

The Intra Africa System for Metrology; Report to the CCAUV

1. Introduction

During 2005, a group consisting of delegates from SADCMET, National Metrology Institute of South Africa (NMISA), the Physikalish Technische Bundesanstalt (PTB), Legal metrology at the South African Bureau of Standards (SABS) and the New Partnership for Africa's Development (NEPAD) came together to discuss the formation of an umbrella body to further metrology in Africa, and the idea of an "intra Africa metrology system" was borne.

The first AFRIMETS workshop, held in March 2006 [1], was attended by delegates from more than 25 African countries. A draft MOU was prepared and a second workshop was held in September 2006. The first General Assembly meeting was held in July 2007 at the premises of NEPAD. The MOU was finalised and signed by 5 sub regional metrology organisations (SRMOs), namely SADCMET, EAMET, CEMACMET, SOAMET and MAGMET, representing 36 countries in Southern, Eastern, Central, Western and North Western Africa. Egypt currently is instrumental in the establishment of a sixth sub-regional metrology organisation in North Eastern Africa. It is expected that the new sub region will join AFRIMETS during 2008.

The main aim of AFRIMETS is to harmonise scientific, industrial and legal metrology issues across Africa and to operate as a fully fledged regional metrology organisation (RMO), fulfilling the obligations as stipulated in the mutual recognition arrangement of the international Committee for Weights and Measures, the CIPM MRA.

2. The Envisaged Economic Impact of AFRIMETS

The overall effect of a harmonised metrology system is expected to be huge. Africa's economy is commodity based and relies heavily on metal and agro exports. Instability in key regions, serious skills shortages, droughts and other national disasters hampers economic development.

Trade and in particular increased market access for Africa's exports is critical to the recovery and sustained development of the continent, and for its integration into the global economy. In order to lay the basis for Africa's effective participation in global trade; strengthen its negotiations with major trading partners; ensure improvements in Africa's competitiveness in production; expand and diversify its basket of goods and services for export markets, there is urgent need for a strong, sustainable and integrated approach to the continent's quality infrastructure. This includes metrology, standards, testing, accreditation (SQAM) and quality assurance – issues which increasingly are assuming greater significance as technical barriers to trade.

Globalization of world trade and requirements of the Agreement on Technical Barriers to Trade (TBTs) of the WTO for the reduction of non-tariff barriers to trade, urgently call for measures to develop, strengthen and consolidate SQAM structures. Furthermore, the implementation of trade agreements under the WTO requires the existence of an internationally recognized system of comparable and traceable measurements. This requires the existence of an international network of national metrology laboratories, recognized by

regulators and legislators and in which trading partners can have confidence and to which all the industrial and other measurement, calibration and testing laboratories can refer.

In order to enlarge and strengthen the export possibilities for products from Africa and to enable our countries to measure and test products that they import, it is crucial that confidence be established in the measurement and test results that they carry out.

The need for an internationally accepted and reliable measurement system in place is now understood by governments, trade authorities and regulators. An internationally recognized quality infrastructure across Africa is therefore a high priority. To date, only SADC has put in place such an internationally credible and recognized SQAM infrastructure encompassing Standards (SADCSTAN), Accreditation (SADCA), and Scientific and Industrial and Legal Metrology (SADCMET and SADC MEL).

Other non-tariff barriers affecting market access are the Sanitary and Phyto-Sanitary measures (SPS). These measures address different aspects of quality of life including plant protection, food (FAO), bio-safety (GMOs) and health aspects (WHO). Proper implementation of the SPS measures require reliable, internationally recognized traceable and comparable measurements. For Africa, the lack of a well developed and integrated infrastructure to address TBTs and SPS issues is hindering development as it raises the vulnerability to non-tariff barriers to trade, that in turn delays market access and further industrial and economic development. A harmonized metrological activity can be the stimulus to foster more trade from grassroots level (foodstuffs), commodities and manufacturing. It is to this effect that AFRIMETS aims to not only strengthen the measurement capabilities but also to raise awareness amongst governments of the importance of an integrated infrastructure.

This is a tremendous task that can not be implemented by the individual NMIs. AFRIMETS plans to assist to find funding to implement the programs in this paper. Funding is already sourced from various organisations such as the PTB of Germany, the South African Department of Trade and Industry (**the dti**), the European Union (EU) through the SADC EU project and African governments. Further donor funding will be sought from the Americas and Asia Pacific.

3. The Structure and Members of AFRIMETS

AFRIMETS consists of 5 sub regional metrology organisations as principal members and individual countries not belonging to SRMOs as ordinary members. The overall structure is shown in figure 1 and the regional map in figure 2.

AFRIMETS STRUCTURE

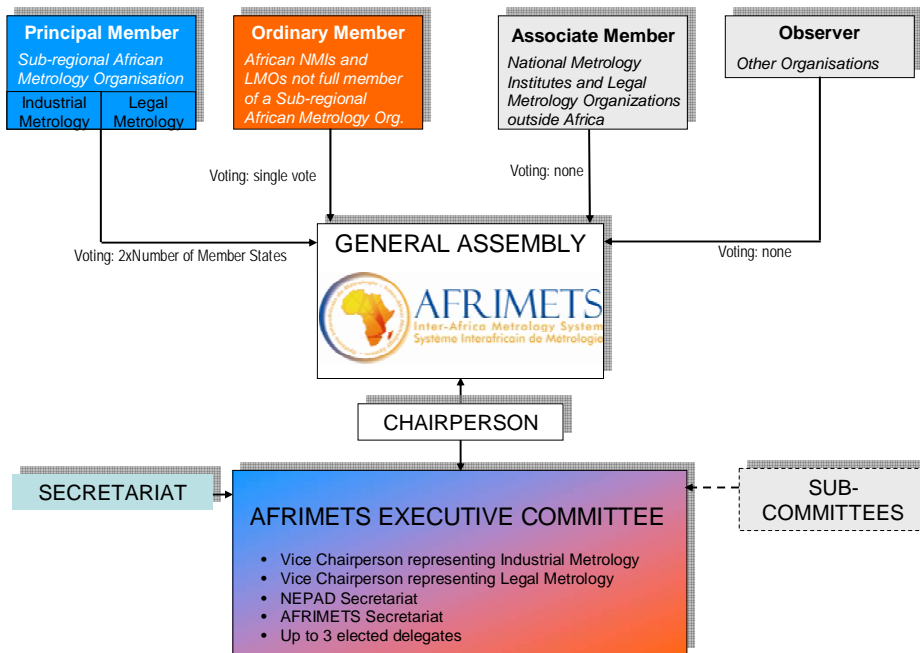


Figure 1: The structure of AFRIMETS.

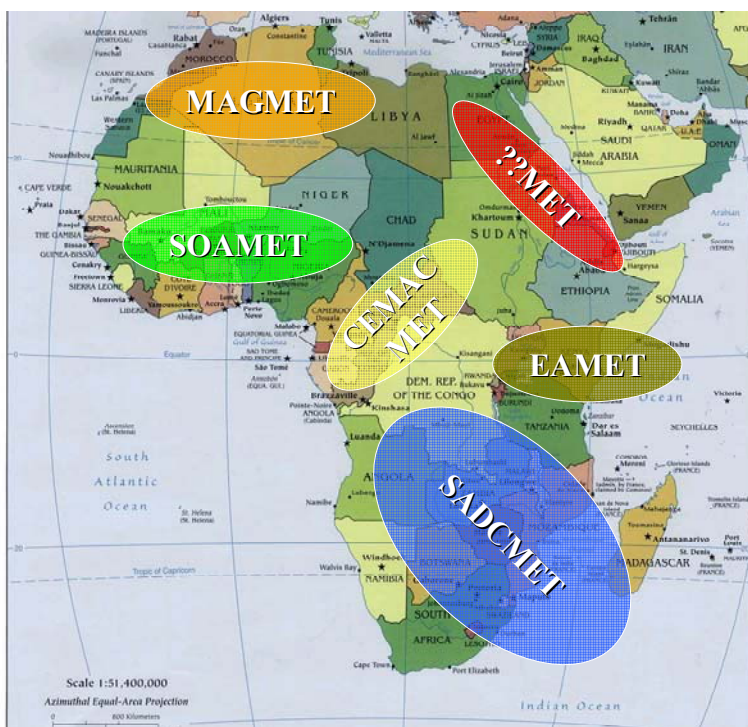


Figure 2. Map of the sub regional metrology organizations of AFRIMETS.

The Principal (SRMO) and Ordinary (country) members are shown in table 1.

Table 1. The individual SRMO and Ordinary Members of AFRIMETS

SADCMET	SOAMET	CEMACMET	EAMET	MAGMET	Ordinary Members
Angola Botswana DRC Lesotho Madagascar Malawi Mauritius Mozambique Namibia Seychelles* South Africa Swaziland Zambia Zimbabwe	Benin Burkina Faso Guinea Bissau Mali Niger Senegal Togo	Cameroon Central African Rep Chad Congo Brazzaville Equatorial Guinea Gabon Sao Tome**	Kenya Tanzania Uganda Rwanda Burundi	Morocco Algeria Tunisia	Nigeria Cote d'Ivoire

* Seychelles terminated SADC membership but has again applied for membership of SADC and SADCMET

** Sao Tome is a member of CEMAC but membership of CEMACMET has not been confirmed

Sub-regional Metrology Co-operations in Africa

The 5 sub regional metrology co-operations in operation in Africa were formed from the respective economic blocks as discussed below. However, as indicated earlier on, only SADCMET is internationally recognised and participates in activities of the BIPM/CIPM.

3.1 West-Africa - UEMOA (Union Economique et Monétaire Ouest Africaine)

In West Africa considerable effort has been made by the UEMOA in setting up regional structures in the field of standards (NORMCERQ), accreditation (SOAC) and metrology (SOAMET). The SOAMET (Secrétariat Ouest Africain de Métrologie) will coordinate the metrological activities in the sub-region and assure the traceability to the SI units. Future plans include that the SOAMET shall be extended to the ECOWAS countries.

3.2 East Africa - EAC (East African Community)

The EAC Protocol on Standardisation, Quality Assurance, Metrology and Testing (2001) has mandated the East African Standards Committee with the coordination of regional SQMT activities. 4 technical Sub-Committees have been created, one of them the Metrology Sub-Committee, which is responsible to coordinate metrological activities in the sub-region and assure traceability to the SI units. The chair and secretariat are held by one of the partner states on a rotational basis.

3.3 North West Africa - Maghreb (الـمـغـرـبـيـة al-Mağrib al-Arabi)

Maghreb, also rendered *Maghrib* (or rarely *Moghreb*), meaning "place of sunset" or "western" in Arabic. It is generally applied to all of Morocco, Algeria, and Tunisia but in older Arabic usage pertained only to the area of the three countries between the high ranges of the Atlas Mountains and the Mediterranean Sea. The Arab states of North Africa established the Arab Maghreb Union in 1989 to promote cooperation and economic integration. Its members are Morocco, Algeria, Tunisia, Libya and Mauritania.

Informal technical regional cooperation in the Maghreb region exists between the neighbours Algeria, Morocco and Tunisia since 2003. Regional training, sensitization and a first comparison in mass are the main components of this regional cooperation.

3.4 Central Africa - CEMAC (Economic and Monetary Community of Central Africa)

CEMAC (from its name in French, *Communauté Économique et Monétaire de l'Afrique Centrale*) is an organization of states of Central Africa established to promote economic integration among countries that share a common currency, the CFA franc. CEMAC is the successor of the Customs and Economic Union of Central Africa (UDEAC), which it completely superseded in June 1999 (through an agreement from 1994). Its member states are Cameroon, the Central African Republic, Chad, the Republic of the Congo (Brazzaville), Equatorial Guinea, Gabon and Sao Tome. CEMAC's objectives are the promotion of trade, the institution of a genuine common market, and greater solidarity among peoples and towards under-privileged countries and regions. In 1994, it succeeded in introducing quota restrictions and reductions in the range and amount of tariffs. Currently, CEMAC countries share a common financial, regulatory, and legal structure, and maintain a common external tariff on imports from non-CEMAC countries. In theory, tariffs have been eliminated on trade within CEMAC, but full implementation of this has been delayed. Movement of capital within CEMAC is free.

3.5 Southern Africa (SADCMET)

The Southern African Development Community (SADC) was formed in 1992, although a loose alliance of nine members existed since 1980. It currently has fourteen member states, which are: Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe. The objectives of SADC include achieving active development and economic growth; alleviating poverty; enhancing the standard and quality of life of the people of Southern Africa; amongst others. As part of the quality infrastructure, SADCMET was formed at the same time. The formation of this cooperation coincided with the formation of several other regional bodies within SADCMET, specifically the technical committee and working group structures.

The SADC Standards, Quality Assurance, Accreditation and Metrology (SQAM) program was established to progressively eliminate Technical Barriers to Trade (TBT) in the region, and between SADC and other regions in the world. This program is overseen by the SADC Directorate Trade, Finance, Industry and Investment. The SADC quality infrastructure includes several formal entities, established to perform specific functions of the SQAM program, of which SADCMET is one. The others are the SADC Cooperation in Legal Metrology (SADCMEL), the SADC Cooperation in Accreditation (SADCA), and the SADC Standardization Cooperation (SADCSTAN).

The NMISA is the most prominent NMI in the region. It has 18 laboratories performing measurements in all the physical parameters, such as length, time, pressure, volume, mass, electrical quantities, such as voltage, resistance and current, optical radiation, ionising radiation, temperature, and many more. Chemical metrology is also well established, with

laboratories for gas metrology, surface analysis, inorganic analysis, and most recently, organic analysis and bio analysis.

4. The Objectives and Activities of AFRIMETS

The overall aim of AFRIMETS shall be to promote metrology and related activities in Africa with the view of facilitating intra–African and international trade (especially to overcome technical, sanitary and phyto-sanitary barriers to trade) and to ensure safety, health, consumer and environmental protection.

In this regard, the Members intend to collaborate to promote the coordination of metrological activities and services in order to achieve greater harmony of measurement and testing within Africa and build mutual confidence in measurement between members and trading partners.

The following direct objectives have been identified in the AFRIMETS MOU.

- a) Create awareness in Metrology in Africa at all levels of society and government;
- b) Assist in the development and/or strengthening of the metrology infrastructure in each country/sub-region on the continent;
- c) Contribute to the development of a conformity assessment and regulatory infrastructure as required and to promote equity in trade;
- d) Foster competitiveness and quality in the manufacturing sector in order to promote trade and commerce;
- e) Contribute to the development of the metrological infrastructure required to protect the environment and to promote the general well-being of the population, including its health, safety and the protection of consumers from fraudulent dealings where measurements are used as the basis for the transaction;
- f) Develop a closer collaboration between Members;
- g) Improve the level of metrology, and to assist members in gaining international recognition;
- h) Improve the traceability of measurement standards within Africa to international standards as defined in the international system of units (SI), and to generally promote the International Committee of Weights and Measure’s Mutual recognition Arrangement (CIPM MRA) and the objectives of the Metre Convention;
- i) Encourage measurement traceability in Africa through recognized calibration services;
- j) Promote the adoption of International Organisation of Legal Metrology (OIML) technical recommendations or other relevant international standards as technical regulations wherever possible and harmonize technical regulations in Africa in order to minimise technical barriers to trade.

AFRIMETS is undertaking the following activities:

A. Capacity Building

- a) Facilitate projects and infrastructure development on measurement standards and legal metrology and foster cooperation in research between Members;
- b) Link sub-regional databases of services and capabilities not yet accepted in the CIPM MRA database;

- c) Transfer expertise in the field of measurement standards and legal metrology between Members through seminars, conferences, workshops, training programs, consultancies and technical publications.

B. *Coordination and Networking*

- a) Coordinate inter-laboratory comparisons of measurement standards in sub-regions in order to gain international recognition of measurement capabilities of NMIs;
- b) Collaborate with other bodies within Africa that are active in standards, testing and conformance;
- c) Encourage and support harmonization of approaches to achieve measurement traceability through the adoption of CIPM recommendations where available or through the development of African recommendations;
- d) Encourage and support harmonization of technical regulations through the adoption of OIML recommendations where available or through the development of African recommendations.

C. *Advocacy*

- a) Facilitate awareness of relevant stakeholders in Metrology;
- b) Encourage participation in comparisons and other proficiency testing activities organized by the consultative committees of the CIPM and the International Bureau of Weights and Measures (BIPM) and their equivalents in legal metrology;
- c) Fulfill the RMO duties within the Joint Committee for Regional Metrology Organizations and the BIPM (JCRB);
- d) Establish and maintain effective links with other international and regional metrology bodies, e.g BIPM, OIML, the European Association of National Metrology Institutes (EURAMET), the European Cooperation in Legal Metrology (WELMEC); the Inter-American Metrology System (SIM); the Euro-Asian Cooperation of National Metrological Institutions (COOMET); the Asia Pacific Metrology Programme (APMP) and the Asia Pacific Legal Metrology Forum (APLMF);
- e) Encourage membership of the Metre Convention and/or the OIML;
- f) Encourage participation in the global MRA in measurement standards established by the CIPM;
- g) Encourage participation in the OIML Mutual Acceptance Arrangement(s).

AFRIMETS endeavours to take over the RMO role from SADC MET during 2008. Technical committee and working group structures are currently being established.

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