture content in agricultural commodities. It is essential to ensure precise calibration of equipment as inaccurate measurements can lead to the loss of stored produce and pose health risks to consumers through the growth of mycotoxins. The absence of traceability and precision in measurements can also create challenges in later stages of the value chains. This can adversely affect transport conditions, compromising the quality and safety of products, consequently reducing competitiveness in both national and international markets.

» **Conformity Assessment services across the components of the agricultural value chain:** The conformity assessment dimension scores for SADC countries are very low. Improving the quality of the conformity assessment services in the agricultural sector, a key sector that drives social and economic development, would prove worthwhile. First, at the **pre-production** (agricultural inputs - seeds, fertilizers and pesticides) level, testing capacities are needed to assess the quality of agricultural inputs by determining the critical quality parameters for seeds (such as moisture content, germination, and purity), fertilizers (including macro- and micronutrients), and the active ingredients found in pesticides which should comply with international standards. While testing laboratories in SADC countries may have the capacity to test soil parameters, including nutrient content, humidity levels, and acidity, they often fail to comply with international testing standards. Therefore, enhancing the quality management of these laboratories and aiming to affirm their technical competence through accreditation is key. Developing and implementing certification and labelling schemes for agricultural inputs is a vital task to ensure market transparency for these products. This process involves designing the scheme based on international standards and establishing and strengthening certification bodies. Inspection services also hold a significant role in guaranteeing the quality assurance of available inputs. For instance, in many SADC countries, the actual content of active ingredients in fertilizers varies widely from what is indicated on the packaging. This discrepancy leads to incorrect application, either excessive or insufficient use of fertilizers. Thus, implementing systematic product inspections would improve this situation. The lack of efficient control procedures for imported agricultural seeds and fertilizers poses a significant obstacle to local markets in Africa. Establishing registration schemes for fertilizers, pesticides, and seeds, based on global standards and supported by competent laboratories, can streamline inspection procedures, reduce costs for producers, and consequently lower prices for local farmers. Second, at the **production** (management of soil nutrients and carbon, water, pests and diseases) level, field-level testing of soil and water quality parameters holds significant importance in optimizing water and soil management practices by determining the appropriate dosage of agrochemicals and irrigation scheduling. As access to testing laboratories is limited in rural areas, a viable option for farmers is the development and distribution of field test kits. Proper training to farmers on the correct usage of these test kits and sampling techniques would need to be provided. Certification schemes for good agricultural practices, such as Global G.A.P and Organic Farming, can serve as essential instruments in promoting climate-smart agricultural practices, improving farmers' market access, and enhancing the value of their produce. However,

smallholder farmers face challenges in accessing international certification schemes due to their high costs, technical and reporting requirements, and limited market access, which reduces their incentives. Alternatively, the development of regional capacities, such as accredited certification bodies, or the creation of regional or national certification schemes based on local standards for good practices can be viable options. For example, the Sustainable Agriculture Standard developed by the Sustainable Agriculture Network and the Rainforest Alliance (RAS 2017) is a certification scheme for climate smart agricultural practices in developing countries. Building inspection capacities for water and environmental authorities, with a specific focus on controlling agricultural water abstraction from surface and groundwater, is also critical. This becomes particularly important in areas where investments in irrigation are anticipated to adapt agricultural production to climate change. Inspection services are necessary to monitor compliance with regulations related to the safety of agricultural workers, especially related to the use of agrochemicals. Third, at the **post-harvest** level, testing services required for maintaining appropriate storage conditions encompass monitoring temperature, humidity, and weight. Assessing the moisture content of stored commodities is crucial for evaluating the efficiency of the drying system. It is also important to conduct tests for mycotoxins and residues of fungicides or other conditioning agents to ensure the food safety of stored goods. However, many SADC countries currently lack reliable testing services for mycotoxins and relevant residues. In the short term, the demand for such testing services in these areas can be met by regional laboratories. Nevertheless, in the long term, it is imperative to develop these testing capacities at the national level. Regular inspections of post-harvest storage facilities by competent authorities are essential to ensure compliance with sanitation regulations. Additionally, inspections of stored produce play a vital role in guaranteeing adherence to food safety regulations. Unfortunately, inspection bodies in SADC countries often face issues related to insufficient capacities and training, resulting in inadequate control of post-harvest processes. This can lead to significant losses of agricultural produce and pose health risks for consumers¹²⁹.



¹²⁹ Physikalisch-Technische Bundesanstalt. National Metrology Institute. Quality Infrastructure for Climate Change Mitigation and Adaptation to Climate Change. PIB. https://www.ptb.de/cms/fileadmin/internet/fachabteilungen/abteilung_9/9.3_internationale_zusammenarbeit/publikationen/PTB_Study_QI_Climate_Change_Africa_EN_.pdf






This report focuses on analyzing the QI4SD Index data for African countries and providing recommendations for each African subregion. It also provides country case studies for each subregion as well as a Regional Economic Community case study. The recommendations primarily center around improving the conformity assessment and metrology fields. Some of the specific recommendations include harmonizing regional standards, establishing proficiency testing programs for laboratories, supporting the development of National Quality Policies, assisting SMEs in obtaining ISO certifications, particularly ISO 22000, disseminating and developing trade digital tools, developing sub-regional measurement standards based on the strengths of NMIs and existing national measurement standards, increasing access to certification-ready postharvest infrastructure, joining the IECEE CB Certification Scheme, promoting and developing ISO standards, and increasing participation in ISO Technical Committees, etc.

The QI4SD Index data can be utilized in various ways. In-depth analysis of the scores for each indicator can be used to create Country Reports or Regional Reports that focus on analyzing the data for specific dimensions of the Index. Further research opportunities include comparing or combining data from other indexes, such as the Global Quality Infrastructure Index, the Global Competitiveness Index, the Logistics Performance Index, and the Global Sustainability Competitiveness Index, etc. Furthermore, following the launch of the Index's first edition and the QI4SD Index platform in June 2022, valuable feedback was received from international and national QI experts. Extensive discussions on the Index's methodology and data took place during an EGM conducted in November 2023. Based on the input gathered, a comprehensive review of the QI4SD methodology began in 2024, along with a new phase of data collection. The aim is to launch the Second Edition of the Index by the end of 2024.

ANNEX

QI4SD is a multidimensional concept and is decomposed into five dimensions that are captured with the following 36 indicators (Type “G” refer to “general indicators” and Type “P” refer to “P-indicators”):

DIMENSION	NAME	DESCRIPTION	UNIT	ORGANISATION	TYPE	WEIGHT
 ACCREDITATION	Scopes of IAF accreditation bodies	Number of scopes for the IAF Multilateral Recognition Arrangement mapped into the 3Ps.	Number	IAF	P	1
	Signatory to the IAF MLA	Existence of an accreditation body that is a signatory to the IAF Multilateral Recognition Arrangement.	Yes/no	IAF	G	1
	Scopes of ILAC accreditation bodies	Number of scopes for the ILAC Mutual Recognition Arrangement mapped into the 3Ps.	Number	ILAC	P	1
	Signatory to the ILAC MRA	Existence of an accreditation body that is a signatory to the ILAC Mutual Recognition Arrangement.	Yes/no	ILAC	G	1
 CONFORMITY	Membership of IEC conformity assessment systems	Country membership in the four IEC conformity assessment systems (IECEE, IECEx, IECRE, IECQ), range 0 to 4.	Number	IEC	G	1
	Number of IECEE certificates recognised	Number of IECEE certificates present in country.	Number	IEC	G	1
	Number of recognised certificates (IQNet)	Number of recognised certificates from IQNet database mapped into 3Ps.	Number	IQNet	P	0.5
	Membership of IQNet	Level of involvement in IQNet, location of head, subsidiary offices and origin of Certification Bodies.	Composite score	IQNet	G	1
	Number of recognised certificates (ISO)	Number of recognised certificates from ISO database mapped into 3Ps.	Number	ISO	P	0.5
 METROLOGY	Participation in CIPM Consultative Committees	Sum of overall participation in ten Consultative Committees, range 0 to 20.	Number	BIPM	G	1
	Participation in key and supplementary comparisons	Sum of the scores for the key and supplementary comparisons.	Number	BIPM	G	1
	Number of CMCs	Total number of Calibration and Measurement Capacities (CMCs) in any area mapped into 3Ps.	Number	BIPM	P	0.5
	Breadth of CMCs	Total breadth of Calibration and Measurement Capacity (CMC) types with at least one capacity mapped into 3Ps	Number of types	BIPM	P	0.5
	Membership of BIPM	Membership of BIPM, range 0 to 2.	Categorical	BIPM	G	1
	Membership of OIML	Membership of OIML, range 0 to 2.	Categorical	OIML	G	1
	OIML-CS - number of services offered	Number of OIML Certification System (CS) services offered.	Number	OIML	G	0.5
	OIML-CS - number of services recognised	Number of OIML Certification System (CS) services recognised.	Number	OIML	G	0.5
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	1	





 POLICY

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 of types	UNIDO/ISO	G	1
Quality Policy in place	National or regional Quality Policy in place, a policy for developing and sustaining effective QI.	Yes/no	UNIDO/ISO	G	1
Dimensions of QI addressed by Quality Policy	QI dimensions (Metrology, Standards, Accreditation, Conformity Assessment) addressed by the Quality Policy or regulatory framework, range 0 to 4.	Number	UNIDO/ISO	G	1
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	G	1
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/no	UNIDO/ISO	G	1
Government approval of Quality Policy	Quality Policy approved by government or regional country grouping.	Yes/no	UNIDO/ISO	G	1
Stakeholder involvement of Quality Policy	Involvement of stakeholders from the private and public sectors, consumers, producers in the Quality Policy process.	Yes/no	UNIDO/ISO	G	1
Consideration of diversity in Quality Policy	Gender balance and other diversity aspects considered in the Quality Policy process.	Yes/no	UNIDO/ISO	G	1
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/no	UNIDO/ISO	G	1
Monitoring and evaluation for Quality Policy	Mechanism(s) for monitoring and/or evaluating the implementation/outcomes of the Quality Policy.	Yes/no	UNIDO/ISO	G	1
Reviewing and updating for Quality Policy	Mechanism(s) for periodically reviewing and updating the Quality Policy.	Yes/no	UNIDO/ISO	G	1

 STANDARDS

Adopted ISO standards	ISO standards that had been adopted as national standards and mapped into the 3Ps.	Number	ISO	P	1
Adopted IEC standards	IEC standards that have been adopted and mapped into the 3Ps.	Number	IEC	P	1
Membership of IEC	Membership of the IEC, range 0 to 3.	Categorical	IEC	G	1
Participation in IEC technical committees	IEC technical committees (TCs) participation mapped into the 3Ps.	Number	IEC	P	1
Membership of ISO	Membership of the ISO, range 0 to 3.	Categorical	ISO	G	1
Participation in ISO technical committees	ISO technical committees (TCs) participation.	Number	ISO	G	1
Membership of ITU	Composite score of membership of ITU.	Composite score	ITU	G	1

The 3Ps (People, Planet and Prosperity) indexes are composed of the following 4 dimensions and 9 indicators:

DIMENSION	NAME	DESCRIPTION	UNIT	ORGANISATION	TYPE	WEIGHT
 ACCREDITATION	Scopes of IAF accreditation bodies	Number of scopes for the IAF Multilateral Recognition Arrangement mapped into the 3Ps.	Number	IAF	P	1
	Scopes of ILAC accreditation bodies	Number of scopes for the ILAC Mutual Recognition Arrangement mapped into the 3Ps.	Number	ILAC	P	1
 CONFORMITY	Number of recognised certificates (IQNet)	Number of recognised certificates from IQNet database mapped into 3Ps.	Number	IQNet	P	0.5
	Number of recognised certificates (ISO)	Number of recognised certificates from ISO database mapped into 3Ps.	Number	ISO	P	0.5
 METROLOGY	Number of CMCs	Total number of Calibration and Measurement Capacities (CMCs) in any area mapped into 3Ps.	Number	BIPM	P	0.5
	Breadth of CMCs	Total breadth of Calibration and Measurement Capacity (CMC) types with at least one capacity mapped into 3Ps.	Number of types	BIPM	P	0.5
 STANDARDS	Adopted ISO standards	ISO standards that had been adopted as national standards and mapped into the 3Ps.	Number	ISO	P	1
	Adopted IEC standards	IEC standards that have been adopted and mapped into the 3Ps.	Number	IEC	P	1
	Participation in IEC technical committees	IEC technical committees (TCs) participation mapped into the 3Ps.	Number	IEC	P	1



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