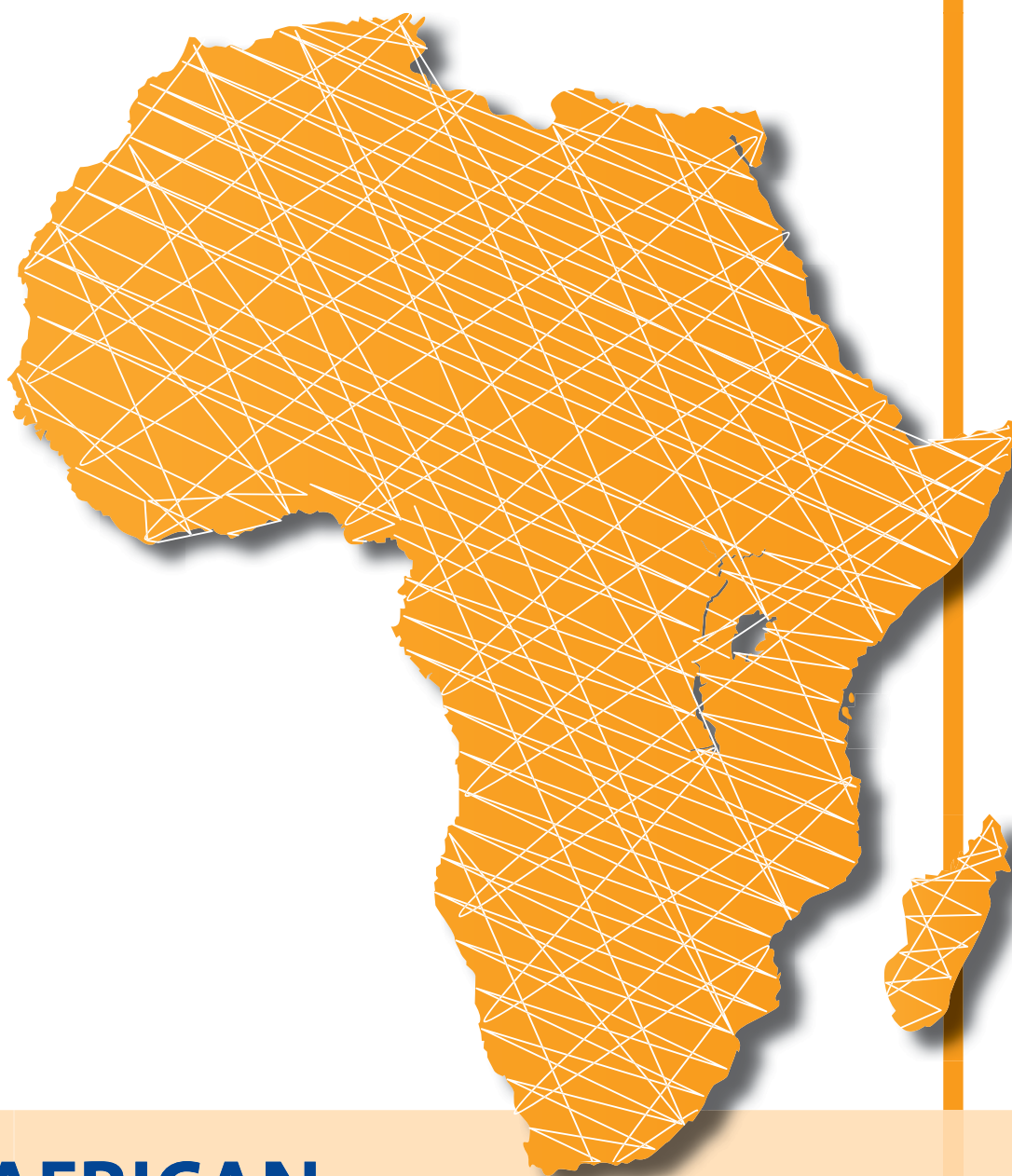


QUALITY FOR AFRICA

2017 
AFRICAN YEAR OF
QUALITY INFRASTRUCTURE



PAN-AFRICAN QUALITY INFRASTRUCTURE

**Stocktaking Document
– 2017 –**

The PAQI initiative is supported by



ACKNOWLEDGEMENT



The stocktaking study of the status of Quality Infrastructure in Africa, conducted in 2014, revealed important data on how African countries are committed to the development of effective Quality Infrastructure at all levels. It is time to update the data to measure the progress of the development of Quality Infrastructure by the African Countries.

The second phase of the stocktaking exercise to assess the advancement of accreditation; metrology and measurements and standardization in Africa and has been conducted by the Pan African Quality Infrastructure (PAQI) through its pillars, African Accreditation Cooperation (AFRAC), Intra-Africa Metrology System (AFRIMETS), African Electrotechnical Standardization Commission (AFSEC) and African Organisation for Standardisation (ARSO).

It is for this reason that I am delighted to express my gratitude to everyone who has been involved in this exercise particularly those from AFRAC, AFRIMETS, AFSEC and ARSO. My special thanks go to the African Union Commission (AUC) for the vital support in promoting Quality Infrastructure related matters in Africa. I am also extending my gratitude to PTB Germany for the continuous support to PAQI and especially for facilitating the refining and printing of this document.

Furthermore I would also like to acknowledge with much appreciation the crucial role of the National Quality Infrastructure Institutions who helped to assemble the parts and gave suggestion about this document.

Hermogène Nsengimana, PhD

Chairperson, Pan-African Quality Infrastructure (PAQI)

Secretary General, African Organisation for Standardisation (ARSO)

This document is available at www.paqi.org



PREFACE

The official launch of the Pan African Quality Infrastructure (PAQI) by the African Union Commission in August 2013 signalled not only the start of very necessary collaboration between continental quality infrastructure (QI) institutions, but also strengthened cooperation between PAQI and the African Union Commission (AUC). As part of the fulfilment of the 'PAQI Strategic Plan Aligned to the AUC Strategic Plan', the PAQI Joint Committee launched the 2014 edition of the QI Stocktaking document which has been the main reference document on QI situational analysis in the Continental Free Trade Area (CFTA) process. QI Stocktaking is very useful in informing the development of strategies to address non-tariff barriers particularly technical barriers to trade (TBTs) and Sanitary and Phytosanitary (SPS) measures in the CFTA.



As part of PAQI's celebration of the year 2017 as the African Year for Quality Infrastructure, the PAQI Joint Committee has released the 2017 edition of the PAQI Stocktaking document. The publication is timely and welcome. It not only gives the most current information on QI in Africa but when read with the 2014 edition, changes that have taken place in the last three years can be clearly identified. Concerning investments in QI between 2014 and 2017, a positive trend has been observed for 32 African countries. Sixteen countries have kept their QI system relatively stable without significant changes. Two countries have shown a slight downswing. Affected by the unstable political and security situation, Libya has unsurprisingly been ranked two grades lower than its position in 2014. The net effect is that about 50%; 5% more than in 2014; of African countries now have national QI systems that can be assessed to be in compliance with international requirements.

The QI Stocktaking series of publications by PAQI will continue to be an important source of data that effectively contributes to the formulation of African policy on trade and industrialization as well as directing QI technical assistance and capacity building programmes on the continent. PAQI will continue working closely with the AUC in providing QI related support to all continental developmental programmes. AUC calls on Member States to increase their material and financial support to national quality infrastructures.

Ambassador Albert M MUCHANGA

African Union Commissioner for Trade and Industry

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LIST OF ACRONYMS

AFRAC	African Accreditation Cooperation
AFRIMETS	Intra-Africa Metrology System
AFSEC	African Electrotechnical Standardization Commission
ARAC	Arab Accreditation Cooperation
ARSO	African Organization for Standardisation
AU	African Union
AUC	African Union Commission
BIAT	Boosting Intra African Trade
BIPM	International Bureau of Weights and Measures
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
CFTA	Continental Free Trade Area
CGPM	General Conference on Weights and Measures
CIPM	International Committee for Weights and Measures
CMC	Calibration and Measurement Capabilities
ECOWAS	Economic Community of West African States
EURAMET	European Association of National Metrology Institutes
IAF	International Accreditation Forum
IEC	International Electrotechnical Commission
ILAC	International Laboratory Accreditation Cooperation
ISO	International Organization for Standardization
KCDB	Key Comparison Data Base
LM	Legal Metrology
LMBs	Legal Metrology Bodies
MAA	Mutual Acceptance Arrangement
MRA	Mutual Recognition Arrangement
NABs	National Accreditation Bodies
NECs	National Electrotechnical Committees
NMIs	National Metrology Institutes
NSBs	National Standards Bureaus
OIML	International Organization of Legal Metrology
PAQI	Pan-African Quality Infrastructure
PTB	Physikalisch-Technische Bundesanstalt (The National Metrology Institute of Germany)
QI	Quality Infrastructure
RECs	Regional Economic Communities
RMO	Regional Metrology Organization
SADC	Southern Africa Development Community
SADCAS	SADC Accreditation Service
SI	System of Units
SPS	Sanitary and Phytosanitary
SRMO	Sub-regional Metrology Organizations
TBT	Technical Barriers to Trade
UNECA	United Nations Economic Commission for Africa

1. INTRODUCTION

In this beginning of a new era of Quality Infrastructure (QI) development, that focuses on “Boosting Intra African Trade (BIAT)”, it is clear that Quality Infrastructure components are the backbone of manufacturing of quality and safe goods and thus trade both regionally and globally.

Countries are advised to adopt and implement internationally recognized and accepted metrology, accreditation and standardization systems that are the basis of the Quality Infrastructure. The implementation is usually achieved through conformity assessment which is the internationally recognized mechanism for demonstrating that specified requirements relating to a product, process, system, person or body are fulfilled.

The Pan-African Quality Infrastructure (PAQI), recognized by the AU in August 2013, is the African platform on quality matters and operates through its pillars, African Accreditation Cooperation (AFRAC), Intra-Africa Metrology System (AFRIMETS), African Electrotechnical Standardization Commission (AFSEC) and African Organisation for Standardisation (ARSO).

In 2014 PAQI conducted a stocktaking exercise to establish a baseline of the status and gaps in accreditation, metrology and measurements and standardisation in Africa. It is now time for review and update of the data provided in the previous document. Except AFRAC the review uses similar indicators and criteria as was used in the previous research. This provides for a comparative analysis to better observe the change in the development of quality infrastructure in Africa.

After clustering the 2017 results in the respective fields of interest, the Secretariat of the PAQI Joint Committee has compiled all categories again to one PAQI status index. Of particular interest is the comparative analysis, which is shown at the end of Chapter 2.

1.1 African Accreditation Cooperation (AFRAC)

The African Accreditation Cooperation (AFRAC) was established in 2010 and is a cooperation of accreditation bodies, sub-regional accreditation cooperation and stakeholders.

The mission of AFRAC is to cooperate in building capacity in African accreditation with the goal of sustaining an internationally acceptable mutual recognition.

The main objective of AFRAC is to provide accreditation support to industry and trade and to contribute to the protection of health and safety of the public and the protection of the environment, in Africa and thereby improve Africa's competitiveness.

In order to facilitate trade accreditation needs to breakdown the technical barrier caused by differing standards and conformity assessment requirements. Thus using accredited conformity assessment services has the following advantages:

- Avoid expensive re-testing, re-certification or re-inspection when products are traded
- Avoids costly rework;
- Facilitate ease of access to the international market through a network of Mutual Recognition Arrangements (MRA)

AFRAC has 5 Arrangement Members. Arrangement Members are all independent accreditation bodies appointed or recognised by the government of the Member State or sub-regional block and legally established and operating in the African region that declare in their membership application that they are operating in accordance with the requirements of ISO/IEC guides and standards, the relevant international documents (ILAC and IAF) and the requirements of AFRAC. Arrangement Members are accreditation bodies who have been peer evaluated under applicable AFRAC Procedures and found to comply by the MRA Council with the requirement for admission as a Signatory to the AFRAC MRA.

CATEGORY	CRITERIA
1 Fully operational Accreditation Body and/or ILAC/IAF signatory	<ul style="list-style-type: none"> • Official body responsible for accreditation • Signatory to the ILAC and IAF Mutual , Multi-Lateral Arrangement (MRA/MLA) • Signatory to the AFRAC and/or ARAC MRA/MLA
2 Fully operational Accreditation Body and signatory to the AFRAC MRA and/or ARAC MLA	<ul style="list-style-type: none"> • Official body responsible for accreditation • Not a signatory to the ILAC or IAF Arrangement • Signatory to the AFRAC and/or ARAC Arrangement
3 Fully operational Accreditation Body and associate member to the ILAC/IAF and/or full member of AFRAC and/or ARAC	<ul style="list-style-type: none"> • Official body responsible for accreditation • Not a signatory to the ILAC/IAF/AFRAC or ARAC arrangements • Associate member of ILAC and or IAF • Full member of AFRAC and/or ARAC
4 Establishment of an accreditation body in progress	<ul style="list-style-type: none"> • In process of establishing an accreditation infrastructure; • Affiliate member of AFRAC and/or ARAC
5 No official institute responsible for accreditation	<ul style="list-style-type: none"> • No official accreditation infrastructure in place or under development

Table 1: Classification criteria for accreditation (2017)



Figure 1: AFRAC stocktaking

CATEGORY	COUNTRY
1	Egypt, South Africa and Tunisia Covered by SADC Accreditation Services (SADCAS) a multi-economy accreditation body: Angola, Botswana, DR Congo, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Seychelles, Swaziland, Tanzania, Tunisia, Zambia and Zimbabwe
2	Algeria and Ethiopia
3	Kenya, Libya, Mauritius and Morocco
4	Ghana, Mauritania and Nigeria Covered by SOAC (West Africa Accreditation Body) a multi-economy accreditation body: Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal and Togo
5	Countries not mentioned above

Table 2: Classification of capabilities in accreditation

Note: Cabo Verde, The Gambia, Guinea, Liberia, Sierra Leone are Member States of ECOWAS. According to ECOWAS Regulation C/REG.19/12/13 on Quality Infrastructure Scheme, ECOWAS should ensure that all accreditation services are available in the region. To this end, MoUs could be signed between these countries & national or multi economies accreditation bodies in operation within the region.

AFRAC comparison – 2014/2017

NO	COUNTRY	AFRAC 2014	AFRAC 2017
1	ALGERIA		
2	ANGOLA		
3	BENIN		
4	BOTSWANA		
5	BURKINA FASO		
6	BURUNDI		
7	CAMEROON		
8	CAPO VERDE		
9	CENTRAL REPUBLIC OF AFRICA		
10	CHAD		
11	COMOROS		
12	CONGO REPUBLIC		
13	COTE D'IVOIRE		
14	DEMOCRATIC REPUBLIC OF CONGO		
15	DJIBOUTI		
16	EGYPT		
17	ERITREA		
18	ETHIOPIA		
19	EQUATORIAL GUINEA		
20	GABON		
21	GAMBIA		
22	GHANA		
23	GUINEA		
24	GUINEA BISSAU		
25	KENYA		
26	LESOTHO		
27	LIBERIA		
28	LIBYA		

NO	COUNTRY	AFRAC 2014	AFRAC 2017
29	MADAGASCAR		
30	MALAWI		
31	MALI		
32	MAURITANIA		
33	MAURITIUS		
34	MOROCCO		
35	MOZAMBIQUE		
36	NAMIBIA		
37	NIGER		
38	NIGERIA		
39	RWANDA		
40	SAO TOME AND PRINCIPE		
41	SENEGAL		
42	SEYCHELLES		
43	SIERRA LEONE		
44	SOMALIA		
45	SOUTH AFRICA		
46	SOUTH SUDAN		
47	SUDAN		
48	SWAZILAND		
49	TANZANIA		
50	TOGO		
51	TUNISIA		
52	UGANDA		
53	WESTERN SAHARA		
54	ZAMBIA		
55	ZIMBABWE		

Table 3: AFRAC comparison – 2014/2017

1.2 Intra-Africa Metrology System (AFRIMETS)

The Intra-Africa Metrology System (AFRIMETS) was formed in 2006 with membership drawn from the African Sub-regional Metrology Organizations ("SRMO").

The main mandate of AFRIMETS is to promote the development of scientific, industrial and legal metrology issues across Africa and to operate as a fully-fledged Regional Metrology Organization (RMO), in accordance with the Mutual Recognition Arrangement (MRA) of the International Committee for Weights and Measures (CIPM). The membership of AFRIMETS is per country. Each country is represented by the national metrology institute responsible for Scientific & Industrial metrology and the organization responsible for Weights and Measures (or Le-

gal Metrology Bodies, LMBs) and thus has two votes. Member countries that are signatories to a SRMO are called Principal members and member countries not part of a SRMO, Ordinary members. NMIs and LMBs outside Africa can become Associate members. Other organisations with an interest in AFRIMETS can become Observers.

In addition to the goal to develop accurate, internationally accepted measurement capabilities, a main focus of the 45 member country institutions is to provide measurement and testing capabilities needed for a continental free trade area (CFTA).

To keep track of the development of Scientific & Industrial metrology and Weights & Measures (or Legal metrology), a set of classifications were developed to classify the maturity of development and to provide a clear picture of the status of both categories of metrology in a country.

CATEGORY	CRITERIA
1 NMIs participating in the CIPM MRA	<ul style="list-style-type: none"> • Official institutes responsible for scientific & industrial metrology • Member State of International Bureau of Weights and Measures (BIPM) • Capabilities in most areas of metrology, or those critical for the country • At least some in-house realization of the International System of Units (SI) • International traceability in place for all national standards • AFRIMETS (or EURAMET)-approved quality system in place • Most laboratories accredited or peer reviewed • Calibration and Measurement Capabilities (CMC) entries in Key Comparison Data Base (KCDB), or imminent
2 NMIs participating in RMO activities	<ul style="list-style-type: none"> • Official institutes responsible for scientific & industrial metrology • Associate of General Conference on Weights and Measures (CGPM) • Capabilities in most areas of metrology, or those critical for the country • International traceability in place for all or critical national standards • AFRIMETS (or EURAMET)-approved quality system in place, or imminent • Most laboratories accredited or peer reviewed
3 NMIs providing national traceability	<ul style="list-style-type: none"> • Official institutes responsible for scientific & industrial metrology • Associate of CGPM, or plans to become one in next 5 years • Capabilities in basic areas of metrology, or those critical for the country • Traceability in place for critical national standards • Quality system in place • Critical laboratories accredited or peer reviewed
4 Basic scientific metrology infrastructure	<ul style="list-style-type: none"> • Official institutes responsible for scientific & industrial metrology • Capabilities in basic areas of metrology, or those critical for the country • Traceability in place for some parameters • Quality system in place or being developed
5 Limited or no scientific metrology infrastructure	<ul style="list-style-type: none"> • No official institute responsible for scientific & industrial metrology • Very basic facilities in a government department or related institute

Table 4: Classification criteria for scientific & industrial metrology (2017)

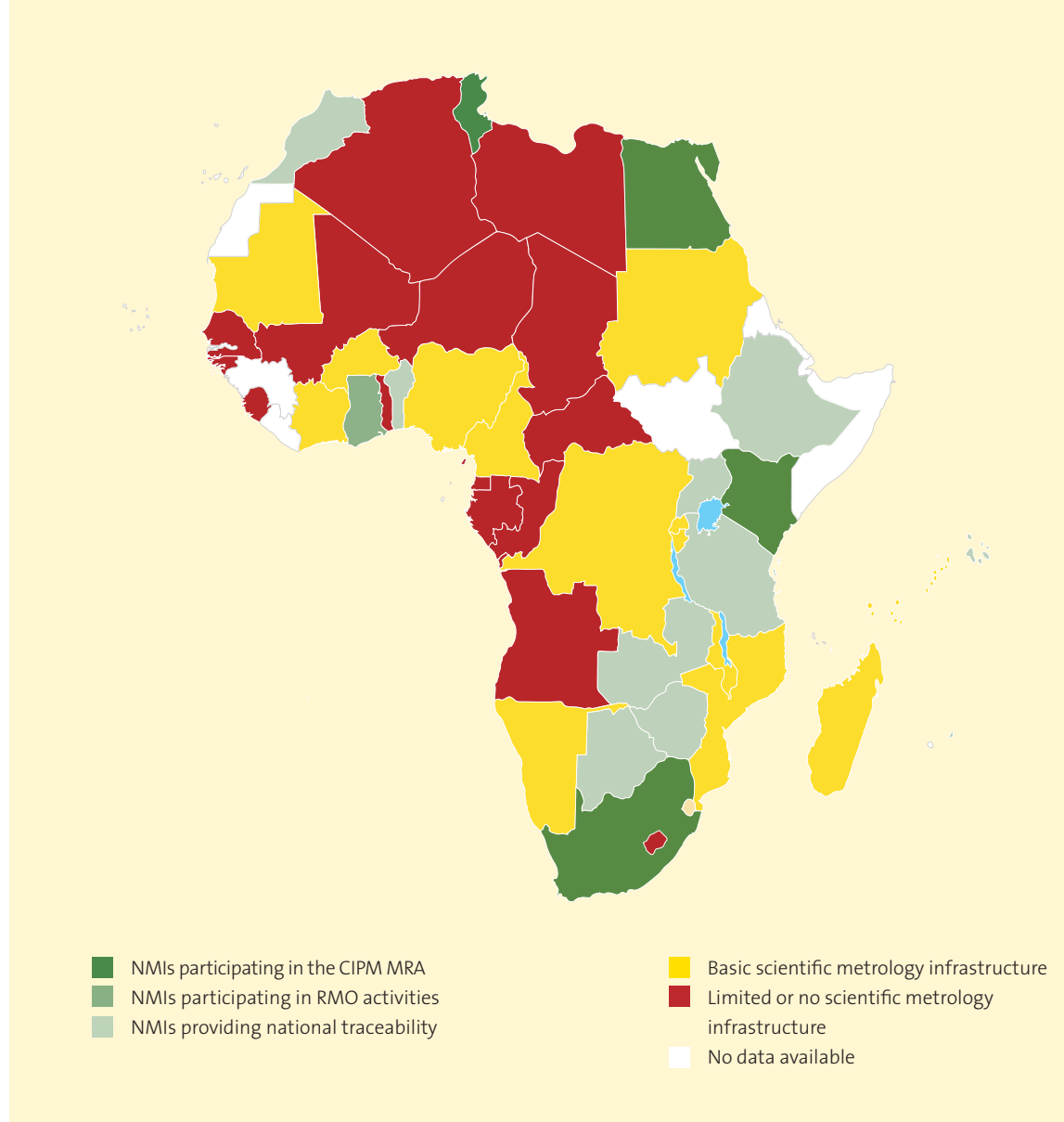


Figure 2: AFRIMETS stocktaking (scientific & industrial metrology)

CATEGORY	COUNTRY
1	Egypt, Kenya, South Africa and Tunisia
2	Ghana
3	Benin, Botswana, Ethiopia, Mauritius, Morocco, Seychelles, Tanzania, Uganda, Zambia and Zimbabwe
4	Burkina Faso, Burundi, Cameroon, Côte d'Ivoire, DRC, Madagascar, Malawi, Mauritania, Mozambique, Namibia, Nigeria, Rwanda, Sudan and Swaziland
5	Algeria, Angola, CAR, Chad, Equatorial Guinea, Gabon, Guinea-Bissau, Lesotho, Libya, Mali, Niger, Republic of the Congo, Senegal, Sierra Leone and Togo

Table 5: Classification of capabilities in scientific & industrial metrology

AFRIMETS Scientific & Industrial Metrology comparison 2014/2017

NO	COUNTRY	AFRIMETS scientific & industrial 2014	AFRIMETS scientific & industrial 2017
1	ALGERIA		
2	ANGOLA		
3	BENIN		
4	BOTSWANA		
5	BURKINA FASO		
6	BURUNDI		
7	CAMEROON		
8	CAPO VERDE		
9	CENTRAL REPUBLIC OF AFRICA		
10	CHAD		
11	COMOROS		
12	CONGO BRAZAVILLE		
13	COTE D'IVOIRE		
14	DEMOCRATIC REPUBLIC OF CONGO		
15	DJIBOUTI		
16	EGYPT		
17	ERITREA		
18	ETHIOPIA		
19	EQUATORIAL GUINEA		
20	GABON		
21	GAMBIA		
22	GHANA		
23	GUINEA		
24	GUINEA BISSAU		
25	KENYA		
26	LESOTHO		
27	LIBERIA		
28	LIBYA		

NO	COUNTRY	AFRIMETS scientific & industrial 2014	AFRIMETS scientific & industrial 2017
29	MADAGASCAR		
30	MALAWI		
31	MALI		
32	MAURITANIA		
33	MAURITIUS		
34	MOROCCO		
35	MOZAMBIQUE		
36	NAMIBIA		
37	NIGER		
38	NIGERIA		
39	RWANDA		
40	SAO TOME AND PRINCIPE		
41	SENEGAL		
42	SEYCHELLES		
43	SIERRA LEONE		
44	SOMALIA		
45	SOUTH AFRICA		
46	SOUTH SUDAN		
47	SUDAN		
48	SWAZILAND		
49	TANZANIA		
50	TOGO		
51	TUNISIA		
52	UGANDA		
53	WESTERN SAHARA		
54	ZAMBIA		
55	ZIMBABWE		

Table 6: AFRIMETS scientific & industrial metrology comparison – 2014/2017

CATEGORY	CRITERIA
1 Recognized legal metrology system at national, regional and international levels	<ul style="list-style-type: none"> • Official institute responsible for legal metrology • Member State of the International Organization of Legal Metrology (OIML) • OIML Mutual Acceptance Arrangement (MAA) signatory • Trade metrology Act (including or with plans to include health, safety, environment and trade) • Facilities to carry out technical activities • Competent staff • Pre-packages • Participation in OIML technical committees • Categories of measuring instruments that fully support the scope of the Legal Metrology Act • Approved quality system in place, accreditation or certification
2 Imbedded LM system with regional and international participation	<ul style="list-style-type: none"> • Official institute responsible for legal metrology • Member State of the OIML • Legal system in place for weights and measures and plans for Legal Metrology Act to include health, safety, environment and trade • Facilities to carry out technical activities • Competent staff • Pre-packages • Participation in OIML technical committees • Categories of measuring instruments that fully support the scope of the Trade Metrology Act. • Approved quality system in place, accreditation or certification
3 Organized LM system with SRMO participation	<ul style="list-style-type: none"> • Official institute responsible for legal metrology • Corresponding Member of OIML • Legal system in place for weights and measures • Facilities to carry out technical activities • Competent staff • Pre-packages • Categories that fully support the scope of the Trade Metrology Act • Participation in SRMO technical activities
4 LM existence at National level with limited resources	<ul style="list-style-type: none"> • Legal system in place, with at least fit-for-purpose regulations for main national issues • Some facilities to carry out technical activities • Trained staff to support technical activities • REC participation • Technical instructions
5 No official LM	<ul style="list-style-type: none"> • No facility and/or act/regulations

Table 7: Classification criteria legal metrology (2017)

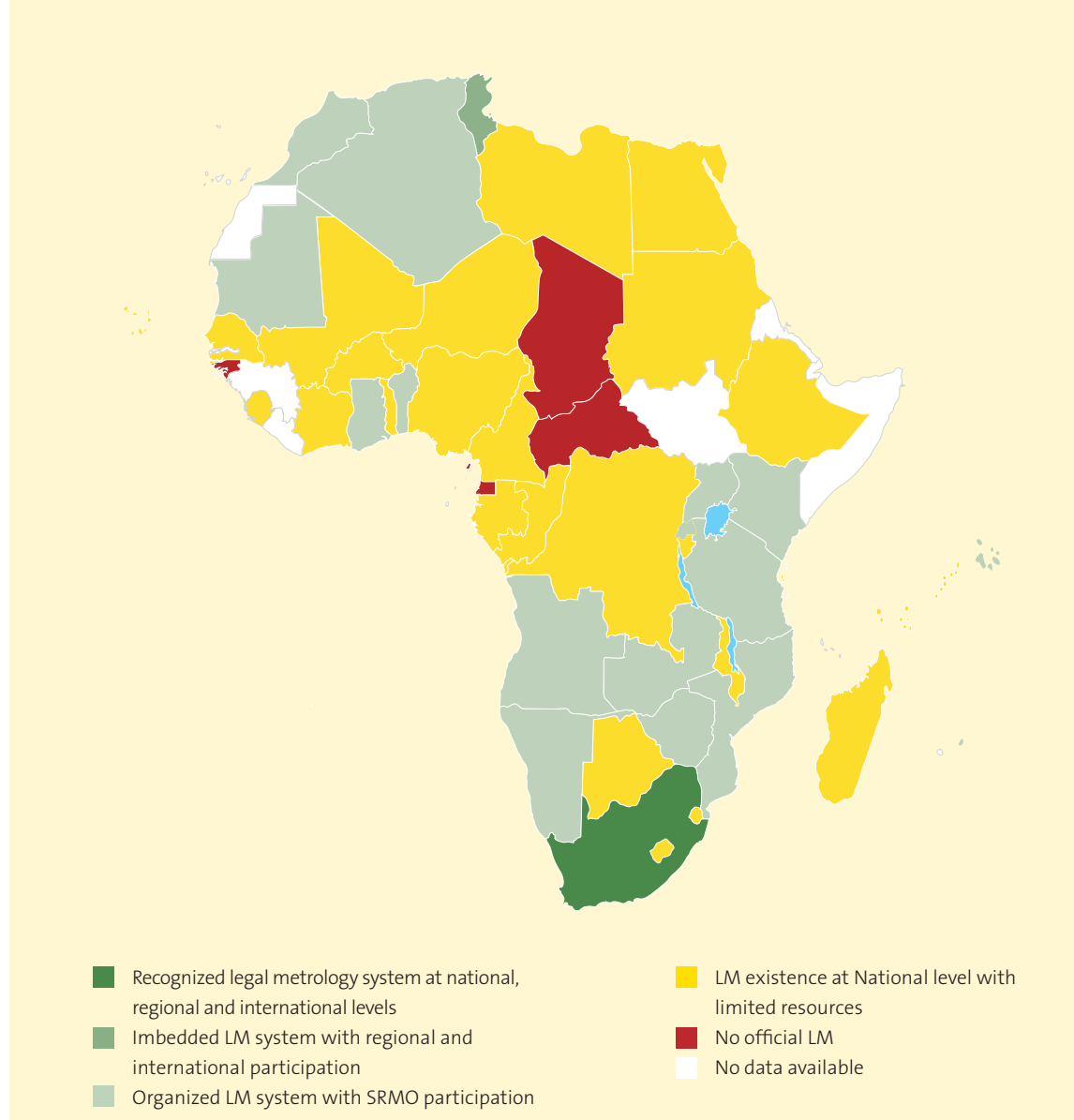


Figure 3: AFRIMETS stocktaking (legal metrology)

The discipline of legal metrology is widely practiced across the African continent. However, 20% of these countries are still “white spots” in that no reliable data is available as yet. For the countries where data exists, a significant move and commitment towards a higher degree of organized legal metrology is noted. Participation in SRMO is also improving. Nevertheless, these promising developments do little to hide the fact that great efforts are still required to cope with alignment to international requirements and increasing consumer protection.

CATEGORY	COUNTRY
1	South Africa
2	Tunisia
3	Algeria, Angola, Benin, Ghana, Kenya, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Rwanda, Seychelles, Tanzania, Uganda, Zambia, Zimbabwe
4	Botswana, Burkina Faso, Burundi, Cameroon, Congo Republic, Côte d'Ivoire, DRC, Egypt, Ethiopia, Gabon, Lesotho, Libya, Madagascar, Malawi, Mali, Niger, Nigeria, Senegal, Sierra Leone, Sudan, Swaziland, Togo
5	Central Republic of Africa, Chad, Equatorial-Guinea, Guinea-Bissau

Table 8: Classification of capabilities in legal metrology

AFRIMETS Legal Metrology comparison 2014/2017

NO	COUNTRY	AFRIMETS legal 2014	AFRIMETS legal 2017
1	ALGERIA		
2	ANGOLA		
3	BENIN		
4	BOTSWANA		
5	BURKINA FASO		
6	BURUNDI		
7	CAMEROON		
8	CAPO VERDE		
9	CENTRAL REPUBLIC OF AFRICA		
10	CHAD		
11	COMOROS		
12	CONGO BRAZAVILLE		
13	COTE D'IVOIRE		
14	DEMOCRATIC REPUBLIC OF CONGO		
15	DJIBOUTI		
16	EGYPT		
17	ERITREA		
18	ETHIOPIA		
19	EQUATORIAL GUINEA		
20	GABON		
21	GAMBIA		
22	GHANA		
23	GUINEA		
24	GUINEA BISSAU		
25	KENYA		
26	LESOTHO		
27	LIBERIA		
28	LIBYA		

NO	COUNTRY	AFRIMETS legal 2014	AFRIMETS legal 2017
29	MADAGASCAR		
30	MALAWI		
31	MALI		
32	MAURITANIA		
33	MAURITIUS		
34	MOROCCO		
35	MOZAMBIQUE		
36	NAMIBIA		
37	NIGER		
38	NIGERIA		
39	RWANDA		
40	SAO TOME AND PRINCIPE		
41	SENEGAL		
42	SEYCHELLES		
43	SIERRA LEONE		
44	SOMALIA		
45	SOUTH AFRICA		
46	SOUTH SUDAN		
47	SUDAN		
48	SWAZILAND		
49	TANZANIA		
50	TOGO		
51	TUNISIA		
52	UGANDA		
53	WESTERN SAHARA		
54	ZAMBIA		
55	ZIMBABWE		

Table 9: AFRIMETS legal metrology comparison – 2014/2017



1.3 African Electrotechnical Standardization Commission (AFSEC)

The African Electrotechnical Standardization Commission (AFSEC) was established in February 2008, having legal status in accordance with Article 24 of the Convention of the African Energy Commission, through declarations of the Conferences of African Ministers of Energy. AFSEC's mission is in the fields of standards and conformity assessment systems for electricity, electronics and related technologies. With the prime aim of improving access to electricity for African populations, it is responsible for:

- Identification of existing standards and prioritization of the needs for standards in Africa
- Harmonizing existing standards either through the adoption of international standards or where necessary their adaptation to African conditions
- Promoting appropriate conformity assessment systems to assess and improve the quality of electrical products and services

AFSEC is recognized by the International Electrotechnical Commission (IEC) through a cooperation agreement signed in 2009. It has formal cooperation agreements with the European Committee for Electrotechnical Standardization (CENELEC) and cooperation agreements within the field of electrotechnical standardization with several national standards bodies.

AFSEC members are National Electrotechnical Committees (NECs), one per African member state. Affiliate members are drawn from African Power Pools, and other regional and continental structures.

Since 2014, the principle changes to AFSEC membership have been the addition of Tunisia, while Libya has ceased all activity. There have been encouraging signs of growing interest with 6 more countries now having established their NECs and 2 more having joined the IEC affiliate country programme.

CATEGORY	CRITERIA
1 NECs participating in both regional and international standardisation	<ul style="list-style-type: none"> • Establishment of National Electrotechnical Committee • Member of AFSEC • Member of IEC • Participation in AFSEC Technical /Sub committees • Participation in IEC Technical / Sub committees • Technical Committee Chair/Secretariat AFSEC • Technical Committee Chair/Secretariat IEC
2 NECs participation in regional standardisation and limited international standardisation	<ul style="list-style-type: none"> • Establishment of National Electrotechnical Committee • Member of AFSEC • Affiliate Member of IEC • Participation in AFSEC Technical /Sub committees • Participation in IEC Technical / Sub committees • Technical Committee Chair/Secretariat AFSEC
3 NECs not members of AFSEC but participating in limited standardisation	<ul style="list-style-type: none"> • Establishment of National Electrotechnical Committee • Not a member of AFSEC • Affiliate /Member of IEC • Participation in IEC Technical work
4 No establishment of NECs or the NECs are not active members of IEC or Affiliate	<ul style="list-style-type: none"> • No National Electrotechnical Committee • Member of IEC/Affiliate member • Passive member of IEC
5 No establishment of NECs - No activity	<ul style="list-style-type: none"> • No Establishment of NEC • Not a member of AFSEC or IEC

Table 10: Classification criteria for electrotechnical standardisation (2017)

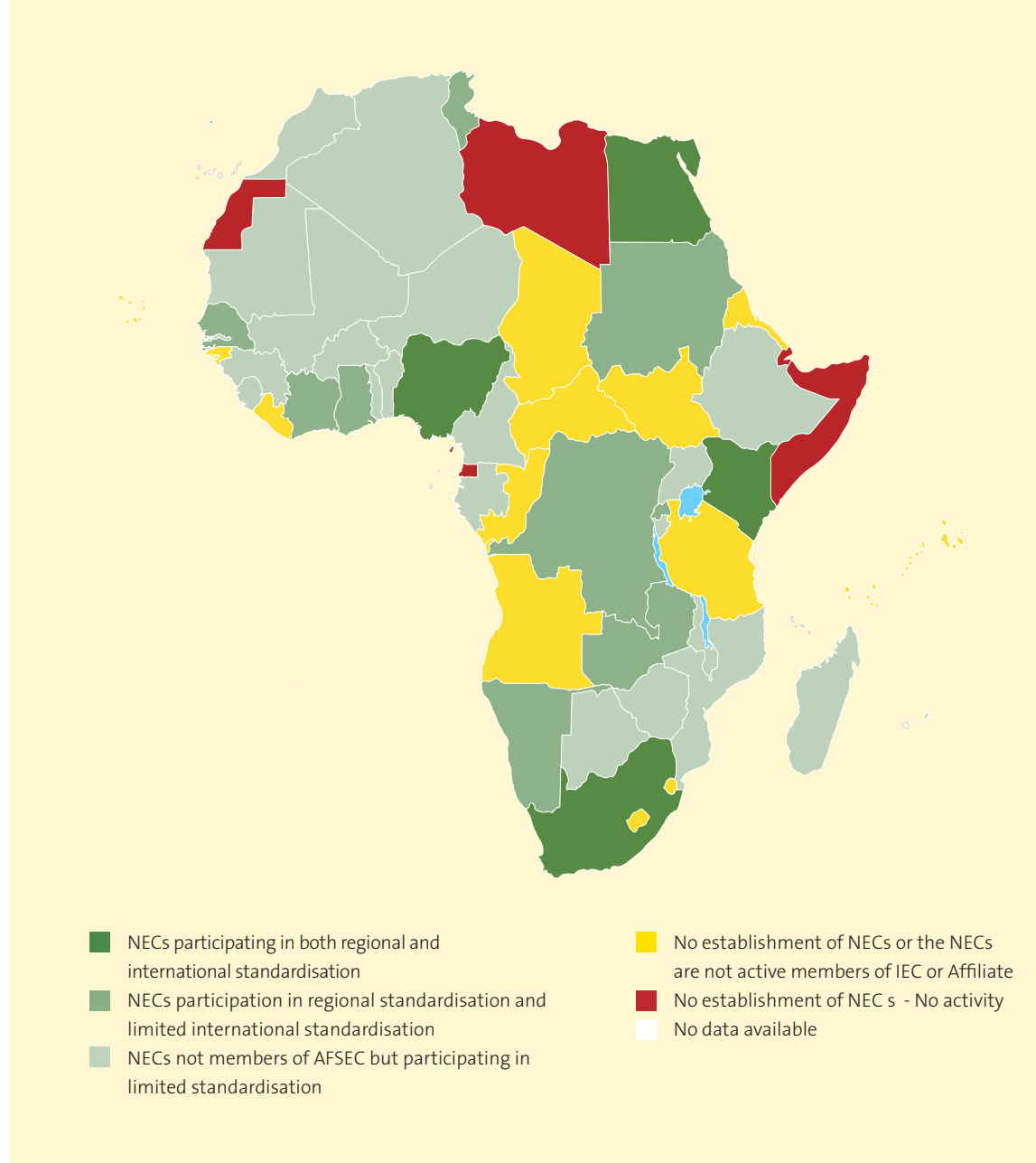


Figure 4: AFSEC stocktaking

CATEGORY	COUNTRY
1	Egypt, Kenya, Nigeria and South Africa
2	Cote d'Ivoire, DR Congo, Ghana, Namibia, Rwanda, Senegal, Sudan, Tunisia and Zambia
3	Algeria, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Ethiopia, Gabon, Gambia, Guinea, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Niger, Sierra Leone, Tanzania, Togo, Uganda and Zimbabwe
4	Angola, Capo Verde, Central African Republic, Chad, Congo Brazzaville, Eritrea, Guinea Bissau, Lesotho, Liberia, Seychelles, South Sudan and Swaziland,
5	Djibouti, Equatorial Guinea, Libya, Sao Tome & Principe, Somalia and Western Sahara

Table 11: Classification of capabilities in electrotechnical standardisation

AFSEC comparison 2014/2017

NO	COUNTRY	AFSEC 2014	AFSEC 2017
1	ALGERIA		
2	ANGOLA		
3	BENIN		
4	BOTSWANA		
5	BURKINA FASO		
6	BURUNDI		
7	CAMEROON		
8	CAPO VERDE		
9	CENTRAL REPUBLIC OF AFRICA		
10	CHAD		
11	COMOROS		
12	CONGO BRAZAVILLE		
13	COTE D'IVOIRE		
14	DEMOCRATIC REPUBLIC OF CONGO		
15	DJIBOUTI		
16	EGYPT		
17	ERITREA		
18	ETHIOPIA		
19	EQUATORIAL GUINEA		
20	GABON		
21	GAMBIA		
22	GHANA		
23	GUINEA		
24	GUINEA BISSAU		
25	KENYA		
26	LESOTHO		
27	LIBERIA		
28	LIBYA		

NO	COUNTRY	AFSEC 2014	AFSEC 2017
29	MADAGASCAR		
30	MALAWI		
31	MALI		
32	MAURITANIA		
33	MAURITIUS		
34	MOROCCO		
35	MOZAMBIQUE		
36	NAMIBIA		
37	NIGER		
38	NIGERIA		
39	RWANDA		
40	SAO TOME AND PRINCIPE		
41	SENEGAL		
42	SEYCHELLES		
43	SIERRA LEONE		
44	SOMALIA		
45	SOUTH AFRICA		
46	SOUTH SUDAN		
47	SUDAN		
48	SWAZILAND		
49	TANZANIA		
50	TOGO		
51	TUNISIA		
52	UGANDA		
53	WESTERN SAHARA		
54	ZAMBIA		
55	ZIMBABWE		

Table 12: AFSEC electrotechnical standardisation comparison – 2014/2017



1.4 African Organization for Standardisation (ARSO)

As an African Union Commission arm for standardization, African Organization for Standardisation (ARSO) has been working and operating in the field of standards harmonization and development of conformity assessment tools and extension systems for the implementation of these standards since its formation in 1977. The fundamental aim of the ARSO standards and conformity assessment harmonization work is to facilitate intra-African and international trade of goods and services. To extend its reach, ARSO is an observer member of International Organization for Standardization (ISO), CODEX Alimentarius Commission and World Trade Organisation and has also signed Memoranda of Understanding with various standardization organizations and African Regional Economic Communities (RECS).

The need for better Quality Infrastructure in Africa is in line with the provisions and aspirations of Chapter XI Article 67 of the Abuja Treaty establishing the African Economic Community (the “AEC Treaty”) which forms the basis for Africa-wide quality infrastructure to support African industrialisation, trade and socio-economic development, the subjects of which led to the foundation of ARSO by the Organisation of African Unity (currently AU) and UNECA in 1977.

ARSO members are 36 registered African countries through their National Standards Bodies (NSBs) that have registered pay annual membership fees.

The 9th Ordinary Session of the African Union (AU) Conference of Ministers of Trade in Addis Ababa, Ethiopia, on 4 - 5 December, 2014 directed that all AU Member States that are currently not Members of ARSO should endeavour to attain membership by the year 2017.

CATEGORY	CRITERIA
1 NSBs Participating in Regional and international activities	<ul style="list-style-type: none"> • Official National Standards Body • Member of ARSO • Full Member of ISO • Participation in ARSO Technical /Sub committees • Participation in ISO Technical / Sub committees • Participation in Regional Harmonization of Standards
2 NSBs participating in Regional Activities and limited International	<ul style="list-style-type: none"> • Official National Standards Body • Member of ARSO • Correspondent /subscriber member of ISO • Participation in ARSO Technical /Sub committees • Participation in ISO Technical / Sub committees • Participation in Regional Harmonization of Standards
3 NSBs participating in limited regional activities and international activities but not ARSO members	<ul style="list-style-type: none"> • Official National Standards Body • Member of ISO • Participation in regional harmonization • Participation in ISO Technical work
4 Passive members in both regional and international standardisation	<ul style="list-style-type: none"> • Official National Standards Body • Member of ISO/ARSO
5 No official NSBs	<ul style="list-style-type: none"> • No official National Standards Body

Table 13: Classification criteria for standardisation (2017)

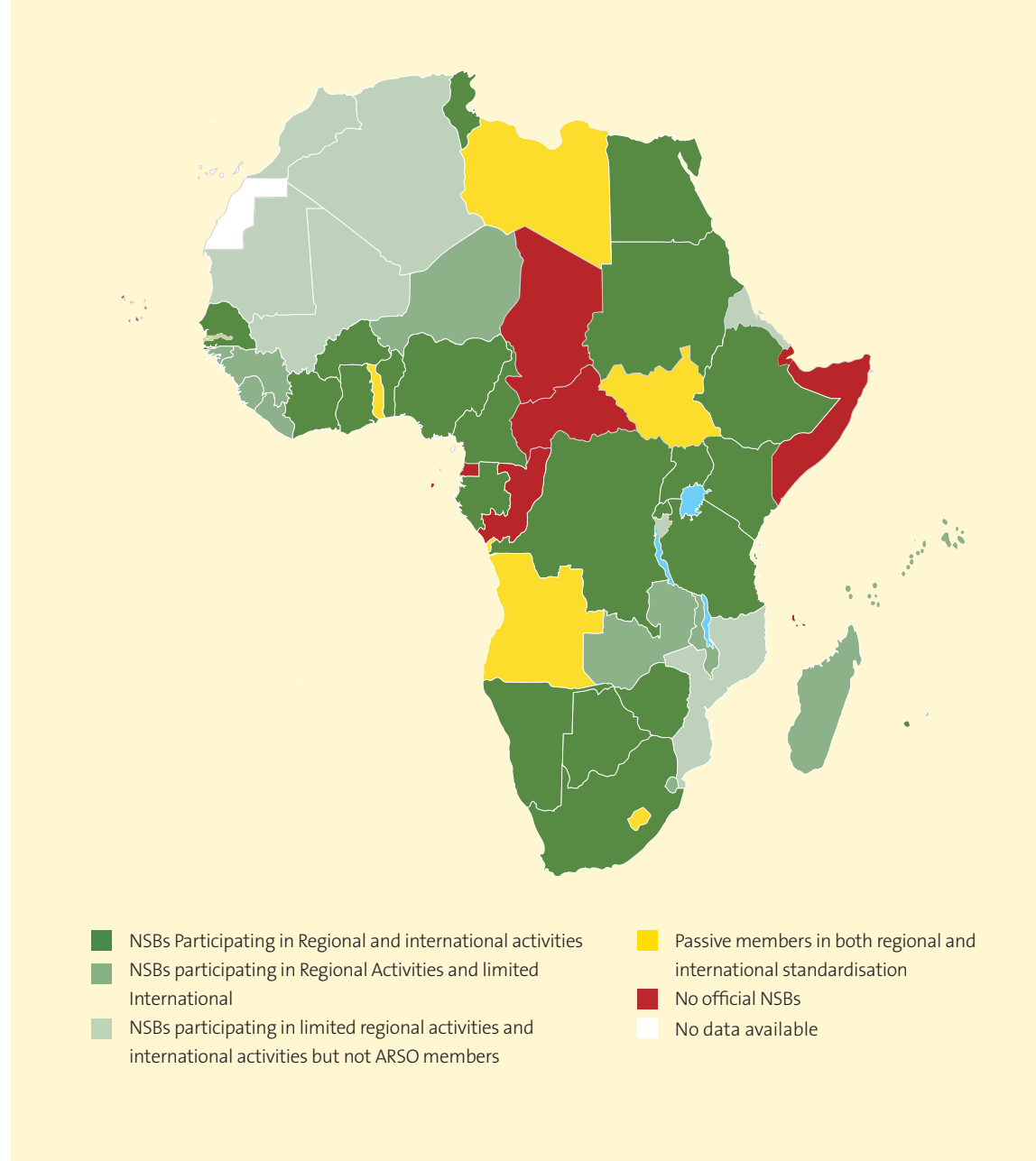


Figure 5: ARSO stocktaking

CATEGORY	COUNTRY
1	Benin, Botswana, Burkina Faso, Cameroon, Cote D'Ivoire, Democratic Republic of the Congo, Egypt, Ethiopia, Gabon, Ghana, Kenya, Mauritius, Namibia, Nigeria, Rwanda, Senegal, South Africa, Sudan, Tanzania, Tunisia, Uganda, Zimbabwe
2	Guinea, Guinea Bissau, Liberia, Madagascar, Malawi, Niger, Seychelles, Sierra Leone, Swaziland, Zambia
3	Algeria, Burundi, Eritrea, Gambia, Mali, Mauritania, Morocco, Mozambique
4	Angola, Lesotho, Libya, South Sudan, Togo,
5	Capo Verde, Central African Republic, Chad, Comoros, Congo Brazzaville, Djibouti, Equatorial Guinea, Sao Tome and Principe, Somalia

Table 14: Classification of capabilities in standardisation

ARSO Comparision 2014/2017

NO	COUNTRY	ARSO 2014	ARSO 2017
1	ALGERIA		
2	ANGOLA		
3	BENIN		
4	BOTSWANA		
5	BURKINA FASO		
6	BURUNDI		
7	CAMEROON		
8	CAPO VERDE		
9	CENTRAL REPUBLIC OF AFRICA		
10	CHAD		
11	COMOROS		
12	CONGO BRAZAVILLE		
13	COTE D'IVOIRE		
14	DEMOCRATIC REPUBLIC OF CONGO		
15	DJIBOUTI		
16	EGYPT		
17	ERITREA		
18	ETHIOPIA		
19	EQUATORIAL GUINEA		
20	GABON		
21	GAMBIA		
22	GHANA		
23	GUINEA		
24	GUINEA BISSAU		
25	KENYA		
26	LESOTHO		
27	LIBERIA		
28	LIBYA		

NO	COUNTRY	ARSO 2014	ARSO 2017
29	MADAGASCAR		
30	MALAWI		
31	MALI		
32	MAURITANIA		
33	MAURITIUS		
34	MOROCCO		
35	MOZAMBIQUE		
36	NAMIBIA		
37	NIGER		
38	NIGERIA		
39	RWANDA		
40	SAO TOME AND PRINCIPE		
41	SENEGAL		
42	SEYCHELLES		
43	SIERRA LEONE		
44	SOMALIA		
45	SOUTH AFRICA		
46	SOUTH SUDAN		
47	SUDAN		
48	SWAZILAND		
49	TANZANIA		
50	TOGO		
51	TUNISIA		
52	UGANDA		
53	WESTERN SAHARA		
54	ZAMBIA		
55	ZIMBABWE		

Table 15: ARSO standardisation comparison – 2014/2017

2. SUMMARY OF THE QUALITY INFRASTRUCTURE IN AFRICA

2.1 Quality Infrastructure classification of African Countries

NO	COUNTRY	AFRAC	AFRIMETS		AFSEC	ARSO	PAQI ranking
			Sc. & Ind. Metrology	Legal Metrology			
1	ALGERIA						1.8
2	ANGOLA						1.6
3	BENIN						2.2
4	BOTSWANA						2.6
5	BURKINA FASO						1.8
6	BURUNDI						1.0
7	CAMEROON						1.6
8	CAPO VERDE						0.2
9	CENTRAL REPUBLIC OF AFRICA						0.2
10	CHAD						0.2
11	COMOROS						
12	CONGO BRAZAVILLE						0.4
13	COTE D'IVOIRE						2.0
14	DEMOCRATIC REPUBLIC OF CONGO						2.6
15	DJIBOUTI						0.0
16	EGYPT						3.4
17	ERITREA						0.6
18	ETHIOPIA						2.4
19	EQUATORIAL GUINEA						0
20	GABON						1.4
21	GAMBIA						1.0
22	GHANA						2.6
23	GUINEA						1.0
24	GUINEA BISSAU						1.0
25	KENYA						3.2
26	LESOTHO						1.4
27	LIBERIA						0.8
28	LIBYA						0.8

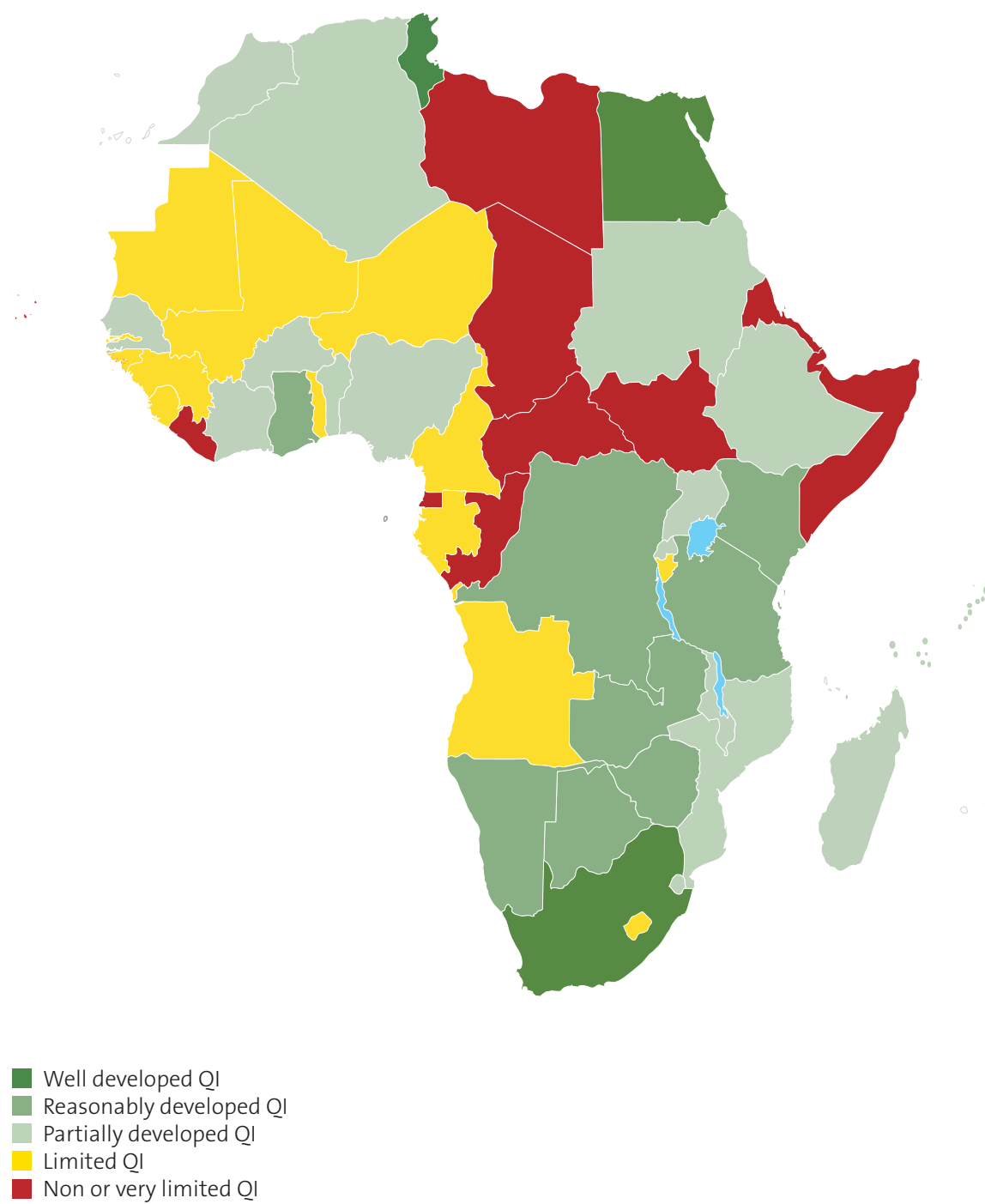
NO	COUNTRY	AFRAC	AFRIMETS		AFSEC	ARSO	PAQI ranking
			Sc. & Ind. Metrology	Legal Metrology			
29	MADAGASCAR						2.2
30	MALAWI						2.2
31	MALI						1.2
32	MAURITANIA						1.6
33	MAURITIUS						2.4
34	MOROCCO						2.0
35	MOZAMBIQUE						2.2
36	NAMIBIA						2.8
37	NIGER						1.4
38	NIGERIA						2.2
39	RWANDA						2.0
40	SAO TOME AND PRINCIPE						
41	SENEGAL						1.8
42	SEYCHELLES						2.4
43	SIERRA LEONE						1.2
44	SOMALIA						0
45	SOUTH AFRICA						4.0
46	SOUTH SUDAN						0.4
47	SUDAN						1.8
48	SWAZILAND						2.0
49	TANZANIA						3.0
50	TOGO						1.0
51	TUNISIA						3.6
52	UGANDA						2.0
53	WESTERN SAHARA						
54	ZAMBIA						2.8
55	ZIMBABWE						2.8

2.2 Criteria for classification

CATEGORY	WEIGHT SCORE	SCORE RANGE	COUNTRIES
	4	3.3-4.0	Egypt, South Africa, Tunisia
	3	2.5-3.2	Botswana, DR Congo, Ghana, Kenya, Namibia, Tanzania, Zambia, Zimbabwe
	2	1.7-2.4	Algeria, Benin, Burkina Faso, Cote d'Ivoire, Ethiopia, Madagascar, Malawi, Mauritius, Morocco, Mozambique, Nigeria, Rwanda, Senegal, Seychelles, Sudan, Swaziland, Uganda,
	1	0.9-1.6	Angola, Burundi, Cameroon, Gabon, Gambia, Guinea, Guinea Bissau, Lesotho, Mali, Mauritania, Niger, Sierra Leone, Togo
	0	0-0.8	Capo Verde, Central African Republic, Chad, Congo Brazzaville, Djibouti, Eritrea, Equatorial Guinea, Liberia, Libya, Somalia, South Sudan
Not categorized	-	-	Comoros, Sao Tome and Principe, Western Sahara

The highest average = 4, the lowest average = 0

2.3 Stocktaking Map of Quality Infrastructure in Africa



2.4 Quality Infrastructure classification of Africa Countries (PAQI Index), Comparison 2014/2017 and Trend

NO	COUNTRY	PAQI Index 2014	PAQI Index 2017	Trend
1	ALGERIA	1.8	1.8	→
2	ANGOLA	1.2	1.6	↑
3	BENIN	1.8	2.2	↑
4	BOTSWANA	2.4	2.6	↑
5	BURKINA FASO	1.6	1.8	↑
6	BURUNDI	1.0	1.0	→
7	CAMEROON	1.6	1.6	→
8	CAPO VERDE	0	0.2	↑
9	CENTRAL REPUBLIC OF AFRICA	0.2	0.2	→
10	CHAD	0.2	0.2	→
11	COMOROS			
12	CONGO BRAZAVILLE	0.4	0.4	→
13	COTE D'IVOIRE	1.8	2.0	↑
14	DEMOCRATIC REPUBLIC OF CONGO	2.4	2.6	↑
15	DJIBOUTI	0.0	0.0	→
16	EGYPT	3.6	3.4	↓
17	ERITREA	0.4	0.6	↑
18	ETHIOPIA	2.4	2.4	→
19	EQUATORIAL GUINEA	0.0	0.0	→
20	GABON	1.4	1.4	→
21	GAMBIA	0.6	1.0	↑
22	GHANA	2.4	2.6	↑
23	GUINEA	1.0	1.0	→
24	GUINEA BISSAU	0.8	1.0	↑
25	KENYA	3.4	3.2	↓
26	LESOTHO	1.2	1.4	↑
27	LIBERIA	0.6	0.8	↑
28	LIBYA	2.2	0.8	↓

NO	COUNTRY	PAQI Index 2014	PAQI Index 2017	Trend
29	MADAGASCAR	1.8	2.2	↑
30	MALAWI	2.0	2.2	↑
31	MALI	0.8	1.2	↑
32	MAURITANIA	0.6	1.6	↑
33	MAURITIUS	2.4	2.4	→
34	MOROCCO	2.2	2.0	↓
35	MOZAMBIQUE	1.6	2.2	↑
36	NAMIBIA	2.4	2.8	↑
37	NIGER	1.2	1.4	↑
38	NIGERIA	2.2	2.2	→
39	RWANDA	1.8	2.0	↑
40	SAO TOME AND PRINCIPE			
41	SENEGAL	1.6	1.8	↑
42	SEYCHELLES	1.8	2.4	↑
43	SIERRA LEONE	1.2	1.2	→
44	SOMALIA	0.0	0.0	→
45	SOUTH AFRICA	3.3	4.0	↑
46	SOUTH SUDAN	0.2	0.4	↑
47	SUDAN	1.6	1.8	↑
48	SWAZILAND	1.8	2.0	↑
49	TANZANIA	2.2	3.0	↑
50	TOGO	1.0	1.0	→
51	TUNISIA	3.4	3.6	↑
52	UGANDA	1.8	2.0	↑
53	WESTERN SAHARA			
54	ZAMBIA	2.2	2.8	↑
55	ZIMBABWE	2.4	2.8	↑

Concerning investments in QI between 2014 - 2017 a positive trend can be assessed for 32 African countries. 16 countries have kept their QI system relatively stable without significant changes. Two countries have a slight downswing. Only Libya is ranked two grades lower than 2014.

Thus, in brief, the general trend is very promising. 58% of the African countries have rec-

ognized the importance and value of a functioning QI system for social and economic development.

However, compared to 2014, only 3 more countries have entered the "green area", which stands for an increase by only 5%. After all, up to now 50% of the African countries cannot rely on a QI-system which is in accordance with international requirements.

2.5 PAQI Index

CLASSIFICATION	2014	2017
Well developed	4	3
Reasonably developed	0	8
Partially developed	21	17
Limited	13	13
Non or very little	15	11
No data	2	3

