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Book

Does Uganda have the necessary manufacturing standards framework to pursue the NDP III's import replacement strategy?

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ECONOMIC POLICY RESEARCH CENTRE

DOES UGANDA HAVE THE NECESSARY MANUFACTURING STANDARDS FRAMEWORK TO PURSUE THE NDP III'S IMPORT REPLACEMENT STRATEGY?

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ABSTRACT

This study assesses Uganda's legal, regulatory and institutional standards framework in pursuit of the third National Development Plan's import replacement/export promotion strategies. Using the National Standards Capability Assessment Framework, the study conducts a mini-survey of the manufacturing sector and key informant interviews to establish the status of Uganda's legal, regulatory and institutional standards framework. The results show that despite efforts to create the legal, regulatory and institutional framework for standards, several challenges still exist in the implementation that need to be addressed to achieve the strategy's objectives. These include; outdated laws, corruption, inadequate funding to the Uganda National Bureau of Standards (UNBS), and the lack of awareness about standards among stakeholders. We recommend that there is a need to regularly evaluate laws, regulations, and policies related to standards to address gaps in their implementation; understand what the manufacturers/traders need and how they can be supported to adhere to standards; increase training and staffing for UNBS to address human resource gaps, and empower the local authorities to know what standards are, and to report the culprits who do not meet the basic requirements for standards as a way of strengthening enforcement.

ABBREVIATIONS

COVID-19	Coronavirus Disease 2019
EAC	East African Community
EAS	East African Community standards
ICT	Information, Communication Technologies
IRS	Import Replacement Strategy
ISO	International Organization for Standardization
KIIs	Key Informant Interviews
MDAs	Ministries, Departments And Agencies
MTIC	Ministry of Trade Industry and Cooperatives
NDP	National Development Plan
NPA	National Planning Authority
NSCAF	National Standards Capability Assessment Framework
TCs	Technical Committees
UMA	Uganda Manufacturers Association
UNBS	Uganda National Bureau of standards
URA	Uganda Revenue Authority
URSB	Uganda Registration Services Bureau

GLOSSARY

Accreditation	Accreditation is the procedure by which an authoritative body formally recognises that an organisation or person is competent to carry out specific tasks. Accreditation is sought voluntarily as proof of competence in a given area.
Calibration	Calibration determines the relationship between an instrument's input and the magnitude of the response of its output.
Certification	Certification is the provision by an independent body of written assurance (a certificate) that the product, service, or system in question meets specific requirements. Certification is also known as a third-party conformity assessment.
Conformity assessment	This involves a set of processes that show your product, service, or system meets the requirements of a standard.
Inspection	Inspection describes the regular checking of a product to ensure it meets specified criteria.
Metrology	Metrology is the study of a system of measures. Scientific metrology is the branch of metrology concerned with developing measurement standards and promoting their acceptance and equivalence. Legal metrology comprises the legislative, administrative, and technical procedures established to regulate the credibility of measurements related to official controls, trade, health, safety, and the environment.
Testing	Testing is the determination of one or more of an object or product's characteristics and is usually performed by a laboratory.

1.0. INTRODUCTION

The Government of Uganda formulated the third National Development Plan (NDP III) and identified 20 key development strategies for its successful implementation. Key among these is the Import Replacement or Promotion of Local Manufacturing Strategy. Implementing the Import Replacement Strategy (IRS) would enable the country to attain self-sufficiency, increase forward and backward linkages, improve the balance of trade, complement export promotion in the medium to long term, enhance competitiveness, and strengthen the private sector, among others (NPA, 2020).

The novel Coronavirus Disease-2019 (COVID-19) generated behavioural and supply chain disruptions that further amplified the need to fast-track the operationalisation of Uganda's IRS. This strategy aims at increasing the range of products and scale for import replacement and improving the terms of trade. The ultimate goal is to realise; an increased share of manufactured exports in total exports, growth in the industrial sector contribution to the gross domestic product, and an increased share of the labour force employed in the industrial sector (ibid). The strategy also intends to strengthen the legal and institutional framework to support manufacturing, notably to formulate, implementing and enforce standards, laws, and regulations to facilitate the adoption of green manufacturing (which is the point of focus for this study).

At the same time, the Government of Uganda launched a new National Industrial Policy (2021)[1] as an incentive for industrial development, economic transformation, and wealth creation. The policy addresses trade imbalances through the development of import replacement, lowering costs of industrial finance, and improving integration with agriculture and mineral exploitation, among other domestic natural resources. The country also has several complementary policies[2], laws, and regulations that address specific issues within the National Quality Infrastructure (covering standardisation, testing, measurement, certification and accreditation) and the institutional framework for Quality Infrastructure and technical regulation.

The public and private sectors carry out technical regulation, standards, metrology, accreditation and conformity assessment (inspection, laboratory testing and certification) activities in Uganda. Apart from the Uganda National Bureau of Standards (UNBS), other ministries, departments and agencies (MDAs)[3] support the development of standards and administer technical regulations. Statutory agencies[4] also carry out standardisation activities. In addition, several laboratories in various MDAs, academic and research institutions undertake activities such as testing and measurements that support the standards and quality infrastructure. Some accredited private sector laboratories and firms also offer conformity assessment services.

Although Uganda has endeavoured to develop the quality of its standards infrastructure, it is yet to reach its full potential, especially in responding to the envisaged Import Replacement Strategy. Uganda has so far developed about 3,600 standards. The National Standardization Strategy (2019/20 – 2021/22) projects the development of approximately 2,064 extra standards over three years, covering Chemical and Consumer Products (638), Engineering and Construction (665), Food and Agriculture (428) and Systems and Services (313). However, the country needs to develop more standards to replace imports and penetrate new markets. Also, the national quality

1 http://www.mtic.go.ug/wp-content/uploads/2019/08/National-Industrial-Policy.pdf

2 These include: National Industrial Policy (2008); National Trade Policy (2008); National Health Policy (2009);National Tourism Policy (2003) and National Tourism Act of 2008; Food and Drugs Act, Cap 278; Uganda National Bureau of Standards Act, Cap 327; Weights and Measures Act, Cap 103; National Environment Act, Cap 153 and accompanying Regulations (1998); the Water Act, Cap 152; Electricity Act, Cap 145; Public Health Act, Cap 281; Fish Act, Cap 197; Local Governments Act, Cap 243; Uganda Communication Commission Act, Cap 106; Petroleum Supply Act, 2003; Adulteration of produce Act, Cap 27 and enabling Regulations of 2003; Sale of Goods Act, Cap 82; EAC SQMT Act 2006; Hotels Act, Cap 90; Copy right Act, Cap 215; Insurance Act, Cap 213; Control of Agricultural Chemicals Act, Cap 29; and Customs and Excise Act, Cap 215. These policies, laws and regulations provide the foundation for implementing of the standards and quality policy.

3 These include Ministries responsible for: Agriculture, Animal Industry and Fisheries; Works and Transport; Information and Communication Technology; Energy and Mineral Development; Gender, Labour and Social Development; Internal Affairs; Health; Water and Environment; Education and Sports; and Local Government.

4 National Drug Authority(NDA), National Environment Management Authority (NEMA), Electricity Regulatory Authority(ERA), Uganda Communications Commission(UCC), Uganda Coffee Development Authority (UCDA), Cotton Development Organization(CDO), Dairy Development Authority (DDA), Education Standards Agency(ESA), Uganda Tourism Board(UTB), Uganda Wildlife Authority(UWA), Uganda National Roads Authority(UNRA), Uganda Institute of Bankers(UIB), Institute of Public Accountants of Uganda (ICPAU), Civil Aviation Authority(CAA) and its affiliated regional and international organisations such as Civil Aviation Safety and Security Oversight Agency (CASSOA) and International Air Transport Association(IATA) and Uganda Insurance Commission (UIC)

infrastructure must attain some basic minimum standards to attain international equivalence. Once these are met, they would significantly enhance the competitiveness of local industries, promote fair trade, and protect the health and safety of the consumers, including preventing trade in sub-standard goods.

Whereas the IRS intends to strengthen the legal and institutional framework for standards to support manufacturing, the formulation and implementation process remains slow, and the national capacity is still inadequate to fully implement standards, as they require scientific, technical and legal expertise as well as sufficient infrastructure such as the laboratories (UNCTAD, 2020). In addition, inferior quality and fake manufactured products limit sector performance as they out-compete genuine products. Other challenges include the lack of awareness among consumers about the standards and poor adoption mechanisms for firms and producers.

Against this background, the study aims to examine Uganda's National Standards Framework in pursuit of NDP III's Import Replacement Strategy.

1.1 Objectives of the study

The overall objective of the paper is to assess Uganda's standards framework in pursuit of the NDP III's IRS. Specifically, the study aims to: analyse the legal, regulatory and institutional framework to implement and enforce standards; determine how the national standards are aligned to international standards; assess the adequacy of the existing infrastructure to implement these standards; to determine the effectiveness of the enforcement mechanism in fostering standardisation; and identify the challenges faced in conforming to standards.

The research questions answered by this study are: how applicable and effective is the legal, regulatory and infrastructural framework to implement and enforce standards to support the IRS? How adequate is the infrastructural apparatus to implement these standards? How effective is the enforcement mechanism in fostering standardisation? What challenges are faced in complying with technical requirements across different products and markets?

The rest of the paper is organised as follows; section 2 provides the conceptual framework, section 3 discusses the methodology, section 4 discusses the results, and section 5 presents the conclusion and policy recommendations.

2.0 CONCEPTUAL FRAMEWORK

The study adopts the National Standards Capability Assessment Framework (NSCAF) conceptualised

Table 1 The NSCAF Framework

	Pillar 1	Pillar 2	Pillar 3
	Standardisation	Conformity Assessment	Metrology
Category 1	Laws, systems and Institutions		
Category 2	Strategies and Implementation Plan		
Category 3	Stakeholders		
Category 4	Infrastructure		
Category 5	Human resources		
Category 6	Process		
Category 7	Outcome		

Source: Choi, D. G., Song, J. H., & Kang, I. K. (2014)

in Table 1. The NSCAF combines 3 (three) pillars of the national standards system (Standardisation, Conformity Assessment and Metrology), which are further examined under seven assessment categories to develop the full framework (Table 1).

However, this study excludes category 7 (seven) of outcomes and the computation and interpretation of results, as originally used by Choi *et al.* (2014).

In this report, the term '**standards framework**' describes "*a set of principles and ideas used to inform decisions and judgments regarding standards*." This includes the legal, regulatory, institutional and physical context, human and organisational actors and their interactions (Kurihara, 2006). According to the WTO[5], **Standards** generally "*specify the characteristics of a given product such as its size, shape, design, functions and performance, or the way it is labelled or packaged before it is displayed for sale*." Sometimes, how the product is created or manufactured can impact these features, which may necessitate the evaluation of 'technical regulations and standards' defining the product's manufacturing process as opposed to its characteristics per se (ibid).

Conformity assessment specifically relates to technical procedures and includes testing, verification, inspection and certification, which prove that products meet the required standards (ibid). In addition, the testing costs are primarily borne by the manufacturer or exporter. **Accreditation** assures that the infrastructure (laboratories), inspection and certification agencies meet the standardisation requirements.

Metrology, is a science of measurement that entails both experimental and theoretical processes at any level of uncertainty in any field of science and technology.[6] Metrology is categorised into; scientific metrology, applied metrology, and legal metrology[7]and actions related to metrology are managed by national laboratories.

Table 2 Seven Assessment Categories of the NSCAF

Seven Categories	Definitions
1. Laws, systems and Institutions	• The nation should prepare laws and systems related to standards, establish related institutions, and secure budgets for standards. It also involves assessing related laws and systems for each pillar, institutions to implement related laws and systems, and their size and budgets.
2. Strategies and Implementation plans	• The nation should establish and implement strategies and plans to develop national standards. This effort means responding to changes in domestic and overseas standards environments to align with national development strategies and draw up implementation plans accordingly.
3. Stakeholders	• The nation should identify the stakeholders of national standards and their needs and then reflect these needs in standards: Define stakeholders, identify and analyse stakeholders, reflect on their needs and arrange for feedback.
4. Infrastructure	• The nation should have a secure infrastructure, including facilities, equipment, and information technology for national standards activity and provide access to the infrastructure for all stakeholders: including IT system as well as their usage, and address human resources.
5. Human resources	• The nation should secure and manage human resources for national standards and create and operate mid-to-long-term programmes for nurturing human resources: Nurture human resources (training, qualifications, and criteria), a human resources management system, and the competency of human resources (scale and level)
6. Process	• The nation should establish and implement processes for a standard system's efficient operation.

Source: Choi, D. G., Song, J. H., & Kang, I. K. (2014)

5 https://www.wto.org/english/tratop_e/tbt_e/tbt_info_e.htm#:~:text=Conformity%20assessment%20procedures%20are%20technical,down%20in%20regulations%20and%20standards.

6 https://www.bipm.org/en/home

7 Legal metrology involves regulatory requirements of measures which are well established; Applied metrology measures are focused on manufacturing and other processes, calibration, and quality control; Scientific metrology is concerned with the creation of new systems of measurement, and how these standards are transferred to users.

3.0 METHODOLOGY

The study relied on a multi-pronged approach, including desk review, qualitative and quantitative methods to evaluate the national standards framework. These methods are explained in detail below.

3.1 Desk review

The study reviewed international and national literature regarding standards from development agencies/ institutions such as the International Standards Organization, World Trade Organization and United Nations Industrial Development Organization (UNIDO), and Policy documents including NDP III, National Industrial Policy, National Standards and Quality Policy, National Standardisation Strategy, Uganda National Bureau of Standards Act, Cap 327, Weights and Measures Act, Cap 103. The particular focus was on the three (3) pillars (standardisation, Metrology and Conformity Assessment) and their interaction with the six (6) categories as presented in the NSCAF framework). Therefore, the desk reviews helped to identify, classify and analyse the relevant laws, systems and institutions responsible for implementing and enforcing the guidelines and the overall national standards structure.

3.2 Qualitative methods

The study team conducted purposive key informant interviews (KIIs) with the relevant stakeholders, e.g. UNBS, particularly the managers from the Standards, Certification, Human Resource, Imports Inspection, Surveillance and Legal Metrology departments. We also interviewed officials from the Uganda Manufacturers Association, Ministry of Trade, Industries and Cooperatives (MTIC), and Consumer Education Trust – a consumer awareness and protection organisation. Structured questionnaires guided the data collection exercise and were developed in line with the NSCAF.

3.3 Quantitative methods

The study team collected data from the targeted formally registered manufacturers that are members of UMA. The focus on import replacement informed the study's choice of respondents. The survey purposively targeted 100 manufacturers spread across industrial clusters in Bombo, Kawempe, Luzira, Nakawa, Makindye, Namanve, Ntinda, Wakiso, Industrial Area and Nalukolongo. Out of the 100 sampled manufacturers, 59 firms responded to the survey. We developed a structured questionnaire to collect data from the sampled manufacturers.

The breakdown of the sampled firms is provided below by sub-sector (as per UBOS' [2020a] categorisation of the manufacturing sector) and firm size; based on the number of employees declared. Notably, one micro firm was excluded from the analysis because it was insignificant.

Table 3: Categorization of sampled manufacturers by sub-sector and firm size

	Sub-sector	Number of manufacturers
1	Food processing	20
2	Brick and cement	2
3	Chemicals, Paint, Soap & Foam Products	3
4	Drinks and Tobacco	9
5	Metal products	5
6	Saw-milling, Paper And Printing	4
7	Textile, clothing and footwear	1
8	Miscellaneous incl. plastic, furniture and other manufacturing nec	
	Plastic products	7
	Furniture	1
	Other manufacturing nec	3
	Cosmetics	4
	Total	**59**
	Firm size	
1	Micro	1
2	Small	28
3	Medium	8
4	Large	22
	Total	**59**

The 1(micro) firm had downsized due to covid-19

3.4 Data analysis

We employed descriptive statistics to analyse the quantitative data to compare how different manufacturers rated Uganda's Standards Framework based on their interactions with the different components and institutions, such as UNBS. We used thematic analysis to analyse the information from the key informant interviews. The analysis is done following six categories: laws, systems and institutions; strategy and implementation plan; stakeholders; processes, infrastructure; and human resources using a Likert scale. These were examined within the three pillars of standards, conformity assessment and metrology. The results are presented based on the firm size.

4.0 FINDINGS

In this section, we present the study's findings, starting with descriptive statistics explaining the performance of the standards framework based on the six categories[8] in Table 2 across the three pillars.[9] We then describe the relationship between each performance category and the three pillars.

4.1 Laws, Systems and Institutions

Laws, Systems and Institutions are key in the promotion of standardisation. The question is how often the laws are updated , their relevancy and applicability, and the efficiency of UNBS and related institutions in enforcing them. These laws and systems have to be reformed to meet the emerging needs for standards and the institutional requirements in terms of their size and budget to address standards needs effectively.

4.1.1 Standards: Updating laws on standards.

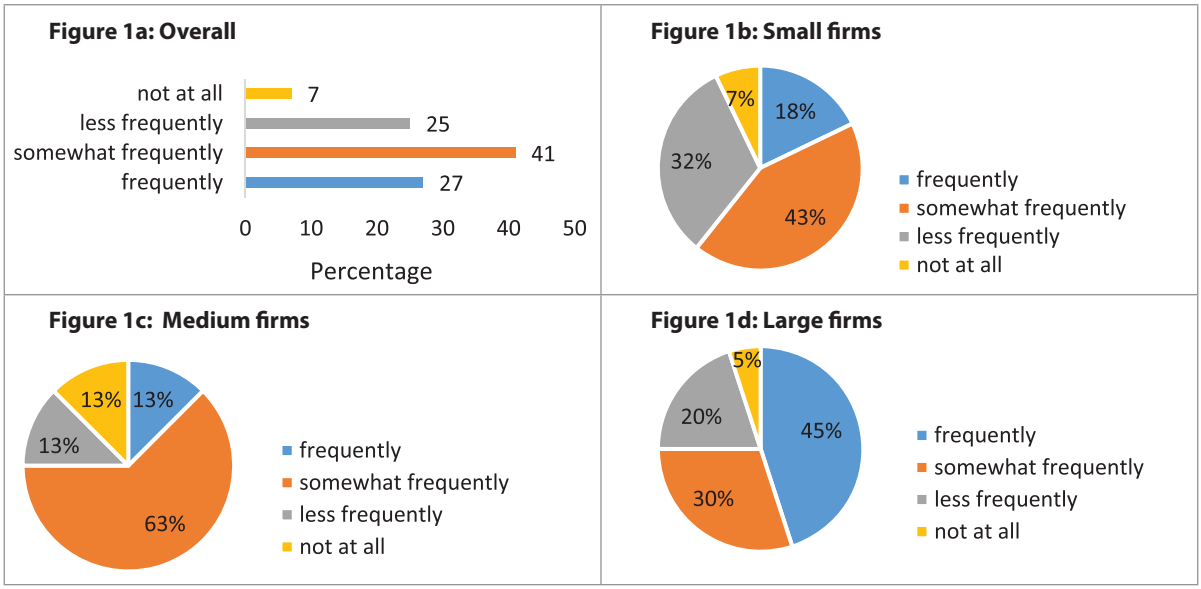
The National Standards Capability Assessment Framework (NSCAF) stipulates that the Quality Policy is a basic national policy "for establishing, formalising, and overseeing the development and performance of a Quality Infrastructure" (Choi *et al.*, 2014). Uganda's National Standards Quality Policy aims to strengthen the standards regulatory framework, infrastructure, human resources and support the public and private sector entities to comply with the set standards.

Whereas the laws on standards are supposed to be reviewed every five (5) years, interactions with officials from UNBS revealed that some laws and statutes had not been reviewed for more than five years, which could negatively affect the implementation of NDP III's import replacement strategy. Further, some of the proposed laws have remained as bills and thus are not implemented, though they are important for Uganda to realise the aspirations of the import replacement strategy. Examples include the UNBS Act 2013, Standards and Quality Policy, Trade Policy, Food and Drug Act, and the Competition and Consumer Protection Policy.

The manufacturer's views corroborate the earlier finding, with 41 percent (Figure 1a), on average (for all firms), showing that the laws on standards are not reviewed in time (somewhat frequently). In comparison, only 7 percent affirm that the laws were not changed. According to the scale of operation, 41 percent of small firms (Figure 1b), 63 percent of medium firms (Figure 1c) and 45% of large firms (Figure 1d) indicated that laws on standards are somewhat frequently reviewed. This suggests that firms can become more effective in their operations and statutory obligations if several outdated acts/laws relating to standards are updated, especially to support start-ups and small enterprises. This also necessitates the simplifying regulations to help them conform to standards as they make up a significant share of manufacturing.

8 Laws, systems and Institutions, Strategies and Implementation Plan, Stakeholders, Infrastructure, Human resources, Process and outcome.
9 Standardization, conformity assessment and metrology.

Figure 1: Reformation of laws and systems for standards



Source: Survey on standards (2021).

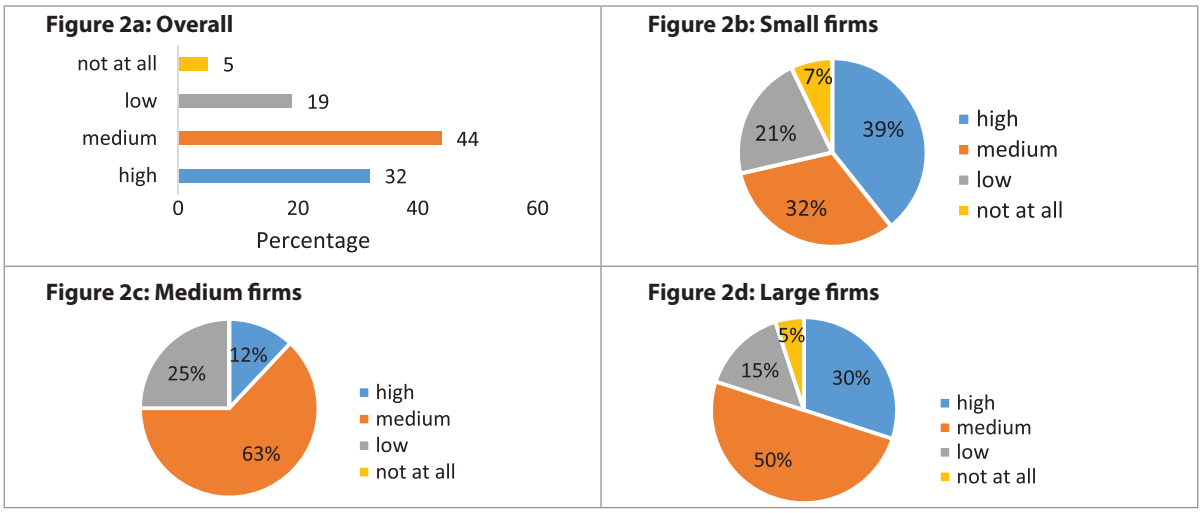
4.1.2 Conformity Assessment: relevance of laws on standards

NDP III aims to strengthen the legal and institutional framework, to support manufacturing by endorsing and enforcing local content laws, counterfeits, low-quality products and standards (NPA, 2020). Therefore, the relevance/applicability of laws and regulations on technical standards is very important. Also, conformity assessment provides consumers with confidence about the product's quality and enables regulators to ensure that health, safety or environmental conditions are met.

The existing laws on standards are relevant and applicable to Uganda's context, though some gaps remain. For instance, laws such as the UNBS Inspection and Clearance of Goods Regulation (2018) and the Certification Regulation are currently under review. These laws might negatively affect the inspection, monitoring, surveillance and enforcement of standards for products and services. Further, there have been delays in approving and ascent to the Accreditation Bill. However, once passed into law, it could pave the way for establishing the National Accreditation Body (UGANAS), reducing the costs of accreditation services paid by Ugandan conformity assessment bodies/ laboratories. It could also provide a platform to address national accreditation challenges in Uganda's pursuit to increase the market share for manufacturers locally, regionally and globally.

Overall, on average, 44 percent of the manufacturing firms indicate that the existing standards laws are relevant for effective conformity assessment (Figure 2a). Notably, the score was 39 percent for small firms (Figure 2b), 63 percent for medium firms (Figure 2c) and 50% for large firms (Figure 2d). This could point to the fact that SMEs are usually less efficient than medium and large firms in scrutinising and following the regulatory processes, which often limits their progress and development. This partly points to the fact that some manufacturers are unaware of the existing laws on ensuring that their products meet the set standards. Also, the costs associated with testing, certification and inspection might discourage small firms from following the law. Therefore, the benefits of undergoing conformity assessment, such as providing consumers with confidence about the product and enabling regulators to ensure that health, safety or environmental conditions are met, might not be enjoyed. Consequently, this greatly affects business operations.

Figure 2: Relevance/applicability of laws and regulations on technical standards



Source: Survey on standards (2021).

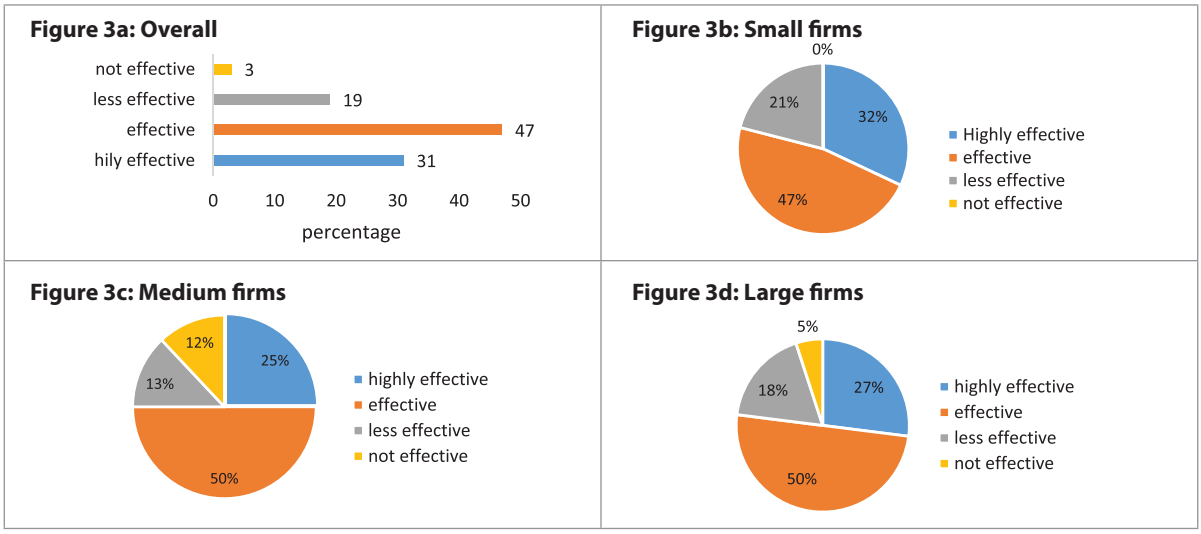
4.1.3 Metrology: enforcing the weights and measurements regulations.

Metrology is a key pillar in a country's quality infrastructure. The availability of a national measurement system can ensure that measurements are made with accuracy and reliability and can be related to other measurements made domestically or internationally (Harmes-Liedtke & Di Matteo, 2011). This is important in making certain that there is harmony in trade.

This study finds that there are efforts by UNBS to enforce weights and measures regulations by carrying out routine checks to ensure that firms are compliant. Despite these efforts, the compliance rate for firms is still low because of the gap in enforcement by UNBS arising from the insufficient financial and regulatory resources to support its work. UNBS is optimistic that once the Weights and Measures Act (1967) revision is concluded, and the Metrology Bills (one covering the industrial, scientific metrology, which looks at the science of measurements in research and the industry for the applications) are developed into laws, the institution will be better placed to enforce these laws and regulations.

On average, only 47 percent of the interviewed firms indicated that enforcing the weights and measurements

Figure 3 Efficiency of UNBS in enforcing the weights and measurements regulations



Source: Survey on standards (2021).

regulations is effective (Figure 3a). Much as UNBS carries out enforcement under metrology, the measures need not be very limiting for firms but provide flexibility to accommodate the variance by firm type and level of technology and innovation locally. For example, smaller firms are less likely to adhere to standards and regulations than medium or large firms and hence need more guidance on how to comply with standards. This can go a long way in supporting and boosting domestic production.

4.2 Strategies and Implementation Plans

Establishing strategies and implementation plans for developing national standards is important to drive Uganda's import replacement agenda. This involves crafting strategies to respond to changes in standards both locally and internationally and aligning outcomes to the NDP III.

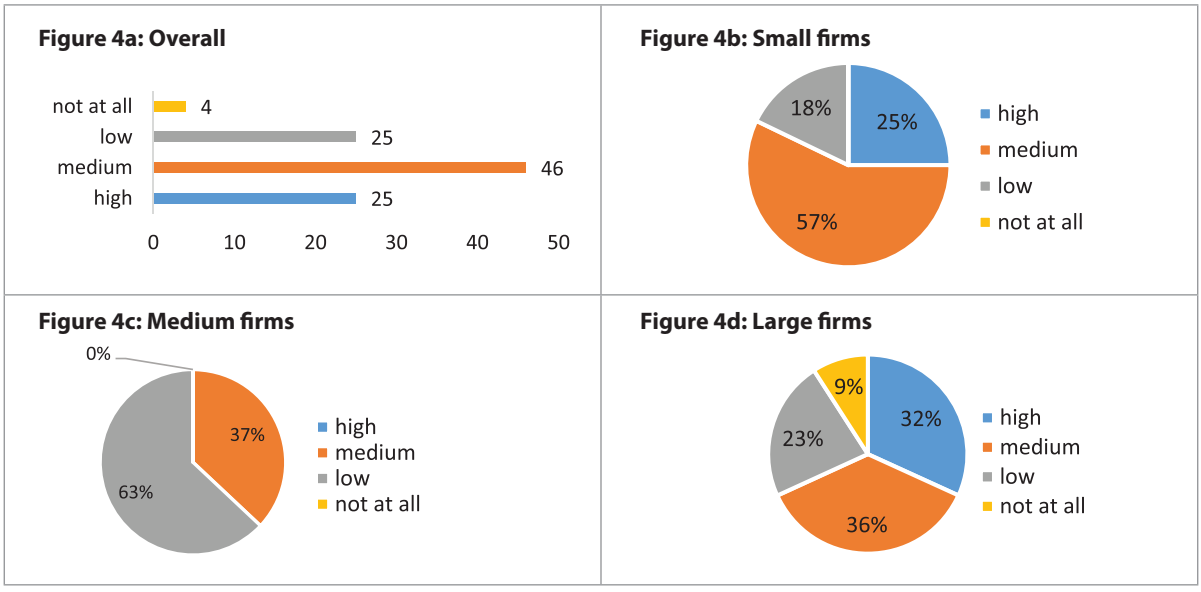
4.2.1 Standardisation: competence of the technical committees in drafting standards

Standards in Uganda are developed through technical committees (TCs). TCs are constituted to deliberate on specific standards and comprise representatives of all interested stakeholders such as manufacturers, traders, consumers, regulators, civil society, and other partners. UNBS share standards adopted by TCs with stakeholders (national and international) and the public for comments and, after that, presented to the National Standards Council.

There are ongoing efforts by UNBS to bring on board all relevant stakeholders to develop standards, thus ensuring inclusion in standards development. However, full participation in TCs is constrained by the limited funding for UNBS to organise and undertake such consultations. Further, some of the current members (and potential members) of the TCs require more capacity building to close the gaps in their technical competencies and capacity. The committee's work needs to be informed by research, as most of the standards and the clauses are mandatory. Consequently, passing standards without evidence-based research often results in compliance challenges.

Given the underlying challenges, the overall firms' rating of the quality and level of efficiency of the technical committees in drafting and finalising standards (considering the length of creating new standards and how often the TCs meet) was medium (46 percent) and only 4 percent rated not at all (Figure 4a). Large firms (36 percent) had a more negative opinion of the TCs. These scores further confirm that the aforementioned challenges affected the efficiency of the TCs.

Figure 4 Efficiency of the technical committees in drafting and finalising standards



Source: Survey on standards (2021).

4.2.2 Conformity Assessment: efforts to respond to changes in domestic and international standards environment.

The National Standardisation Strategy facilitates "the alignment of national standardisation activities to the obligations of regional and international standardisation mandates," and membership in regional and international agreements (UNBS, 2020a). Ideally, UNBS is supposed to achieve this by coordinating a National Technical Committee to participate in committees such as the Technical Barriers to Trade and Sanitary and Phytosanitary Committee and National Codex Committee. The committees agree on national positions on the agenda of the regional or international subjects before the representatives participate.

The study finds that local and international standards are adopted, and certification is done based on those standards. [10] This is, however, constrained by limited financial resources. For example, budget cuts on activities such as travel abroad limit the Bureau's participation in these activities. This was especially common during the first phase of the COVID-19 pandemic when the government implemented an across-the-board cut on travel abroad for all state ministries, departments and agencies. Although alternative measures such as virtual meetings were introduced, these are not as effective.

Overall, 71 percent of the firms indicated UNBS is less effective, especially in responding to the changes in international standards (Figure 5a). This shows that more effort is required to bring UNBS up to speed in line with the latest developments in standardisation.

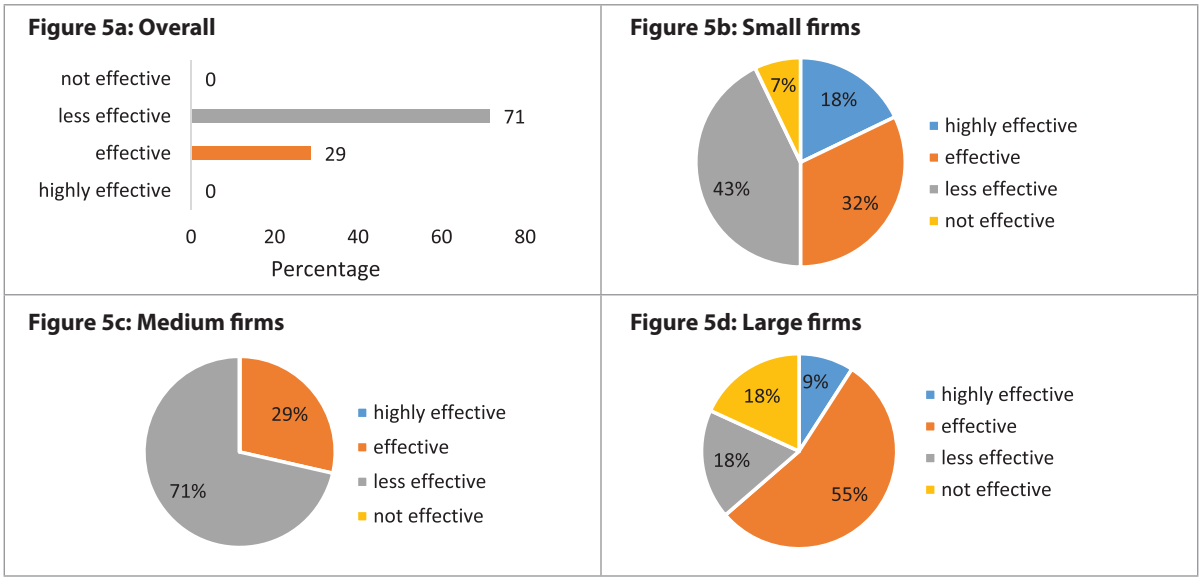
4.2.3 Metrology: establishing the authenticity/ accuracy of measurements.

According to the International Bureau of Weights and Measures (2021), a country should have an effective metrological infrastructure which is well funded to ensure correctness and consistency in measurements to suit the latest information and communication technologies (ICT) developments. Consumers and firms can then use these measurements as a yardstick to evaluate the activities of the relevant institutions.

In the same regard, KIIs with UNBS indicate that the metrology infrastructure is reasonably established and is still the most diversified or decentralised of the UNBS services. By implementing donor-funded programs, laboratories are better equipped to undertake conformity assessments, ease the calibration work and accelerate the certification process provided by the Bureau.

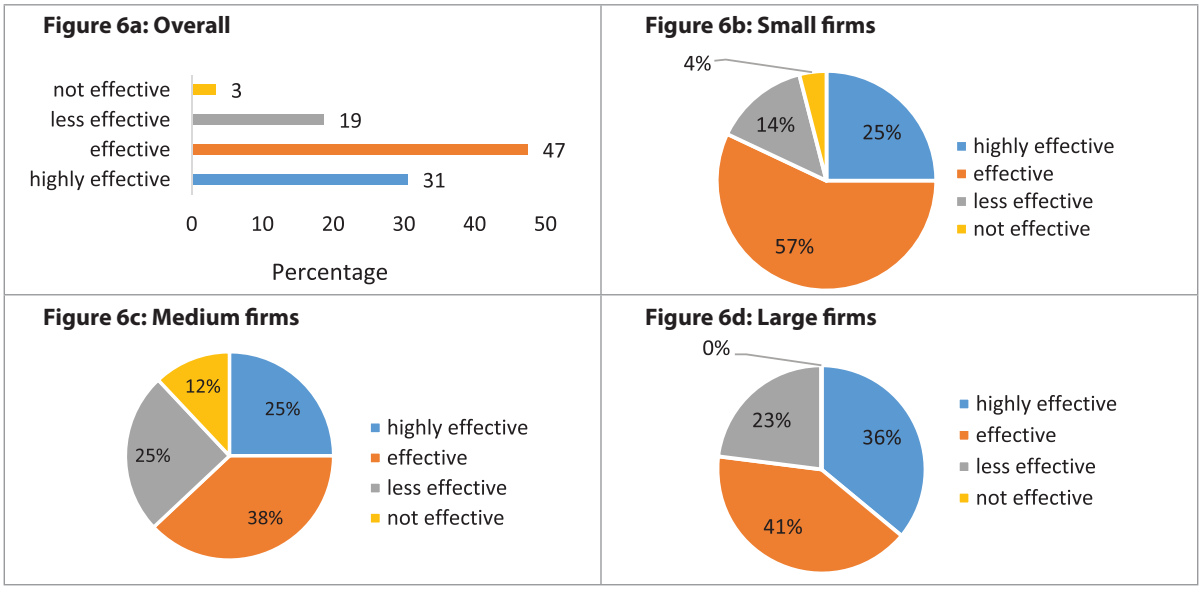
10 The local standards are peer reviewed by other regional bodies (such as EAC) to ensure that they meet their requirements and to establish equivalences. In addition, ISO standards of interest are adopted and implemented nationally and working groups are formed in that regard to address gaps. Thereafter the World Trade Organization (WTO) is notified for comments from members.

Figure 5 Efforts to respond to changes in domestic and international standards



Source: Survey on standards (2021).

Figure 6 Effectiveness of UNBS in establishing the authenticity/accuracy of measurements



Source: Survey on standards (2021).

However, on average, 47 percent of the manufacturers rated the Bureau as being effective in establishing the authenticity/accuracy of measurements of test results obtained either from laboratories of manufacturers or from other private or public laboratories (Figure 6a). We may attribute this to the cost associated with the measurement processes, which is borne by the manufacturer and traders, who are seldom knowledgeable about these procedures. The cost of measurement processes thus needs to be subsidised since firms usually find it challenging to allocate the required resources to the metrology function.

4.3 Stakeholders

The role of stakeholders is critical in developing quality standards. According to Choi et al. (2014), the country needs to identify the relevant stakeholders in the standardisation process, consider their needs and provide room for feedback. This helps to prepare and address the implementation challenges and the coordination between UNBS and its stakeholders.

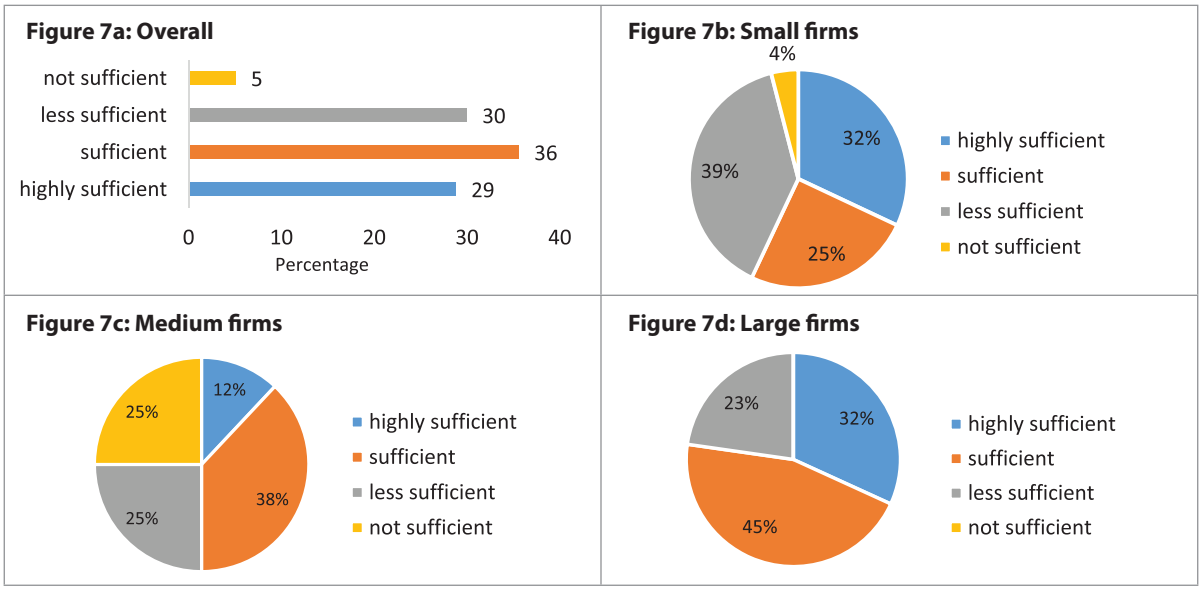
4.3.1 Standardisation: accommodating the needs of relevant stakeholders.

The national standards body has a role in developing standards-based on consensus – by considering the opinions of various stakeholders to whom such standards apply. In effect, the national standards body provides linkages and channels for national participation in developing international standards (ISO, 2010).

This study found that UNBS identifies stakeholders to participate in the formulation of standards through soliciting and headhunting. Sometimes, institutions are requested to send experts on standards to the TCs. UNBS also has a feedback mechanism such as holding stakeholder meetings annually or bi-annually to receive feedback on specific issues. Furthermore, standards are developed by a standards committee that draws representation from different stakeholders, e.g. government, academia, consumers, importers, exporters and manufacturers. UNBS acts as a Secretariat in the standards development process. Key informants revealed that available resources are insufficient to build stakeholders' capacity to participate fully and benefit from the standards development process – including articulating their needs.

The feedback from firms on the needs of relevant stakeholders (e.g. consumers, manufacturers, traders etc., considering how TC members are identified, represented and the coordination between UNBS and other stakeholders regarding standards) shows that the majority, 36 percent thought it was sufficient

Figure 7 Accommodating the needs of relevant stakeholders



Source: Survey on standards (2021).

(Figure 7a). Though they resonate that their feedback is only sought after everything has been finalised, which partly limits their active participation in developing the standards. Others point to the inadequate financial resources to engage in standardisation processes.

4.3.2 Conformity Assessment: engagement of stakeholders in the development of technical procedures for standards

Having mentioned that creating Quality Infrastructure involves various stakeholders, technical committees should thus have sufficient data availed to them to make informed judgements. We also document that UNBS initiates actions in partnership with other stakeholders, including the regional and international partners, to harmonise the effects of the organisation's legislations. The internal stakeholders include the management, UNBS staff and the National Standards Council, while the external stakeholders include groups or institutions[11] that impact UNBS activities and vice versa.

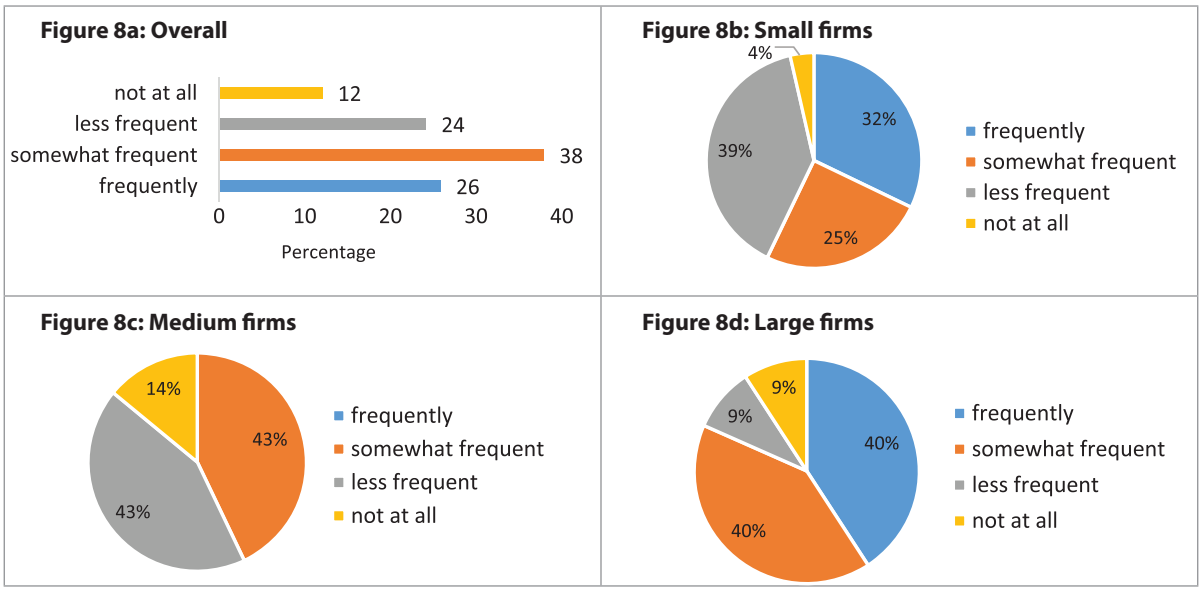
KIIs with the Bureau further detail the flexibility of stakeholders in initiating standards development after which UNBS benchmarks the given standard with international standards. Harmonisation of standards gives local manufacturers the confidence to produce for the local and export markets.

Firm perceptions of stakeholder engagement in developing technical procedures for standards assessment show that engagement is done somewhat frequently (38 percent) (Figure 8a). The justification is that involving manufacturers in standards processes does not infer that the system is effective. Notably, some small firms feel that their needs for standards are often unmet and overshadowed by those of large firms because they have more orderly representation and express their concerns better.

Thus, there is a need to conduct targeted campaigns to inform stakeholders about standards processes and fit their contributions into standards development.

11 These include Government Ministries and Departments, local communities, suppliers and trade associations, academia, research organizations and consumer groups. UNBS functions directly under the Ministry of Trade, Industry and Cooperatives; and the Ministry of Finance Planning and Economic Development, who provide policy guidance and funding respectively.

Figure 8 Engagement of stakeholders in the development of technical procedures for standards



Source: Survey on standards (2021).

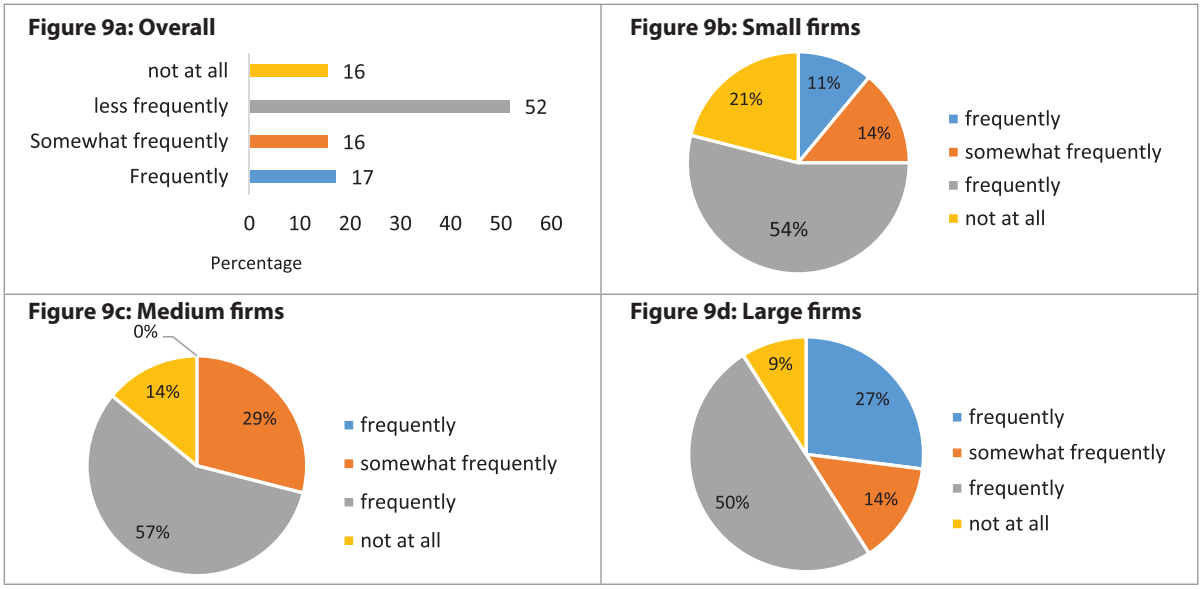
4.3.3 Metrology: participation of stakeholders in decision-making on the enforcement of legal metrology

ISO (2010) emphasises the importance of the legal metrology department in national standards and conformity infrastructure. This deals with approved measurement tools such as scales and other weighing devices, volume measures, gas and electricity meters etc. It also involves the regulation of the size of packaging for retail products.

KIIs with UNBS equally stress the significance of legal metrology as a scientific discipline of measurements that is regulated by law. As such metrology is not voluntary. Whereas UNBS has undertaken efforts to sensitise stakeholders and the public, informality is a widespread practice in Uganda. Some manufacturers do not operate under umbrella bodies such as UMA or Uganda Small Scale Industries Association. This limits their access to information, more so the micro, small and medium enterprises. Formality is also a sign of trustworthiness to the market, whereby registered firms largely provide better quality products due to their compliance with standards. In addition, KIIs with some members of the TCs reveal it is difficult to obtain thorough input from all stakeholders and hard to find suitable people to belong to the TCs. Unlike in other countries where membership in a TC is voluntary and much sought after, in Uganda, members need to be incentivised (sitting allowance) to participate in these activities.

On average, about 52 percent of the manufacturers indicated that stakeholders are engaged in decision-making less frequently (Figure 9a). Some manufacturers attribute this to the information asymmetry about the change in systems, affecting business activities and their failure to meet standards requirements.

Figure 9 Participation in decision-making on the enforcement of legal metrology



Source: Survey on standards (2021).

4.4 Infrastructure

Adequate infrastructure, including facilities, equipment, and information technology, is a necessity to realise an efficient standards system. In this section, we evaluate Uganda's standards activities to provide access to the infrastructure for all stakeholders, equipment, and information technology.

4.4.1 Standardisation: quality of physical infrastructure for standards

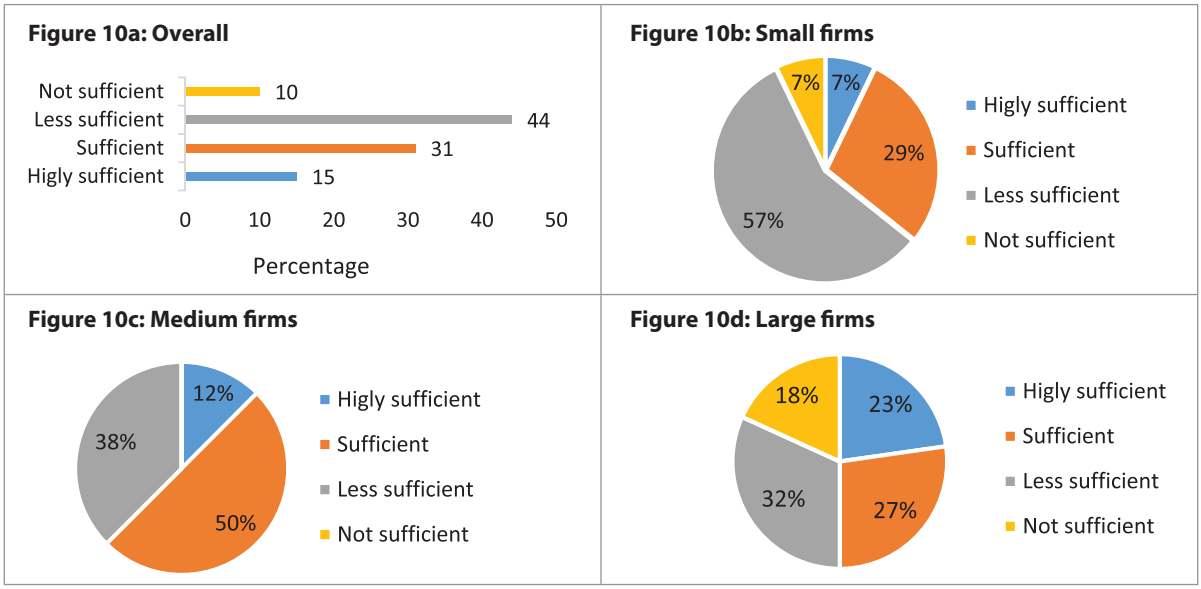
According to the NSCAF framework, infrastructure concerning standards includes laboratories and relevant equipment for testing and auditing products and the Information and Technology systems in place for the application of standards and internal systems management. In Uganda, infrastructure, particularly laboratories, are vital for the conformity assessment and metrology activities (industrial and legal). Both pillars are important for the consequent certification of products, which requires that laboratories and equipment are up to date and well maintained.

Interactions with key informers (MTIC and UNBS) revealed that the quality of the standards infrastructure stands between 45 - 75 percent. There is limited awareness, adoption and implementation of standards by the manufacturers. Further, we found that UNBS staff need more tools and the preliminary add-on tools for onsite inspection. This is important because certain products require ample time to pick and submit samples to the laboratory. Still, when UNBS reverts to the manufacturer, the products have been consumed or are out of stock. Therefore, it is important to have some rapid testing equipment to make immediate decisions to ensure that goods can be moved entirely from the shelves.

In addition, KIIs reveal that small firms do not have sufficient funds to access the laboratory facilities and rely on the funding allocated to UNBS, which cannot sufficiently assist all small manufacturers, negatively affecting their accessibility to the laboratories. Large firms are huge players in sectoral interest/association groups and conflict with UNBS on standards requirements.

Similarly, about 44 percent of all the sampled manufacturers indicated that the current physical quality infrastructure (considering accessibility by manufacturers to this infrastructure) was insufficient (Figure 10a). Across firm sizes, most of the small (57 percent) and large (32 percent) rate the adequacy of

Figure 10 Sufficiency of physical standards infrastructure



Source: Survey on standards (2021).

infrastructure as less sufficient (Figures 10b and 10c). Some manufacturers agree that UNBS does not have enough equipment to perform the necessary tests. For example, a small-sized lubricant manufacturing firm voiced that UNBS only possesses just one piece of equipment to test for viscosity. However, the process is long, given that the oil requires about one (1) hour for heating and cooling before testing. In short, testing time is bound by the adequacy of equipment and laboratories, which has implications for business activities' continuity.

4.4.2 Conformity Assessment: capacity of accredited laboratories to carry out product testing

Physical infrastructure under conformity assessment mainly deals with the testing laboratories and their capacity to carry out product testing, e.g. equipment and technology. UNBS operates several accredited national laboratories under its product testing infrastructure, including the National Metrology Laboratory; Chemistry; Electrical; Microbiology; Materials and Engineering. In addition, UNBS also recognises privately owned and public laboratories under the Laboratory Recognition Scheme to carry out product testing and fill the laboratory capacity gaps, such as Roofings Group, Steel Rolling Mills and Madhvani Group Limited, amongst others (UNBS, 2020b).

Regarding capacity to carry out product testing, KIIs revealed that the food safety laboratory that address microbiology and chemistry aspects, could be rated in the upper quartile (75th percentile and above) in terms of capacity but not in the 90th. The key informers revealed that this is because their lab has international accreditation and can conduct several tests for safety; aflatoxins, lead, or microbiological contamination in food; therefore, its results are acceptable worldwide. Whereas the food safety laboratory has the best testing infrastructure, other laboratories like engineering still have challenges.

We also noted through KIIs with UNBS that stakeholders have laboratories operated by both government and the private sector in terms of testing capacity. Notwithstanding, some manufacturers have laboratories which are not suitable. A few have the minimum capacity to do internal testing or qualify for the Inter-laboratory Comparison Scheme, which recognises laboratories with sufficient equipment to collaborate with UNBS.

Looking at this aspect from the manufacturer's perspective, Figure 11a shows that 39 percent of the sampled firms indicated that the current capacity

of product testing in accredited laboratories is less sufficient. At a firm level, 36 percent of the small (Figure 11b), 63 percent of the medium (Figure 11c), and 36 percent of the large firms (Figure 11d) stated that the current capacity is less sufficient. Further, a medium-sized food processing firm expressed that the food laboratory could not test all the parameters for food. Some manufacturers of petroleum products with fully equipped laboratories mentioned that they had applied for recognition as a private laboratory several times but were rejected by UNBS.

Most small and medium enterprises lack internal laboratories. This explains why most firms responded with 'less sufficient' because the capacity gaps are not properly filled, even with private sector investments. Chemiphar is one of the few major private laboratories operating since Uganda started exporting fish to Europe. That is a well-equipped laboratory and meets international standards. Therefore, private investment in laboratories is encouraged to fill infrastructure and capacity gaps and stimulate manufacturing through reduced costs. However, this is complicated given that Uganda lacks an accrediting body and has to rely on the South African National Accreditation System for its own government laboratory accreditation.

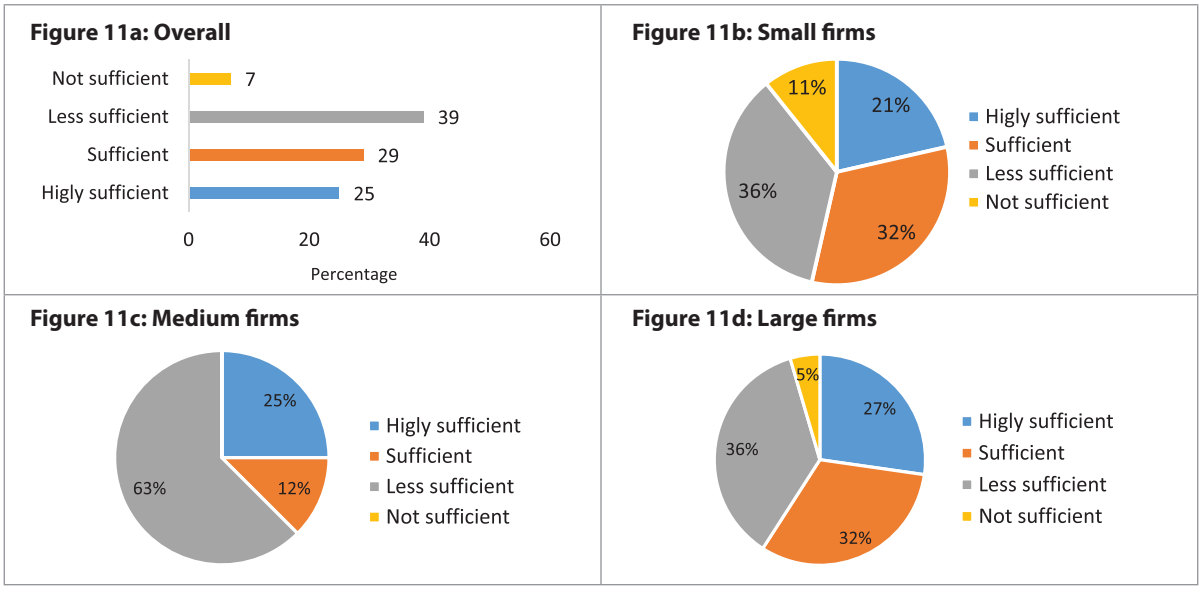
4.4.3 Metrology: recalibration and service of instruments

UNBS' Department of Legal Metrology has made efforts to verify weighing equipment, automatic and non-automatic such as *Minzani's,* used in shops under the Weights and Measurements division (UNBS, 2020a). Under the pre-packaged division, the Bureau ensures that the customers get the declared quantities on the package but also protects the manufacturers from packing more than is required. Other divisions include the volume and utilities division. Over the years, there has been improvement in the verification of measuring instruments, for example, each electric meter currently coming into the country is verified by UNBS.

The study sought the manufacturers' views regarding how frequently measuring instruments are recalibrated before each time they are put to use, how often laboratories are audited and their accreditation updated in five years (particularly legal metrology).

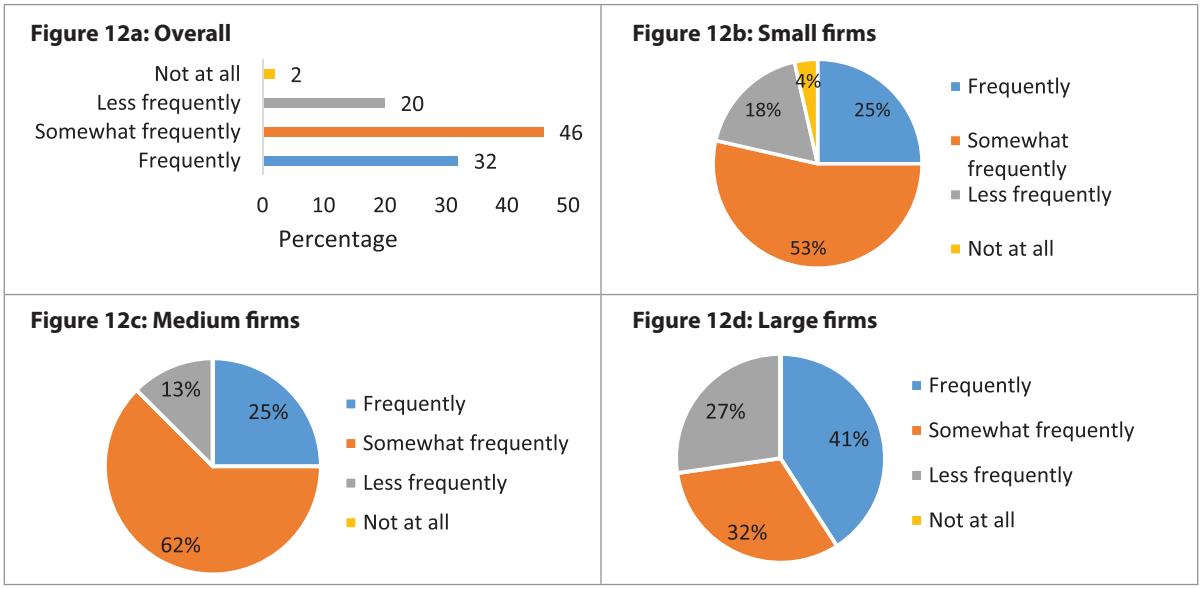
Figure 12a shows that most (46 percent) of the manufacturers indicate that measuring instrument recalibration and servicing was somewhat frequent. Across firm sizes, about 53 percent and 62 percent of small (Figure 12b) and medium (Figure 12c) firms said

Figure 11 Sufficiency of capacity for product testing



Source: Survey on standards (2021).

Figure 12 Frequency of measuring instruments recalibration and servicing



Source: Survey on standards (2021).

that measuring instruments were somewhat frequently recalibrated. On the other hand, 41 percent of the large firms indicated that recalibration was frequently done (Figure 12d). This is largely a positive outlook and shows UNBS National Metrology Laboratory's commitment to providing accurate tests that protect the consumers against being cheated when buying commodities and fostering credibility for locally manufactured products.

4.5 Human resources

In this section, we analyse Uganda's ability to recruit, manage and nurture human resources for national standards such as training, qualifications and competency (scale and level). In this process, an assessment of the human resources gaps is made to establish what can be done to improve the situation.

4.5.1 Standardisation: competence of the human resource in enforcing standardisation.

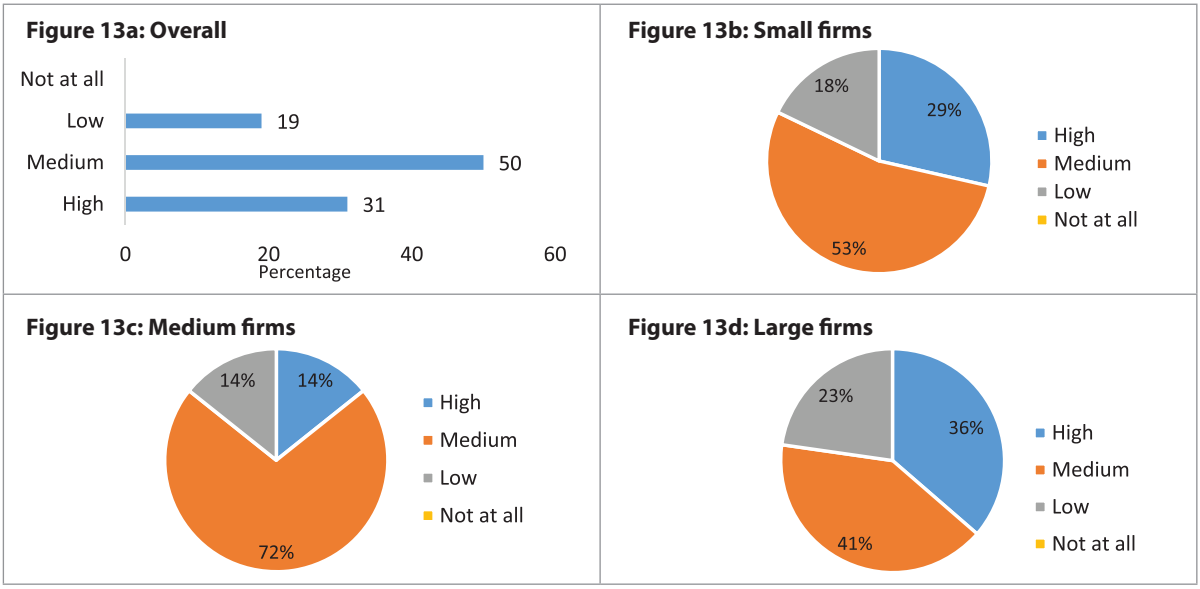
Under this category, emphasis is put on the state of deployment, qualifications, competency and management of the human resource enforcing the standardisation of products and services. The previous UNBS Strategic Plan (2015/16-2019/20) prioritised strengthening the human resource function to enhance certification services and inspection to guarantee product safety.

This study finds that the competency and capacity of UNBS, in terms of staffing, are still below the required level. For instance, of the 640 staff established positions in 2014, only 440 were filled, including field positions, by September 2021, representing about 69 percent[12]. Therefore, this leaves a lot of unfilled positions. In addition, the staff retention is very high, which has implications for training and recruitment costs.

Interactions with the manufacturers revealed that the competence of the human resources in enforcing standardisation, especially considering aspects such as qualifications, scale and level, and gaps in human resources, was medium at 50 percent compared to 31 percent and 19 percent that rated it high and low respectively (Figure 13a). Analysis by firm size also shows that most of sampled manufacturers think that UNBS' enforcement of standards is average. This is attributed to the long process of getting certification.

12 The surveillance, metrology and certification staff amount to 197; 27 staff under the surveillance function covering the whole country, yet to execute enforcement work competently, about 300 enforcement staff are required because the purpose of conducting inspections is to deny shelf to non-conforming products. This has prolonged the intervals of inspection (3-6 months) in given areas, which creates a reluctance to adhere to standards. However, an improvement in staffing can encourage conformity to standards and increase the competitiveness of local products. Nonetheless, some technical staff are highly qualified with post-graduate qualifications; where master's and post-graduate diploma holders are 131, degrees (244), 23 diplomas (these are mainly lab technicians), and 34 drivers with A-level qualifications.

Figure 13 Competence of UNBS Human Resources in enforcing standardization



Source: Survey on standards (2021).

Other manufacturers contend that UNBS is ineffective in fighting counterfeits and sub-standard commodities on the market, which has affected the profitability of their products. Others cite disagreements, for example, between UNBS and other government agencies, such as Uganda Coffee Development Authority, regarding mandates and moisture content for coffee.[13]

4.5.2 Conformity Assessment: regularity of training in the standards management system

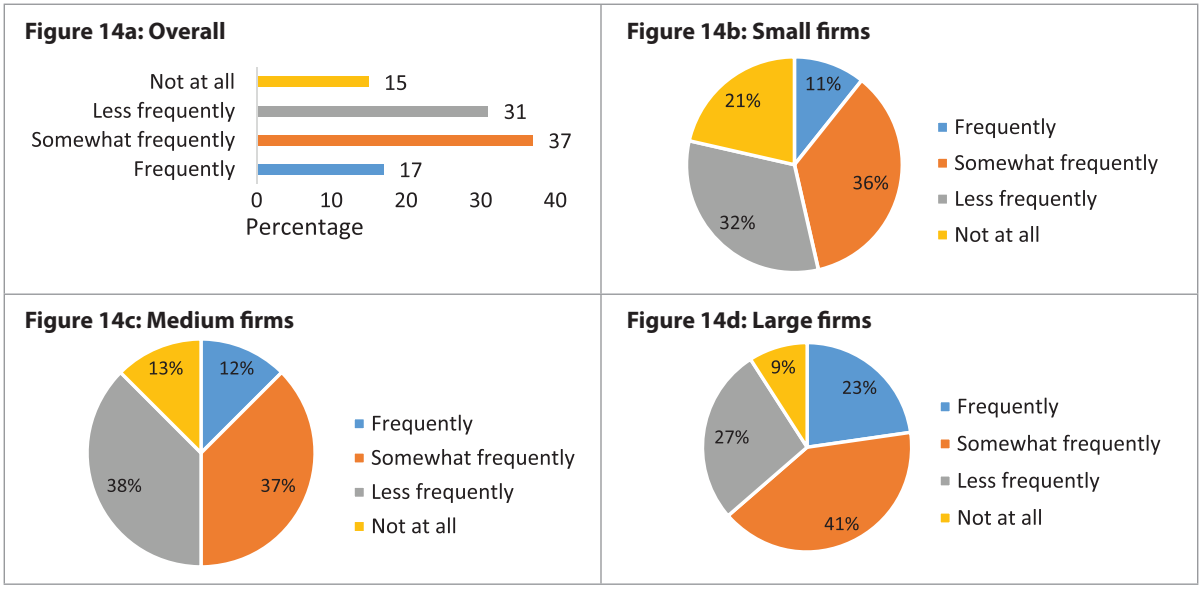
Despite the low number of staff, as previously mentioned, staffing levels have been growing gradually since 2014/15 (UNBS, 2020b). In 2018/19, UNBS had a total staff of 337 people – 65 percent were contract staff, 33 percent permanent, and 2 percent temporary (*ibid*). In addition, more staff are being trained through "pool training", and budgetary allocation to training was increased. To manage performance, the staff are appraised twice a year to assess their commitment to UNBS' mission and objectives. However, key activities such as surveillance remain grossly understaffed, which requires increased staff recruitment and training.

In harmony with this finding, KIIs also revealed that UNBS staff receive adequate training, whereby some staff are trained abroad (e.g. in India, Korea and South Africa) and these train others. Other trainings are done virtually, while a few staff attend physically because the budget is constrained. Because the technology keeps changing, staff require refresher trainings from time to time. There are modules staff have to undertake and are examined after training. Only those who pass get the authority card. Officials from UNBS also stated that UNBS had a training department at one point, but they merged this, leaving learning gaps in the Bureau. Therefore, they proposed that the training department be reinstated to close any training gaps within the Bureau, given that this is critical.

To assess the regularity of training in the standards management system conducted to adapt to emerging regional and international processes and procedures in the last five years, 37 percent of the manufacturers responded frequently, 31 percent less frequently, 17 percent frequently, and 15 percent less frequently (Figure 14a). Overall, there isn't very high confidence in the amount of training the staff receive to equip them with the right knowledge to handle emerging international and regional standards.

13 Note; the lack of awareness that fighting counterfeits is the core function of Uganda Registration Services Bureau, and UNBS intervenes if the commodities do not conform to standard specifications

Figure 14 Training in the Standards management system



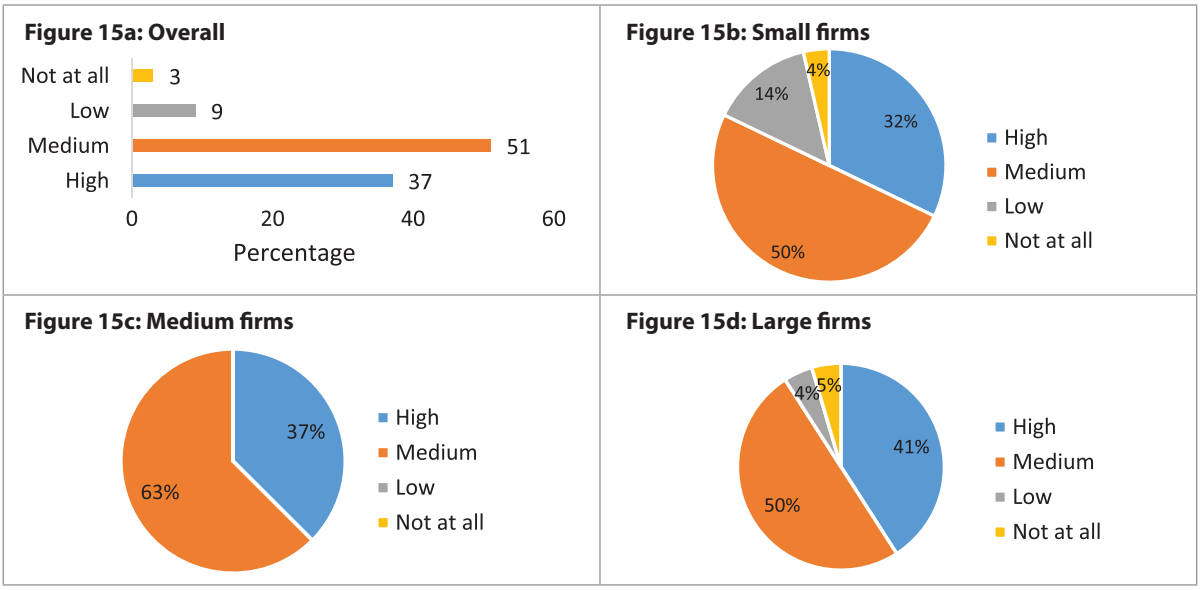
Source: Survey on standards (2021).

4.5.3 Metrology: qualification and motivation of human resources in metrology

The respondents indicated that UNBS only covers about 40 percent of what needs to be covered in totality under the mandate of the Bureau. Therefore, in terms of human resources, the Bureau is typically understaffed. For example, the Legal Metrology Department has about 59 staff, which are insufficient to meet the Bureau's mandate. The staff are also equipped with the necessary up-to-date equipment for undertaking metrology work, though more equipment is still required.

We also sought the views of the manufacturers in regards to how well-equipped the human resource is, with the necessary tools and knowledge to ensure correctness in measurements, taking into consideration the technical staff qualifications, certification and motivation. Most manufacturers, about 51 percent, indicated that UNBS staff are equipped with the necessary tools and knowledge to ensure correctness in measurements – giving them a rank of medium (Figure 15a). Across firm size, 50 percent or more in each sub-group responded with 'medium'. This shows

Figure 15 Equipment with the necessary tools and knowledge to ensure correctness in measurements



Source: Survey on standards (2021).

that most of the manufacturers have some confidence in the staff undertaking the metrology function. Some expressed having misunderstandings over scales and metres, and others suggested having internal personnel for recalibration as a better option, as opposed to depending on UNBS for that purpose.

4. 6 Process

Choi et al. (2014) posit that "the nation should establish and implement processes for effective and efficient operation of the standards system," particularly the processes for enforcing compliance, assessment and ensuing accuracy when conducting metrology activities, under the pillars as mentioned above.

4.6.1 Standardisation: process for the operation of the standards system

To improve standards, UNBS has established processes for operations, assessment and enforcement of standardisation. Under the NSCAF framework, this category assesses the effectiveness, efficiency, and existing gaps. The process is built around the Standardisation, Conformity Assessment, Metrology and Accreditation practices. Currently, UNBS enforces three (3) types of standards, which are national (Uganda standards [US]), regional (harmonised EAC standards [EAS]), and international standards (ISO).

Uganda currently has 3600 compulsory and voluntary standards, costing between Shs.10 000 to Shs. 50,000 may be updated or withdrawn with new product developments (UNBS, 2020a). The number of products and companies that are getting their products certified has also increased, with many exporting their products within the region.[14]

Like the abovementioned, KIIs pointed out that UNBS works closely with URSB to check whether the product meets the labelling requirements. When it comes to inspection, small and, micro firms are the most disadvantaged because when UNBS randomly attempts to pick samples for the laboratory and inspect the production process for quality assurance, the responsible managers are usually absent. Another challenge is that while the production site of a particular item is known, production in another will start without the knowledge of local authorities. Some manufacturers use this trick to open up, produce night and day, put the product on the market and close before authorities come.

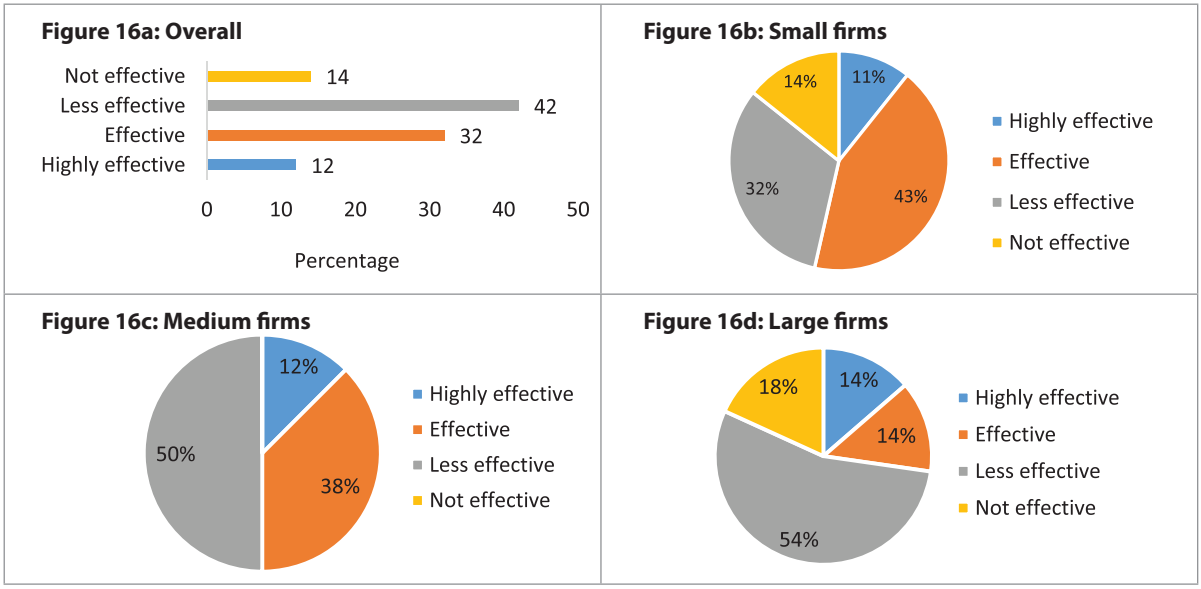
Lastly, there are challenges with market surveillance because of understaffing, which affects import inspection. For instance, out of the about 79 borders, UNBS staff are fully present at less than 20 border entry points. This suggests that products may come into the country without inspection at the other borders without UNBS presence, especially at the DRC border. Despite these gaps, UNBS relies on interactive and collaborative arrangements within the sector and Uganda Revenue Authority (URA) to identify the source of sub-standard products.

From the point of view of the manufacturers, however, to rate the effectiveness and efficiency of the processes for the operation of the standards system, such as identifying non-compliant manufacturers and punitive action taken, 42 percent responded with 'less effective', 32 percent effective, 14 percent 'not effective', and 12 percent 'highly effective' (Figure 16a). These responses suggest that confidence by the manufacturers in the processes that UNBS employs to enforce standards, mainly large and medium manufacturers, is low. As mentioned earlier, most firms complained that the Bureau was ineffective in identifying counterfeiters and punishing them. They were unaware that this is a core function of URSB since UNBS mainly handles sub-standard commodities.

Small firms complain of corruption in the certification process, while other manufacturers point out that enforcement tackles only registered companies, yet manufacturers of sub-standard goods remain unknown. Complaints from manufacturers are seldom addressed despite reports to the police and URA. According to them, this is where the laws and policies fail, and the punitive actions are not commensurate to elicit deterrence. In addition, litigation is not cost-effective, and prosecution of cases takes long, necessitating relying on internal processes and suspension of production.

14 UNBS set to open up more offices across Uganda (busiweek.com)

Figure 16 Effectiveness and efficiency of standards operation processes



Source: Survey on standards (2021).

4.6.2 Conformity Assessment: processes for assessment, auditing and certification

To achieve standardisation, they conduct conformity assessment under the Product Certification Scheme. This process involves testing/inspecting products to ensure conformity to required standards. This starts with registration with UNBS, after which a manufacturer applies for certification and pays for testing/auditing fees. The product samples are evaluated in accredited laboratories and, if certified, issued a Quality Mark (Q-mark) (UNBS, 2016a).[15]

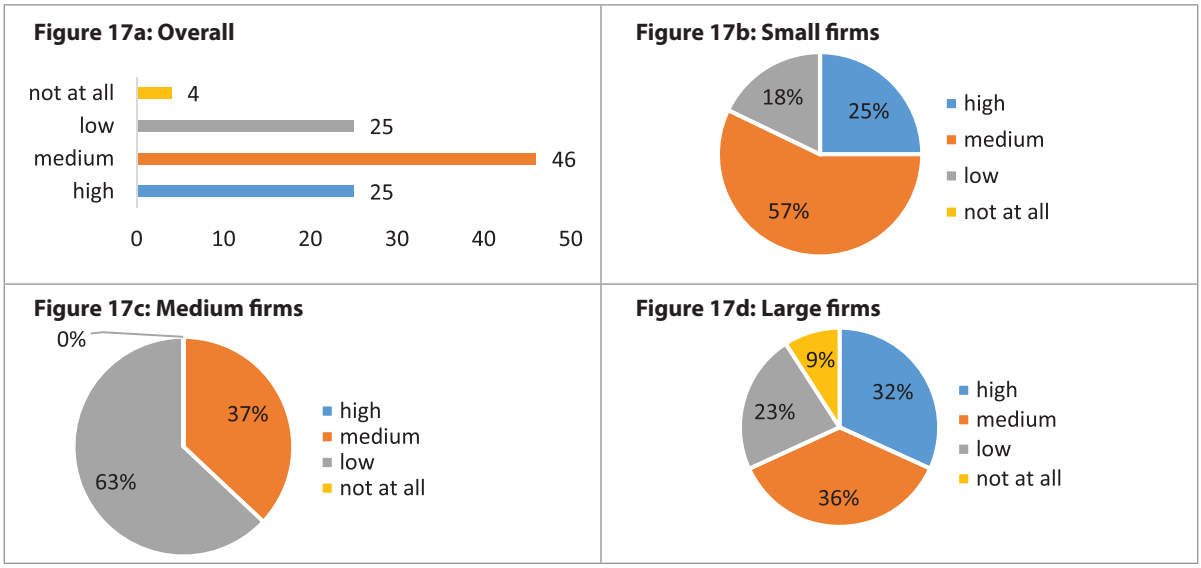
To ensure that products in the markets conform to stipulated standards, UNBS conducts regular surveillance of markets and factories. Two types of surveillance are employed, proactive and reactive market surveillance (UNBS, 2016b). Under proactive market surveillance, information is gathered from field reports and analysed. The results are then strategically used to plan and conduct surveillance regularly (*ibid*). Reactive surveillance usually entails unplanned, or surprise inspections and sample collections after UNBS receive tips or complaints from the public, media and customs about products that do not meet safety and quality standards. For non-conforming products and those deemed unsafe are removed from the market and banned. They put others on a list to create awareness among consumers about their lack of compliance.

Evidence from KIIs shows that UNBS has standard processes in place. However, the challenge for some stakeholders is when one or two items fail the conformity assessment test or contradict the standard in place or its interpretation. Issues arise because, as with any scientific process, there must be parameters that have to be fulfilled to get the certification. When the interpretation of the user/stakeholder differs from that of the standard board, this becomes a challenge and takes the process longer. Otherwise, the process is straightforward and very effective when the requirements are understood.

From the firm perspective on the processes for assessment and auditing, e.g., testing, verification, inspection and certification, which are proof that products meet the required standards, there was a widespread agreement that it is effective. 44 percent of the manufacturers said that UNBS was 'effective', 24 percent said they were 'highly effective, and 32 percent indicated that they were less or ineffective (Figure 17a). Most of the small and medium-sized firms perceived

15 Product certification/permit fees cost Shs. 500,000 for manufacturers for micro and small firms and Shs. 1,000,000 for medium and large firms. These permits are only valid for one year.

Figure 17 Effectiveness of processes for assessment and auditing



Source: Survey on standards (2021).

UNBS as 'effective', while most large firms were 'highly effective'.

Some manufacturers complained about the complexity of standards and the difficulty of understanding the requirements, suggesting a necessity for translation into local languages and simplifying standards. This challenge is prevalent among new entrants. For example, complaints registered in the water bottling sector reveal that the process is longer because it requires much more testing than what the existing company does. Depending on the previous compliance status of the firm in question, they can speed-up the process. This might explain why most large firms who have been in the system longer find the processes highly effective.

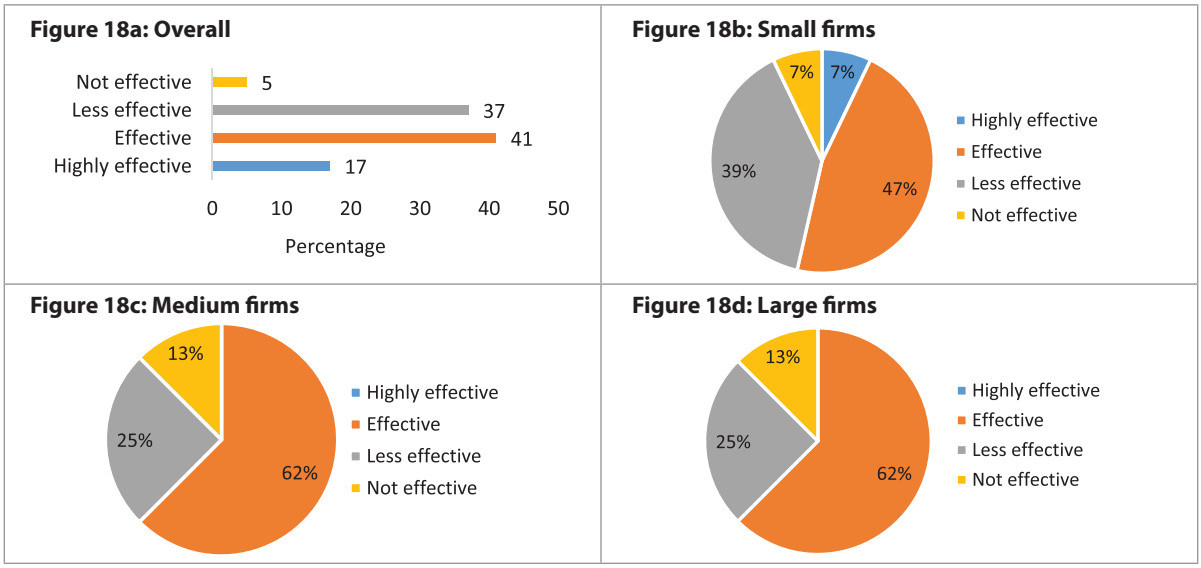
4.6.3 Metrology: process for identifying and rectifying errors in measurements

Concerning the process for identifying and rectifying measurement errors, local manufacturers have two requirements under the pre-package division – the label and the quantities. The National Metrology Laboratory is the custodian of the standards in terms of weights and ensures that if a manufacturer declares a commodity weighs one kilogram, it should be traceable to the same weight in the laboratory and aligns with standard weights.

The pre-package division has weights which have been calibrated against the national standards. The standard prescribes that it has to be plus or minus five based on the declared units. Samples are picked randomly from the manufacturing processing lines to measure the commodities' weights. If a manufacturer fails, they stop the line until the problem is rectified; if the manufacturer passes, they are issued a pre-packaged report. The declared weight or volume must be clearly stated on the product's label.

Regarding the effectiveness of the process for identifying and rectifying measurement errors to guarantee correctness in the metrological activities of manufacturers and traders, most manufacturers (about 41 percent) said that the Bureau was effective. At the same time, 37 indicated that they were less effective (Figure 18a). For the manufacturers that rate it as less or not effective, it is likely because they do not meet the legal metrology requirements for labels and quantities of pre-packed goods because of the use of depreciated weighing machinery or use of unverified equipment.

Figure 18 Effectiveness of the process for identifying and rectifying errors in measurements



Source: Survey on standards (2021).

5.0 CONCLUSION

The study aimed to assess Uganda's standards framework in pursuit of NDP III's Import Replacement strategy. Using desk reviews, key informant interviews and a survey of manufacturers, the study finds that significant efforts have been made to establish a strong legal and institutional framework for standards in Uganda. Whereas Uganda has the necessary legal, regulatory and infrastructural framework, several challenges exist in the design and implementation of standards, which need to be addressed to achieve the Import Replacement Strategy's objectives. We summarise the study's main findings according to standardisation, conformity assessment and metrology.

a) Standardisation

The study finds that efforts to review and/or reform the existing laws on standards are still weak. For instance, whereas the laws on standards are supposed to be reviewed every five (5) years, some laws and statutes have not been reviewed for more than five years. This is likely to affect the implementation of NDP III's import replacement strategy. In addition, inadequate funding for the Bureau constrains its ability to undertake activities, including enforcement, surveillance and inspection, and participate in international meetings. Further, it results in understaffing and inadequate equipment.

Other notable challenges include corruption in the enforcing institutions, whereby firms are asked to pay vast sums of money to process requirements for compliance besides what is documented. Also, manufacturers decried the selective enforcement of standards by targeting the registered and traceable companies while overlooking the unregistered – yet they sometimes produce substandard goods. Complaints from manufacturers are seldom addressed despite reports to police and URA.

b) Conformity Assessment

We find that conformity assessment provides a link between standards and the products. The limited awareness among the manufacturers and the policymakers about standards processes is the challenge of conformity assessment. Some respondents indicated that standards are complex and difficult to understand, thus limiting their conformity. In addition, there is information asymmetry about the changes in systems and regulations, constraining business activities because manufacturers are often caught off

guard.

At the institutional level, the study finds that understaffing limits UNBS' ability to undertake surveillance and inspection and enforce standards. Much as the few staff are equipped, the technology keeps changing, requiring refresher courses from time to time, but the budget limits this.

c) **Metrology**

UNBS only covers about 40 percent of its mandate as far as metrology activities are concerned. Much as the institution boasts of diversification in metrology, the department is typically understaffed and necessitates capacity building, such as using internal ICT systems for swift service provision to meet the mandate requirements. For example, under the weights and measurements, many instruments used in trade and pre-packing need to be verified vis-à-vis the advancement in technology, all of which require the Bureau's intervention.

Many firms still operate informally and do not under umbrella bodies like UMA or the Uganda Small Scale Industries Association (USSIA). This limits their access to information (more so the MSMEs) which is better disseminated through associations. In addition, it is difficult to obtain input from all stakeholders and find qualified people on the TCs who understand weights and measures requirements, and this negatively affects standards processes.

5.1 Policy Recommendations.

Regularly evaluate laws, regulations and policies to address gaps in implementing standards. The government needs to fast-track the review of outdated laws, regulations, and policies to address the current legal and policy challenges. This could consequently boost the effectiveness of firms in their operations and meeting of statutory obligations, especially start-ups and SMEs. It will also promote producing quality goods and services that meet current domestic and international standards. However, the government needs to develop a sound communication strategy to communicate any changes in the laws, regulations and policies so that they leave behind no manufacturer.

Manufacturers should be consistently and deliberately informed and consulted about the standards. There is an urgent need to understand what the manufacturers need and how they can be supported to adhere to standards. This can be through leveraging traditional and non-traditional media to create awareness to help them understand what standards are, the procedures regarding conformity assessment and to make standards infrastructure easily accessible to improve compliance. MSMEs should also be encouraged to join manufacturer associations and networks, to easily access information and other advantages that accrue to association membership.

Increase training and staffing for UNBS to address human resource gaps. This will enable it to fully execute its mandate – by implementing the different policies and laws. However, this requires adequate funding (budget support) to UNBS to cater to the training needs of the staff and also increase the number of staff from 440 staff to about 1000. This also requires that the training budget be increased by 10 percent. Also, the government could revive the training department at UNBS to provide training to staff and non-staff. To ensure staff retention, the staff need to be well remunerated and incentivised to undertake their work effectively and efficiently.

Empower the local authorities to support UNBS in enforcing standards. UNBS needs to invest in educating the lower local government authorities about standardisation and the related processes so that they can detect violations in product standards and report the culprits. UNBS can leverage the local authorities with more presence on the ground who might be quicker in detecting unscrupulous players and entities that begin production without formal approval. A failure to empower the local authorities might undermine efforts to enforce standards.

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ANNEX

Table A1

Table A 1: Likert scale 1-4 across the pillars and categories

CATEGORY		PILLARS		
		Standards	Conformity Assessment	Metrology
		Scale key (1-4)*		
Laws, systems and Institutions	1	Frequently	high	Highly Effective
	2	Somewhat Frequently	Medium	Effective
	3	Less frequently	Low	Less effective
	4	Not at all	Not at all	Not effective
Strategies and Implementation plans	**1**	high	Highly Effective	Highly Effective
	2	Medium	Effective	Effective
	3	Low	Less effective	Less effective
	3	Not at all	Not effective	Not effective
Stakeholders	**1**	Highly sufficient	Frequently	Frequently
	2	sufficient	Somewhat Frequently	Somewhat Frequently
	3	Less sufficient	Less frequently	Less frequently
	4	Not sufficient	Not at all	Not at all
Infrastructure	**1**	Highly sufficient	Highly sufficient	Frequently
	2	sufficient	sufficient	Somewhat Frequently
	3	Less sufficient	Less sufficient	Less frequently
	4	Not sufficient	Not sufficient	Not at all
Human resources	**1**	high	Frequently	high
	2	Medium	Somewhat Frequently	Medium
	3	Low	Less frequently	Low
	4	Not at all	Not at all	Not at all
Process	**1**	high	Frequently	Highly Effective
	2	Medium	Somewhat Frequently	Effective
	3	Low	Less frequently	Less effective
	4	Not at all	Not at all	Not effective
* 1 being the highest and 4 the lowest				

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