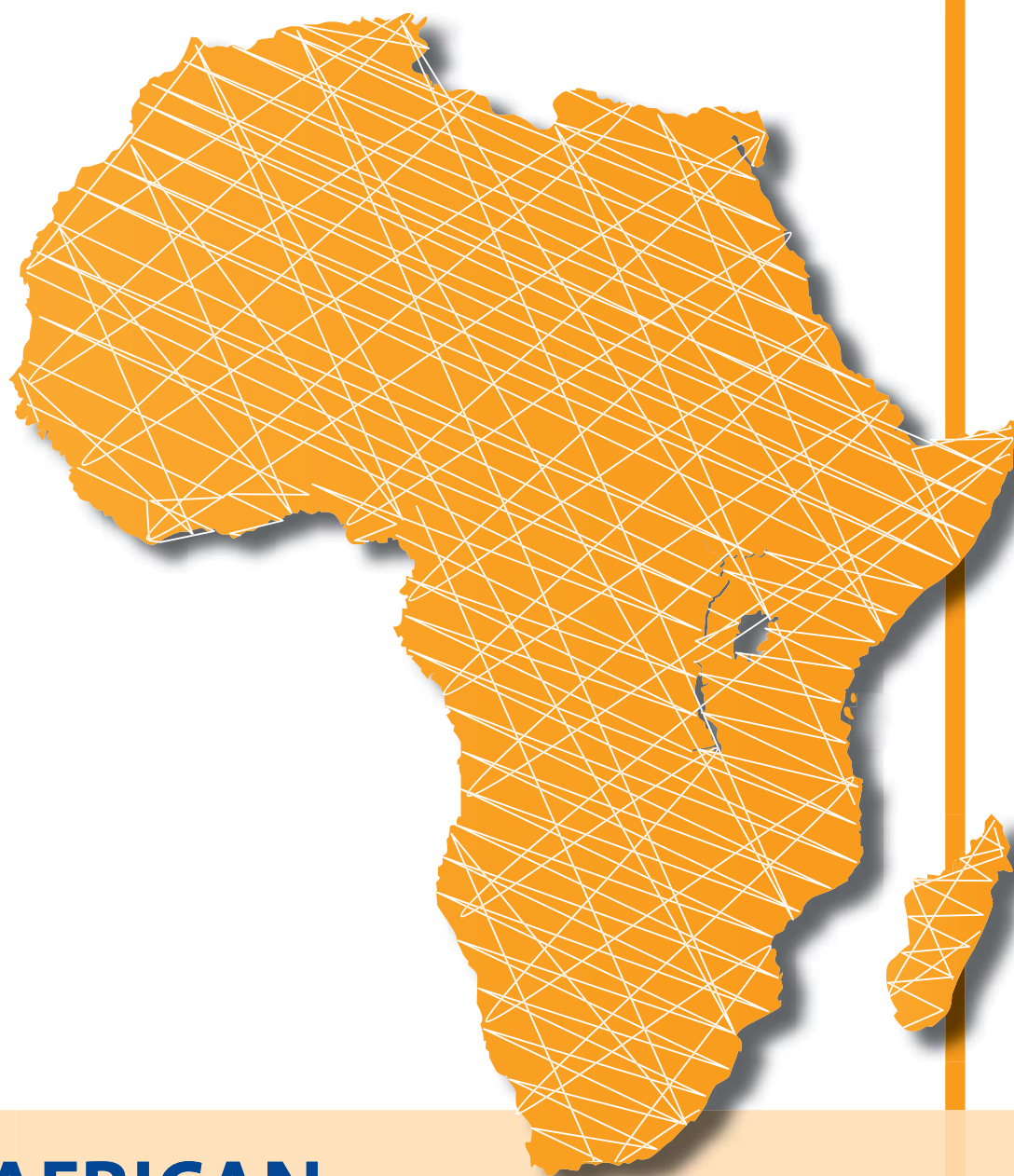


QUALITY FOR AFRICA



PAN-AFRICAN QUALITY INFRASTRUCTURE

Stocktaking Document
– 2014 –

ACKNOWLEDGEMENT

Quality has always been an important issue all over the world. The need of providing quality in all aspects being processes, products and services has become imperative with globalisation. Thus, in order to be competitive there is a need of establishing comprehensive quality infrastructure system at national, regional, continental and international levels. However, you can only fix what you know. A lot of projects have been conducted with aim of fulfilling the gaps in quality infrastructure in Africa since 1970s a period during which standardisation was comprising of all aspects of quality, standards; metrology and measurements, conformity assessment and accreditation. This concept has since then changed; those aspects have been split for better management and avoidance of interferences. Therefore there is a need of knowing the current status of quality infrastructure in Africa for guiding the future development plan and programmes in this area.

Adding to the above, as we strive to strengthen the free trade and competitiveness of Africa's goods and services and contributing towards the industrialisation of the continent, there must be a clear picture of how African countries are committed to the development of effective Quality Infrastructure both at all levels. It is in this respect that the Pan-African Quality Infrastructure (PAQI) being the African platforms on quality matters, through its pillars, African Accreditation Cooperation (AFRAC), Intra-Africa Metrology System (AFRIMETS), African Electrotechnical Standardization Commission (AFSEC) and African Organisation for Standardisation (ARSO) has conducted a stock-taking exercise to establish the status and gaps of accreditation; metrology and measurements and standardisation in Africa.

I am therefore pleased to thank everyone who participated in this activity particularly those from AFRAC, AFRIMETS, AFSEC and ARSO. My special thanks go to Madam Evah Oduor for her advice and support in preparing this document and to PTB for the continuous support to PAQI and printing of the document.

I wish to sincerely appreciate the PAQI pillars for their strong cooperation and commitment towards building Quality Infrastructure in Africa.

Hermogène Nsengimana, PhD

Chairperson, Pan-African Quality Infrastructure (PAQI)

Secretary General, African Organisation for Standardisation (ARSO)

The PAQI initiative is supported by



This document is available at www.paqi.org

CONTENTS

ACKNOWLEDGEMENTS	II
CONTENTS	III
LIST OF ACRONYMS.....	IV
1 Introduction	1
1.1 African Accreditation Cooperation (AFRAC)	2
1.2 Intra-Africa Metrology System (AFRIMETS)	4
1.3 African Electrotechnical Standardization Commission (AFSEC).....	8
1.4 African Organization for Standardisation (ARSO).....	10
2 Summary of the Quality Infrastructure in Africa	12
2.1 Quality Infrastructure classification of African Countries.....	12
2.2 Criteria for classification.....	14
2.3 Stocktaking Map of Quality Infrastructure in Africa	15

LIST OF ACRONYMS

AFRAC	African Accreditation Cooperation
AFRIMETS	Intra-Africa Metrology System
AFSEC	African Electrotechnical Standardization Commission
ARSO	African Organization for Standardisation
AU	African Union
AUC	African Union Commission
BIPM	International Bureau of Weights and Measures
CEMACMET	Organisation de Métrologie de l'Afrique Centrale
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
CGPM	General Conference on Weights and Measures
CIPM	International Committee for Weights and Measures
CMC	Calibration and Measurement Capabilities
DKE	Deutsche Kommission Elektrotechnik Elektronik Informationstechnik, Germany
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
LMOs	Legal Metrology Organisations
MAA	Mutual Acceptance Arrangement
MRA	Mutual Recognition Arrangement
NABs	National Accreditation Bodies
NECs	National Electrotechnical Committees
NMIs	National Metrology Institutes
NSBs	National Standards Bureaus
OAU	Organization of African Unity
OIML	International Organization of Legal Metrology
PAQI	Pan-African Quality Infrastructure
RMO	Regional Metrology Organization
SADC	Southern Africa Development Community
SI	System of Units
SOAMET	Sécretariat Ouest-Africain de Métrologie
SRMO	Sub-regional Metrology Organizations
UNECA	United Nations Economic Commission for Africa

1. INTRODUCTION

The Director of Trade and Industry, African Union Commission (AUC) in Nairobi Kenya, officially launched the Pan-African Quality Infrastructure (PAQI) in August 2013. PAQI is recognized as the continental platform for all matters related to standardisation, metrology and accreditation. Its objective is to enhance Africa's internal trading capacity, increasing its product and service competitiveness globally, and uplifting the welfare of African consumers. This will in turn create a continental quality infrastructure forum to influence future prospects in international trade referencing for Africa's benefit and advantage.

This document provides the status of standardisation, metrology and accreditation in Africa as described by the four pillars of PAQI – AFRAC, AFRIMETS, AFSEC and ARSO.

Each pillar has conceptualized five categories with clearly defined and objectively verifiable indicators. Information thus obtained can not only be clustered and visualized but also be used for monitoring progress over a given timeline.

After categorizing and clustering in the respective field of interest, the Secretariat of the PAQI Joint Committee has summarized all categories again to one PAQI status index, which is shown in 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.

CATEGORY	CRITERIA
1 Fully operational Accreditation Body and IAF and ILAC MRA signatory	<ul style="list-style-type: none"> • Official institute responsible for Accreditation • Signatory of the ILAC and IAF Mutual recognition arrangements • Signatory of the AFRAC Mutual recognition arrangement • Arrangement member of AFRAC
2 Fully operational Accreditation Body; Associate member of ILAC and IAF	<ul style="list-style-type: none"> • Official institute responsible for Accreditation • Not a signatory of the ILAC and IAF Mutual recognition arrangement • Associate member of ILAC and IAF • Not signatories of the AFRAC Mutual recognition arrangement • Full member of AFRAC
3 Fully operational Accreditation Body; Affiliate member of ILAC and IAF	<ul style="list-style-type: none"> • Official institute responsible for Accreditation • Not a signatory of the ILAC and IAF Mutual recognition arrangement • Affiliate member of ILAC and IAF
4 In the process of establishing Accreditation Bodies	<ul style="list-style-type: none"> • In the process of establishing Accreditation Bodies • Affiliate member of AFRAC
5 No official institute responsible for accreditation	<ul style="list-style-type: none"> • No official institute responsible for accreditation

Table 1: Classification criteria for accreditation

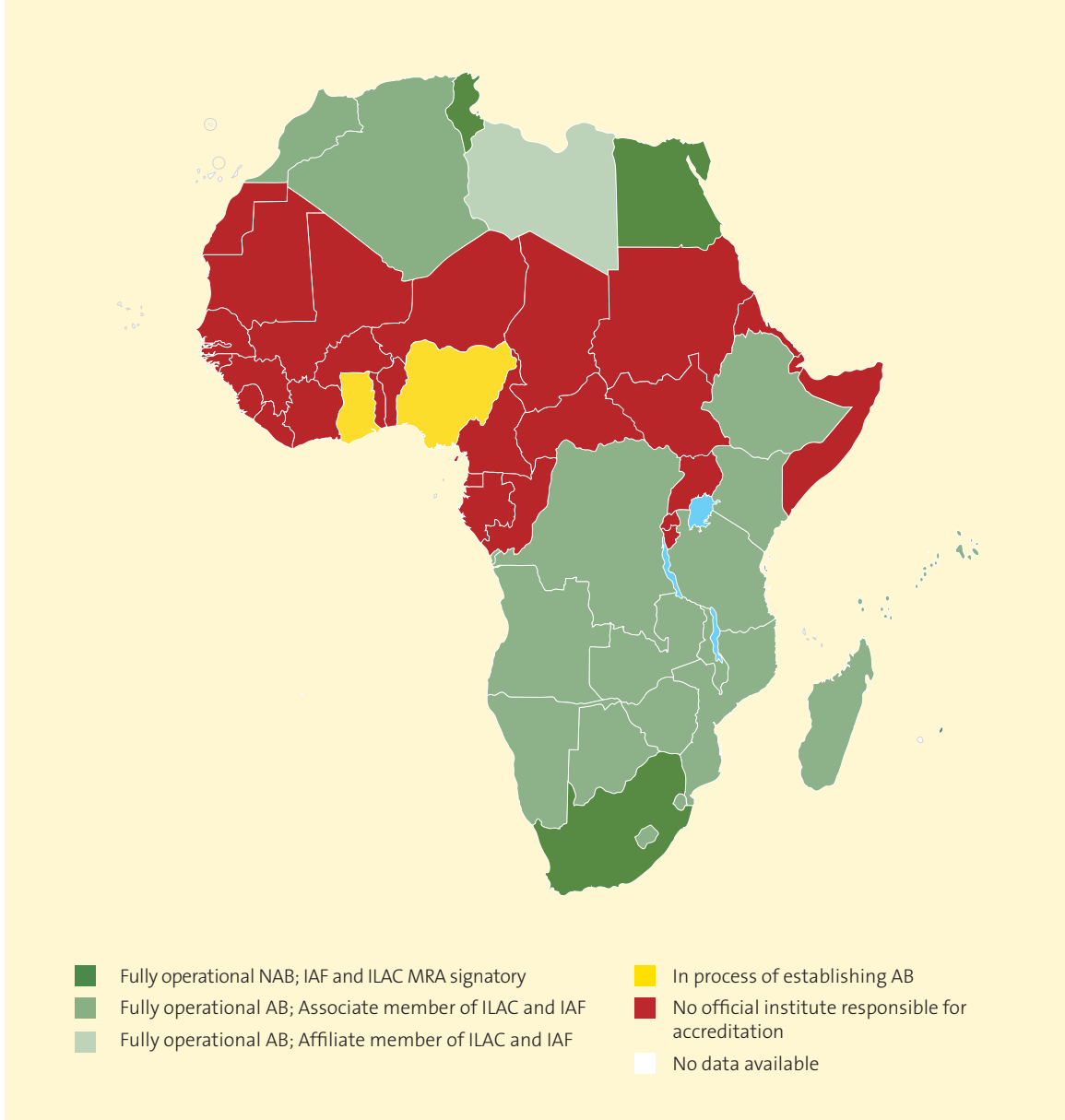


Figure 1: AFRAC stocktaking

CATEGORY	COUNTRY
1	Egypt, Tunisia and South Africa
2	Algeria, Angola, Botswana, DR Congo, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Morocco, Mozambique, Namibia, Seychelles, Swaziland, Tanzania, Zambia and Zimbabwe
3	Libya
4	Ghana and Nigeria
5	Countries not mentioned above

Table 2: Classification of capabilities in accreditation

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 organisation responsible for Weights and Measures (or Legal 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.

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 3: Classification criteria for scientific & industrial metrology

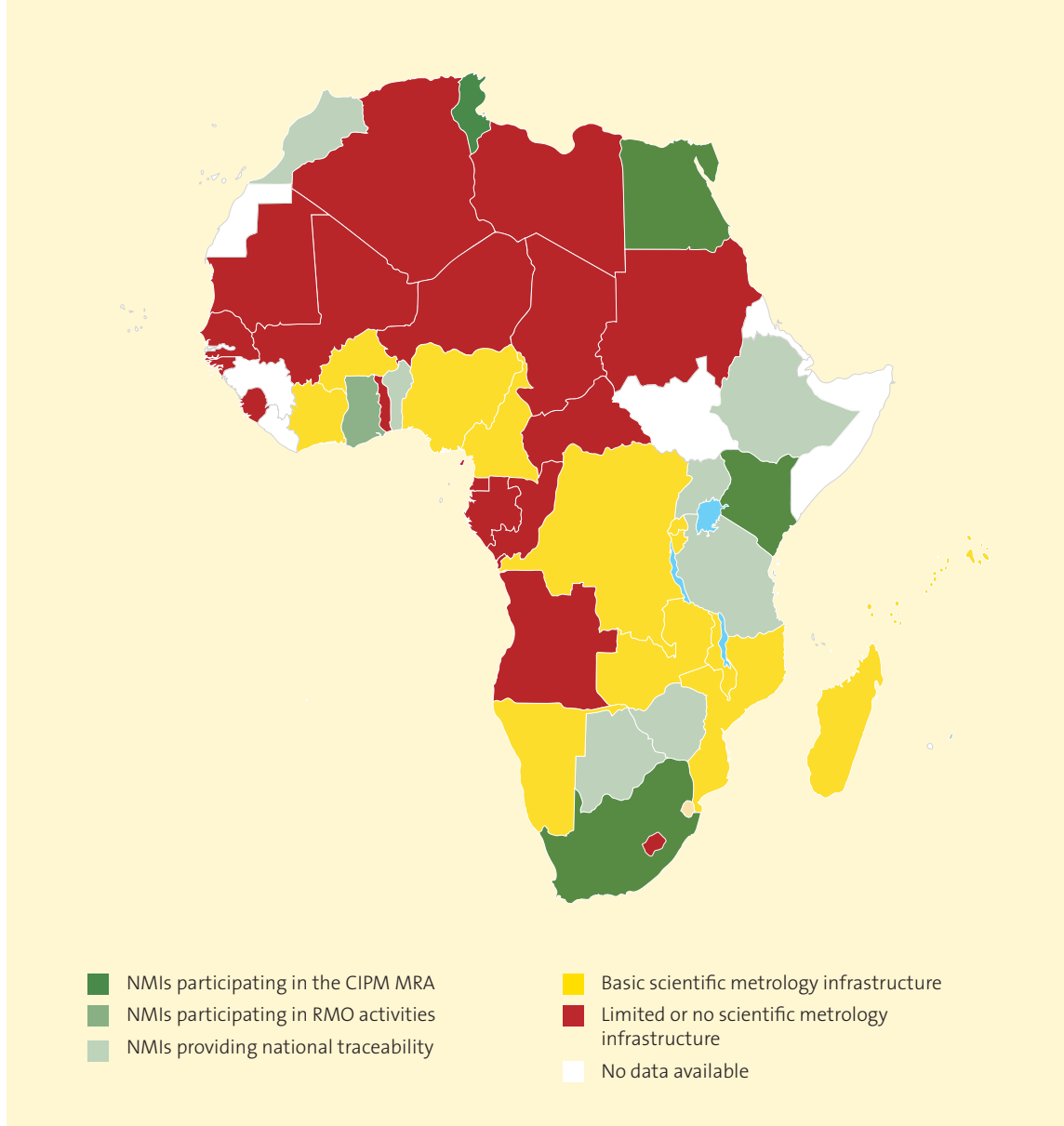


Figure 2: AFRIMETS stocktaking (scientific & industrial metrology)

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

Table 4: Classification of capabilities in scientific & industrial metrology

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 • Legal 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 Legal 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 Legal 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 5: Classification criteria for legal metrology

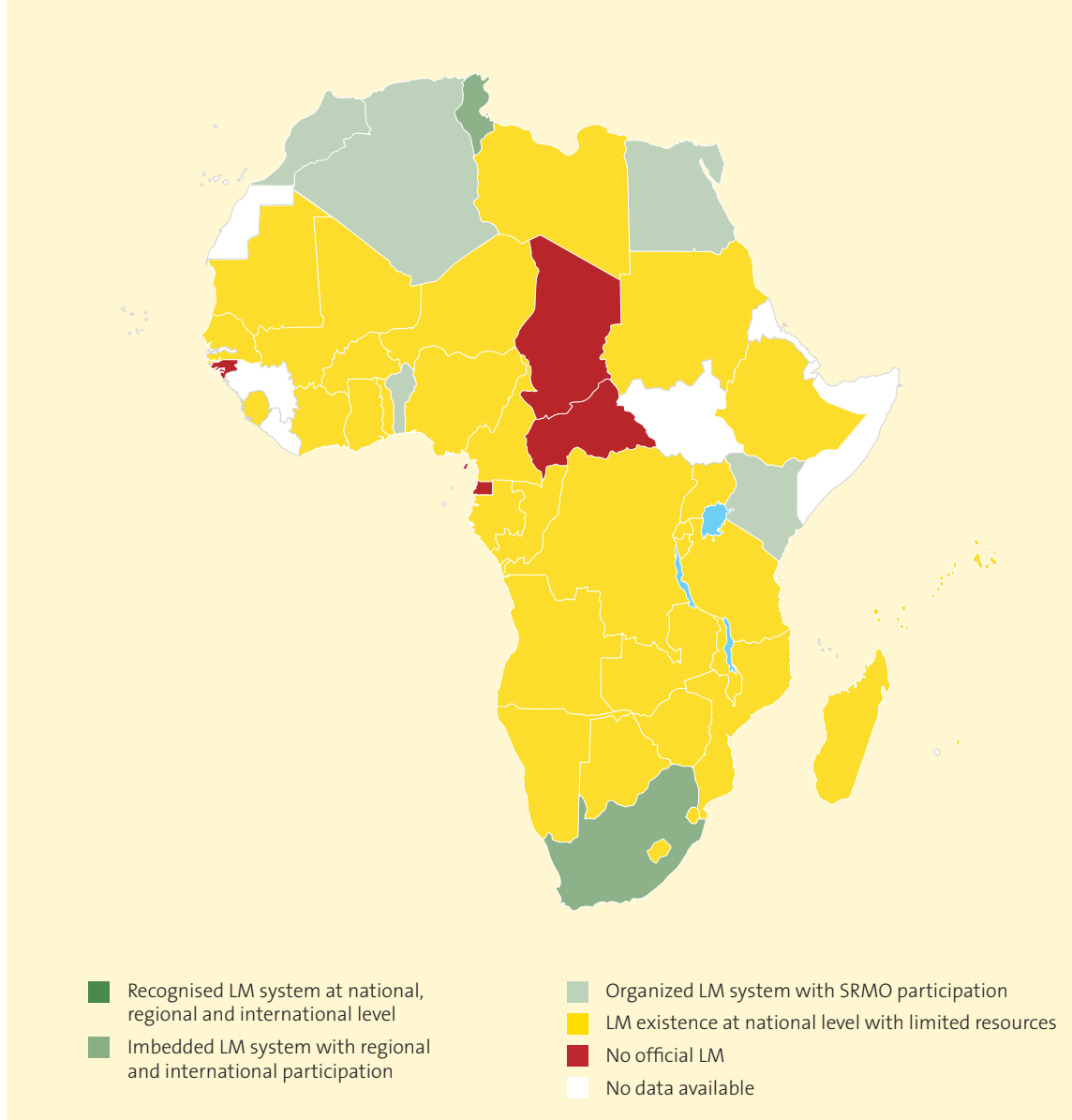


Figure 3: AFRIMETS stocktaking (legal metrology)

Figure 3 shows that although a large part of the continent is covered for legal metrology, the level of the infrastructure is a concern, as well as the lack of infrastructure in the Organisation de Métrologie de l’Afrique Centrale CEMACMET and parts of the Secrétariat Ouest-Africain de Métrologie SOAMET. Many countries classified as “yellow” only perform 10-20% of the required activities.

CATEGORY	COUNTRY
1	None
2	South Africa, Tunisia
3	Algeria, Benin, Egypt, Kenya, Morocco
4	Angola, Botswana, Burkina Faso, Burundi, Cameroon, Côte d’Ivoire, DRC, Ethiopia, Gabon, Ghana, Lesotho, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Republic of the Congo, Rwanda, Senegal, Seychelles, Swaziland, Sudan, Uganda, Tanzania, Togo, Zimbabwe, Zambia, Sierra Leone
5	CAR, Chad, Equatorial-Guinea, Guinea-Bissau

Table 6: Classification of capabilities in legal metrology



1.3 African Electrotechnical Standardization Commission (AFSEC)

The African Electrotechnical Standardization Commission (AFSEC) was established in February 2008 as an organized association. It has legal status in accordance with Article 24 of the Convention of the African Energy Commission, through declarations of Conferences of the Africa Ministers of Energy.

AFSEC mission is in the field of standards for electricity, electronics and related technologies. It is responsible for:

- Identification of existing standards and prioritization of standard's needs
- Harmonizing existing standards either through the adoption of international standards or where necessary their adaptation to African conditions

AFSEC is recognized by the International Electrotechnical Commission (IEC) through a cooperation agreement signed in 2009. It also signed cooperation agreements with the European Committee for Standardization (CEN) and the European Committee for Electrotechnical Standardization (CENELEC) in 2010 and the Deutsche Kommission Elektrotechnik Elektronik Informationstechnik (DKE) Germany in 2011.

AFSEC membership consists of National Electrotechnical Committees (NECs) from each African member state and Affiliate members drawn from the African Power Pools and other AU structures.

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 7: Classification criteria for electrotechnical standardisation

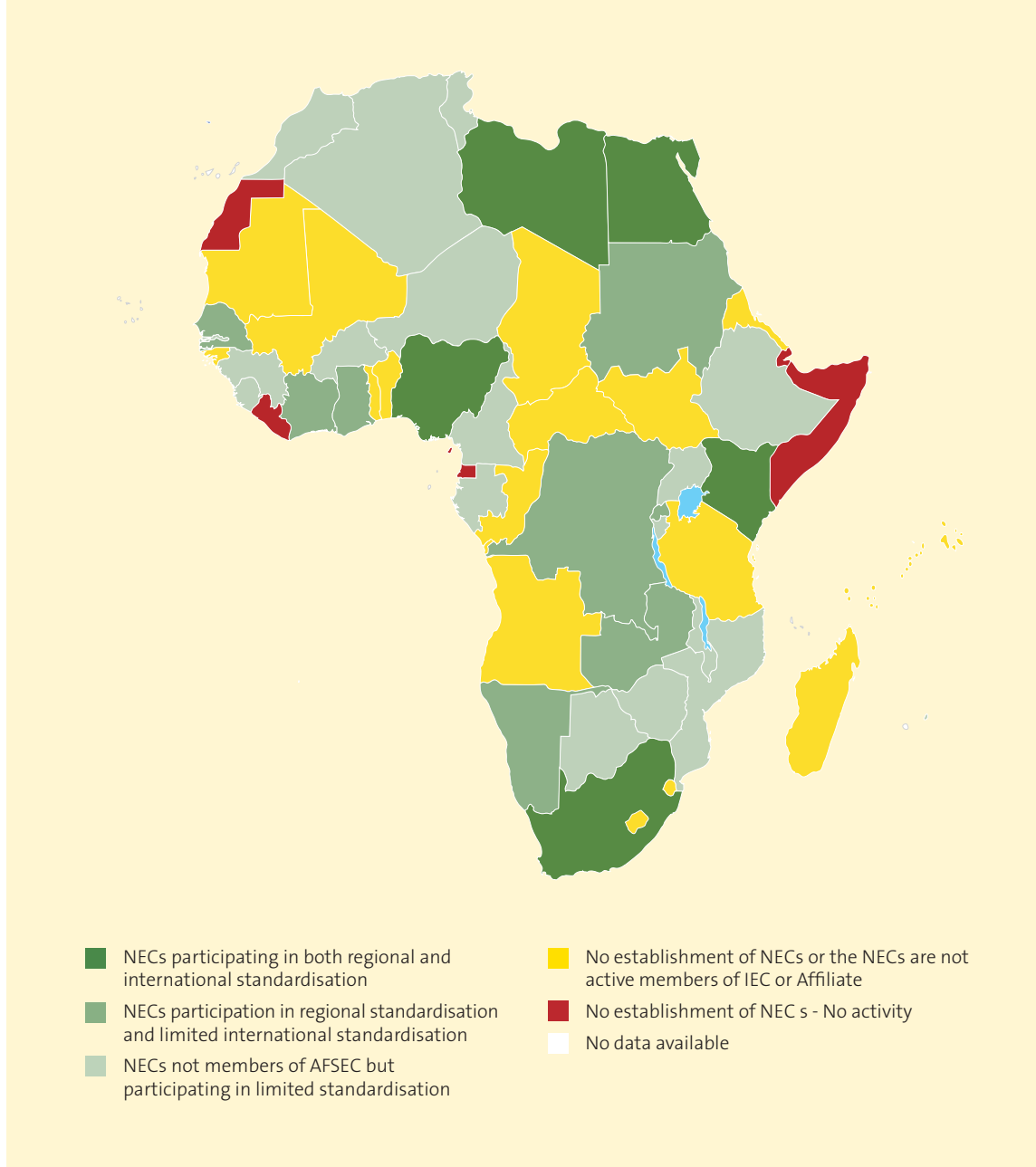


Figure 4: AFSEC stocktaking

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

Table 8: Classification of capabilities in electrotechnical standardisation

¹Libya is a passive member



1.4 African Organization for Standardisation (ARSO)

African Organization for Standardisation (ARSO) is Africa’s intergovernmental standards body. It was formed by the OAU (currently AU) and United Nations Economic Commission for Africa (UNECA) in 1977 in Accra, Ghana.

The fundamental mandate of ARSO is to develop tools for standards development, standards harmonization, and implementation of these systems with the aim of facilitating intra-African trade and international trade of goods

and services. ARSO is an observer member of International Organization for Standardization (ISO) and has also signed a Memorandum of Understanding with CEN.

ARSO membership is drawn from African countries through their National Standards Bureaus (NSBs) that pay annual membership fees.

NSBs may be joint public/private sector bodies, statutory autonomous bodies, standards associations or government bodies, depending on the capacity of an NSB and modality of its establishment.

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 9: Classification criteria for standardisation

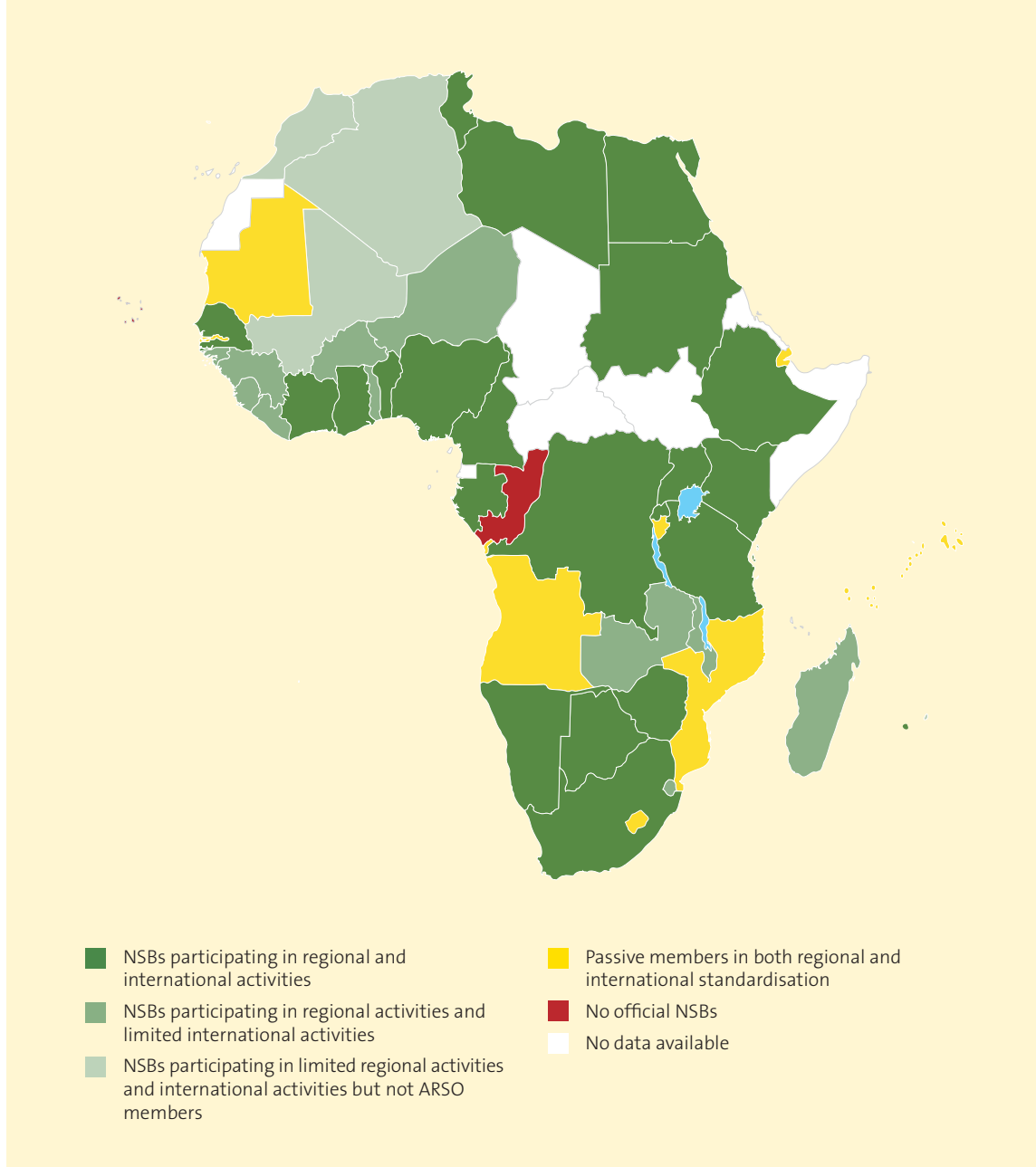


Figure 5: ARSO stocktaking

CATEGORY	COUNTRY
1	Benin, Botswana, Burkina Faso, Cameroon, Cote D'Ivoire, DR Congo, Egypt, Ethiopia, Gabon, Ghana, Kenya, Libya, Mauritius, Namibia, Nigeria, Rwanda, Senegal, South Africa, Sudan, Tanzania, Tunisia, Uganda, Zimbabwe
2	Guinea, Guinea Bissau, Liberia, Madagascar, Malawi, Niger, Seychelles, Sierra Leone, Swaziland, Togo, Zambia
3	Algeria, Mali, Morocco
4	Angola, Burundi, Eritrea, Gambia, Lesotho, Mauritania, Mozambique
5	Congo Brazzaville

Table 10: Classification of capabilities in standardisation

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						1.2
3	BENIN						1.8
4	BOTSWANA						2.4
5	BURKINA FASO						1.6
6	BURUNDI						1.0
7	CAMEROON						1.6
8	CAPE VERDE						0
9	CAR						0.2
10	CHAD						0.2
11	COMOROS						-
12	CONGO BRAZZAVILLE						0.4
13	COTE D'IVOIRE						1.8
14	DR CONGO						2.4
15	DJIBOUTI						0
16	EGYPT						3.6
17	ERITREA						0.4
18	ETHIOPIA						2.4
19	EQUATORIAL GUINEA						0
20	GABON						1.4
21	GAMBIA						0.6
22	GHANA						2.4
23	GUINEA						1.0
24	GUINEA BISSAU						0.8
25	KENYA						3.4
26	LESOTHO						1.2
27	LIBERIA						0.6
28	LYBIA						2.2

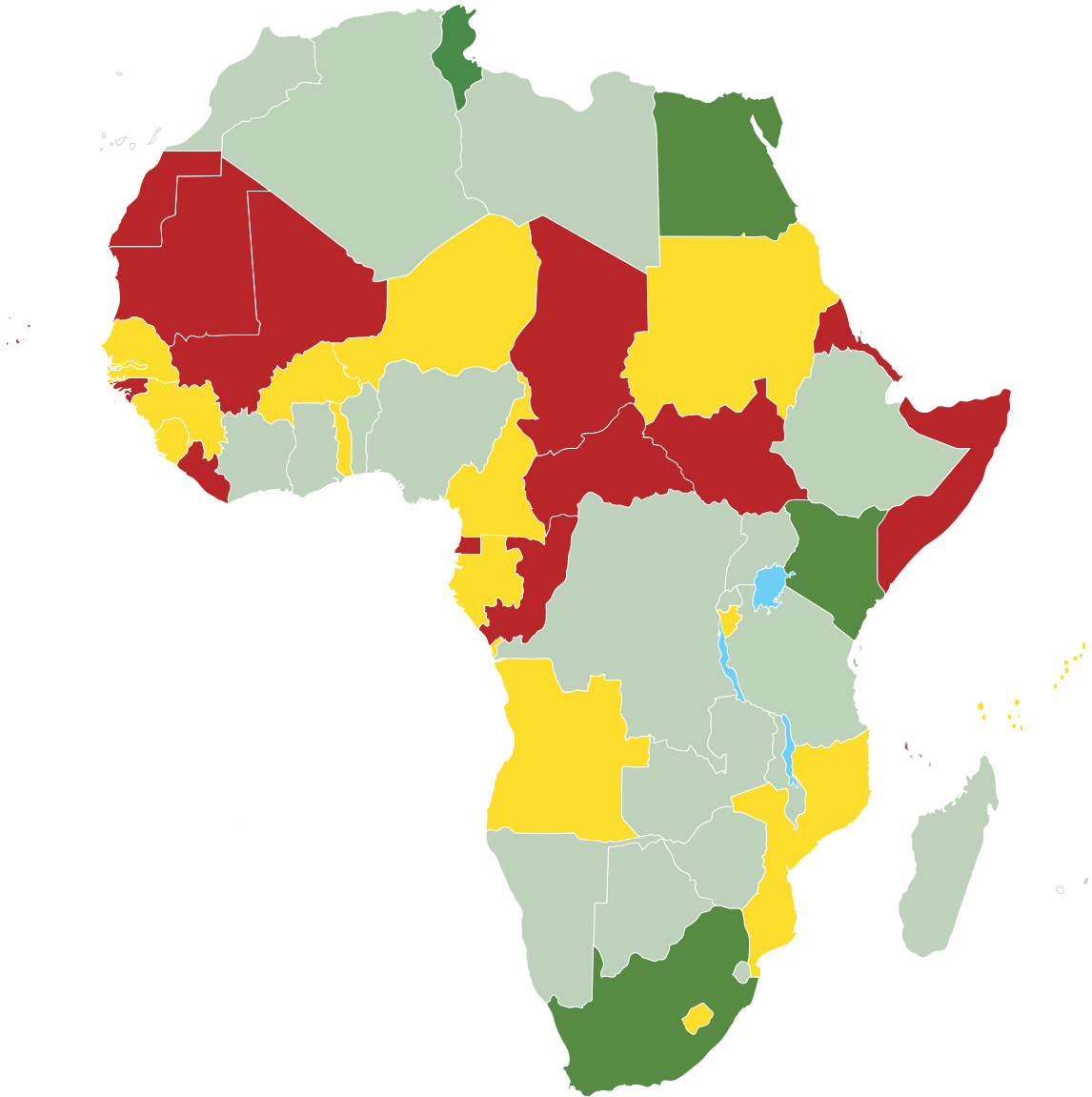
NO	COUNTRY	AFRAC	AFRIMETS		AFSEC	ARSO	PAQI ranking
			Sc. & Ind. Metrology	Legal Metrology			
29	MADAGASCAR						1.8
30	MALAWI						2.0
31	MALI						0.8
32	MAURITANIA						0.6
33	MAURITIUS						2.4
34	MOROCCO						2.2
35	MOZAMBIQUE						1.6
36	NAMIBIA						2.4
37	NIGER						1.2
38	NIGERIA						2.2
39	REUNION						-
40	RWANDA						1.8
41	SAO TOME AND PRINCIPE						-
42	SENEGAL						1.6
43	SEYCHELLES						1.8
44	SIERRA LEONE						1.2
45	SOMALIA						0
46	SOUTH AFRICA						3.8
47	SOUTH SUDAN						0.2
48	SUDAN						1.6
49	SWAZILAND						1.8
50	TANZANIA						2.2
51	TOGO						1.0
52	TUNISIA						3.4
53	UGANDA						1.8
54	WESTERN SAHARA						0
55	ZAMBIA						2.2
56	ZIMBABWE						2.4

2.2 Criteria for classification

	CATEGORY	Weight Score	Score range	Countries
1		4	3.3-4.0	Egypt, Kenya, South Africa, Tunisia
2		3	2.5-3.2	
3		2	1.7-2.4	Algeria, Benin, Botswana, Cote d'Voire, DR Congo, Ethiopia, Ghana, Libya, Madagascar, Malawi, Mauritius, Morocco, Namibia, Nigeria, Rwanda, Seychelles, Swaziland, Uganda, Tanzania, Zambia, Zimbabwe
4		1	0.9-1.6	Angola, Burkina Faso, Burundi, Cameroon, Gabon, Guinea, Lesotho, Mozambique, Niger, Senegal, Sierra Leone, Sudan, Togo,
5		0	0-0.8	Cape Verde, Central African Republic, Chad, Congo Brazzaville, Djibouti, Eritrea, Equatorial Guinea, Gambia, Guinea Bissau, Liberia, Mali, Mauritania, Somalia, South Sudan, Western Sahara
	Not categorized	-	-	Comoros, Reunion, Sao Tome and Principe

The highest average = 4, the lowest average = 0

2.3 Stocktaking Map of Quality Infrastructure in Africa



- Well developed QI
- Reasonably developed QI
- Partially developed QI
- Limited QI
- Non or very limited QI

