ASSESSMENT OF STANDARDIZATION, WEIGHTS AND MEASURES AND THEIR IMPLICATIONS IN TRANSACTION COSTS IN THE AGRICULTURAL VALUE CHAINS

Final Report

FEBRUARY 2012
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<thead>
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<th>Description</th>
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<tbody>
<tr>
<td>ASLM</td>
<td>Agricultural Sector Lead Ministries</td>
</tr>
<tr>
<td>AVC</td>
<td>Agricultural Value Chain</td>
</tr>
<tr>
<td>BoT</td>
<td>Bank of Tanzania</td>
</tr>
<tr>
<td>COPB</td>
<td>Cereals and Other Produce Board of Tanzania</td>
</tr>
<tr>
<td>MAFC</td>
<td>Ministry of Agriculture, Food Security and Cooperative</td>
</tr>
<tr>
<td>MIT</td>
<td>Ministry of Industry and Trade</td>
</tr>
<tr>
<td>MoHSW</td>
<td>Ministry of Health and Social Welfare</td>
</tr>
<tr>
<td>NBS</td>
<td>National Bureau of Statistics</td>
</tr>
<tr>
<td>PMO-RALG</td>
<td>Prime Minister's Office, Regional Administration and Local Government</td>
</tr>
<tr>
<td>RLDC</td>
<td>Rural Livelihood Development Company</td>
</tr>
<tr>
<td>TBS</td>
<td>Tanzania Bureau of Standards</td>
</tr>
<tr>
<td>TFDA</td>
<td>Tanzania Food and Drugs Authority</td>
</tr>
<tr>
<td>URT</td>
<td>United Republic of Tanzania</td>
</tr>
<tr>
<td>WMA</td>
<td>Weight and Measure Agency</td>
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Executive summary

In the globalized marketplace, a key challenge facing developing countries is a lack of national capacity to overcome technical barriers to trade and among them is poor practice in standardization, weights and measures. To far extent, this does not only affect the international trade, but also the local market for all products. However, to a far extent, the agricultural products are more affected by poor practice in standardization, weights and measures than other sectors such as manufacturing, mining or construction.

One of the most challenging policy areas is the issue of standards, weights and measures as understood by the farmers, traders and other implementing actors in Tanzania marketing system. Against this background, RLDC has commissioned this study with the objective of finding out the practices and issues related to standards, weights and measures and propose interventions to correct and improve market efficiency in the country. For this specific assignment, the consultant was required to undertake the assessment in regards to utilization of standards, weights and measures and their implications in transaction costs in agricultural value chains and overall market systems.

It was found that few smallholder farmers and traders are aware of standards and issues related to weights and measures in legislation or regulations. Various reports have cited lack of public awareness and monitoring as major hindrances in market efficiency and fair trading in agricultural crops. Awareness is a function of knowledge and level of understanding of market mechanisms and use of information systems to ensure fair deal in crops marketing. Both institutions and agricultural actors have joint responsibility for creating and adopting awareness. In developing countries like Tanzania, Government institutions have high role in creating awareness to the public especially smallholder farmers in rural areas. Farmers should well be informed and trained on the use of proper measuring instruments for their produce.

Given the large discrepancies found in many studies, including this one, it would be in farmer’s interest to ensure that bags/sacks are weighed to get market price based on weight rather than in volume. However, due to resources constraints, most smallholder farmers cannot afford to possess weighing scales, hence the need for forming groups or associations. In addition, it advisable to farmers to sell their produce at collection centres and also becoming part of the Warehouse Receipts Systems in their location is important to improve their gains from the produce.

The terms of reference requires the study team to evaluate and document the challenges, benefits and opportunities of enforcement of the existing standards. The challenges for enforcing the existing standards include the following:

- Standards written in English Language not easily known by smallholder farmers and traders
- Lack of weighing scales at village and farms level
- Affordability of weighing scales to smallholder farmers
- Weak Institutions result in low level of enforcement
- Lack of formal collaboration among institutions
- Low level of awareness among actors, especially smallholder farmers
- Corruption syndrome.

The benefits for enforcing the existing standards include the following:

- Improve smallholder farmers’ margins
- Regulate pricing mechanism in local markets
• Improve quality of agricultural products in local markets
• Raise credibility of local markets to buyers and consumers
• Improve revenue generation through the value chain
• Improve health of porters
• Road infrastructure durability
• Decrease number of overload accidents.

The opportunities for enforcing the existing standards include the following:
• Standards exist conform to international requirements
• National laws and regulations exist
• Recently prepared agricultural marketing policy and its operational strategy
• Responsible institutions exist with presence at least at regional level
• Development programmes exist to support institutions e.g. ASDP, PSRP etc.

The main findings of this study can be summarised as follow:
• Adherence to quality and standards mostly depends on the cost-benefit as well as incentives resulted from the local and international markets in form of price differentials. Generally, the agricultural production in the country has been characterised by poor adherence to product standards and grades due to lack of adequate compensation from traders in local markets. Most of the cereal crops are produced and consumed locally with no incentive to achieve high standards or quality.

• Establishment of the Cereals and Other Produce Board of Tanzania is considered a key step in achieving high standards and quality in future. However, challenges remain in the form of adequate resources whereby many institutions in the country lack capacity to deliver required services as prescribed in their respective Acts.

• Cost implications including crop cess, market fees and transport charge create incentives for traders and intermediaries to over-load the packing beyond standard weights. This is the policy issue in which the Prime Minister’s Office, Regional Administration and Local Government (PMO- RALG) have to review and make changes. The district councils and villages should charge crops cess on standard measurement e.g. per kg or ton.

• In some cases it was reported that WMA charges high fees for certifying the weighing scales on inspections. WMA in collaboration with MIT should review the tariffs and explore the cost-benefit-analysis of ensuring that many farmers through villages, groups and association have more accurate measurement instruments which are affordable.

• Self-regulatory mechanism for the use of standards, weights and measures does not exist. The farmers associations and groups are not well provided with capacity to regulate the market in their favour. For example, lack of guidelines, regulations and standards in Kiswahili language to the farmers’ level is hindrance to gaining fair competition in the local markets.

• Poor infrastructure limits the ability of small farmers to participate directly in cities and national markets, hence reducing transaction cost and increase agricultural produce profitability. It was found that most of the farmers sell their produce to a number of intermediary traders, who take advantage on transport cost, illegal measures on weights and market information
Knowledge deficit on small farmers is a major constraint to reduce transaction cost and bargain economic price for cereal grains market in the country. For not using accurate measuring instruments alone create significant margin of loss to farmers estimated to be above 40% of the annual sales.

Absence of farmers' groups or association leads to high transaction costs for each farmer and therefore making it not as profitable to participate in the value chain. There is a need for farmers to organise themselves into groups or association and be able to own and access weighing scales and increase their bargaining power for prices in the markets.

Lack of modern markets in some areas also limits the small scale farmers from reducing transaction cost during selling their produce. For example, it was found that most of the small farmers in Mbarali sold their produce through their village markets which are not organised and without adequate market information on prices and demand in other places.

Existence of laws and regulations alone is not adequate to effectively implement a fair and efficient trade and marketing system in the country. Public education, knowledge, awareness and legal enforcement are very important factors. This is an area where RLDC can support through its development programmes in rural areas.
SECTION 1  INTRODUCTION

This assessment report presents the result of the work undertaken by the INNOVEX Development Consulting Limited after being contracted by the Rural Livelihood Development Company (RLDC). The assignment was on assessment of utilization of standards, weights and measures and their implications in transaction costs in the agricultural value chains. The final report is issued following completion work as per the contract and Terms of Reference.

This first section highlights the background to the study and scope of the assignment. The remaining part of the report is structured under the following major headings:

- Section 2 – Regulatory framework
- Section 3 - Awareness of agricultural actors
- Section 4 – Rapid assessment
- Section 5 – Practise on standards, weights and measures
- Section 6 – Key findings and recommendations
- Section 7 - Annexes.

1.1 Background

The Tanzanian economy depends heavily on agriculture, which accounts for more than 25% of GDP, provides 85% of exports, and employs 80% of the work force. Despite declining trend in GDP contribution, the agriculture sector has been identified as a growth driver of the economy. Table 1.1 shows composition of the three sectors in GDP between 2005 and 2009.

<table>
<thead>
<tr>
<th>Sector</th>
<th>2005</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>27.6%</td>
<td>25%</td>
</tr>
<tr>
<td>Industry &amp; Construction</td>
<td>20.8%</td>
<td>20.8%</td>
</tr>
<tr>
<td>Services</td>
<td>42.5%</td>
<td>45%</td>
</tr>
</tbody>
</table>


Tanzanian agriculture is dominated by small-scale subsistence farming as indicated by the farming method (Table 1.2). Like the entire economy, agriculture is in a transition from being a command to a market-based production system. The transition process started in the mid-1980s as part of the economic adjustment and structural reform programs and policies supported by Tanzania’s development partners. Despite some impressive macroeconomic achievements resulting from the reform programs, agricultural growth and rural poverty reduction continue to present daunting challenges. Few smallholder producers understand how markets work, and even if they do, they do not have the information they need to participate effectively.

<table>
<thead>
<tr>
<th>Farming method</th>
<th>% Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand hoe</td>
<td>70%</td>
</tr>
<tr>
<td>Ox-plough</td>
<td>20%</td>
</tr>
<tr>
<td>Tractors</td>
<td>10%</td>
</tr>
</tbody>
</table>

Source: MKUKUTA II (July 2010)
In the globalized marketplace, a key challenge facing developing countries is a lack of national capacity to overcome technical barriers to trade and among them is poor practice in standardization, weights and measures. To far extent this not only affects the international trade but also the local market for all products. However, to a far extent, the agricultural products are more affected by poor practice in standardization, weights and measures than other sectors such as manufacturing, mining or construction.

The Terms of Reference was very specific in terms of agricultural products for the study, which are food cereals. By definition: “cereals, grains, or cereal grains are grasses (members of the monocot families Poaceae or Gramineae) cultivated for the edible components of their fruit seeds (botanically, a type of fruit called a caryopsis): the endosperm, germ, and bran. Cereal grains are grown in greater quantities and provide more food energy worldwide than any other type of crop; they are therefore staple crops. The most common crops falling under cereal products include: maize; paddy/rice; wheat; barley; sorghum; and millet.

In almost every country and region, cereals provide the staple food. In the world as a whole, only 5% of starchy staple food comes from tubers (mainly cassava, potato, and yams, depending on climate), whereas the rest is from cereal. Cereal grains contain 60% to 70% starch and are excellent energy rich foods for human consumption. In developing countries, people may eat more than 500 g of cereal per day, which provide most of their protein needs (and more than 50% of their total daily energy requirement). Therefore, being staple food in many countries, cereal crops are widely and intensively cultivated, processed, distributed and consumed in the world. The value chain process is complex and market dynamics plays major role in providing incentive or disincentive to small farmers in production process. Among factors which play major part in the value chains are standards, weights and measures in the marketing process.

1.2 Objective and scope of the study

One of the most challenging policy areas is the issue of standards, weights and measures as understood by the farmers, traders and other implementing actors in Tanzania marketing system. Against this background, RLDC has commissioned this study with the objective of finding out the practices and issues related to standards, weights and measures and propose interventions to correct and improve market efficiency in the country. For this specific assignment, the consultant was required to undertake the assessment in regards to utilization of standards, weights and measures and their implications in transaction costs in agricultural value chains and overall market systems.

Specific activities to be undertaken in this study include:

- Undertake literature review and document the agricultural products (cereals) standards and weights and measures
- Assess the level of awareness on the existing standards and weights and measures (In consultations with the agricultural actors along the cereals value chain
- Evaluate and document the challenges, benefits and opportunities of enforcement of the existing standards
- Tabulate the margin of losses or gains based on the use of standards of measure for a small holder agricultural producer
- Undertake a rapid assessment on the grain in at least two markets of Kongwa and Mbeya to determine the percentage that meets quality standards as defined by the existing regulations
- Generate a synthesis of credible evidence to demonstrate the positive impact to the smallholder farmers when standards are used
- Stipulate what measures need to be taken by the Weights and Measures Agency, Tanzania Bureau of Standards, and Tanzania Food and Drugs Authority on how to ensure voluntary compliance and adherence to the standards, weights and measures by all the actors including farmers and traders
• Make recommendations based on evidence on the potential impacts of alternative policy options
• Prepare and make a presentation (power point) to stakeholders on the study findings and its conclusions.
1.3 Concept and definitions

What is value chain? According to Kaplinsky and Morris (2002: p2), a value chain is “the full range of activities involved in getting a product or service from conception, through the different phases of production and delivery to the final consumer”. Therefore, value chains including that of agricultural products consist of different actors at each stage of production where value is added. This is the definition adopted in this study in the context of assessing standardization, weights and measures and their impacts to the value chains.

Agricultural value chains have increasingly become complex over time. Market requirements rapidly change driven by increasing demand, changing lifestyles and government policies. In response to these changing market requirements, value chains have become more coordinated leading to more integration and concentration to achieve efficiency and minimize risks. Product and market standards change which in turn, require changes from various actors in the chain that supply these products including their inputs to meet market requirements. A critical input in the business of creating value in these changing agricultural chains is market efficiency in terms of fair trade through standards, weights and measures. Ensuring that standards, weights and measures provide smooth flow of exchange is vital to any economy and its growth.

Agricultural marketing and processing refer to the activities involved in taking a product from the farm gate and delivering it in the form, at the time, and to the place that the buyer requires. Therefore, costs are incurred through handling, transport, storage, processing, packaging, market fees, risk management, brokerage, export handling and others. There are broad and narrow definitions of “transaction costs”. According to neoclassical economics and more recently, new institutional economics, transaction costs relate to the non-price costs of making a commercial exchange.

The broad definition by Staal, Delgado and Nicholson (1997) classify transaction costs into observable and unobservable transaction costs. The observable transaction costs include marketing costs such as transport, handling, packaging, storage, spoilage etc. that are visible when a transaction takes place. Unobservable transaction costs include cost of information search, bargaining, and enforcement of contracts. This broad definition of transaction cost is favoured and adopted in this study.

Figure 1.1: Grains Marketing Chain (General Flow)
1.4  Data Sources

Primary data:

This study collected primary data from various sources using three collection methods: in-depth interviews; face-to-face interviews (questionnaires); and rapid testing of packed agricultural products in trade markets of Kibaigwa (Kongwa) and Mbarali (Mbeya).

- **In-depth interviews:** Study team carried out in-depth interviews with a number of officials from key stakeholder institutions. The detailed list of key stakeholder contacted and interviewed during the study is provided in Annex A to this report.

- **Questionnaires:** Study team carried out face-to-face interviews using pre-designed questionnaires to a sample of selected respondents from three categories involved with agricultural products (grains) value chains. The categories are grain small-traders, grain farmers and grain transporters. We used random sampling to select target respondents in two districts Kongwa (Dodoma) and Mbarali (Mbeya). The sample target and response is summarised in Tables 1.3 to 1.5 below:

  **Table 1.3:** Sample size and response to Small Traders Questionnaire

<table>
<thead>
<tr>
<th></th>
<th>Target size</th>
<th>Actual Response</th>
<th>% Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kongwa District</td>
<td>50</td>
<td>47</td>
<td>94%</td>
</tr>
<tr>
<td>Mbarali District</td>
<td>50</td>
<td>53</td>
<td>106%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

  **Table 1.4:** Sample size and response to Grain Farmers Questionnaire

<table>
<thead>
<tr>
<th></th>
<th>Target size</th>
<th>Actual Response</th>
<th>% Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kongwa District</td>
<td>50</td>
<td>50</td>
<td>100%</td>
</tr>
<tr>
<td>Mbarali District</td>
<td>50</td>
<td>50</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

  **Table 1.5:** Sample size and response to Transporters Questionnaire

<table>
<thead>
<tr>
<th></th>
<th>Target size</th>
<th>Actual Response</th>
<th>% Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kongwa District</td>
<td>30</td>
<td>32</td>
<td>107%</td>
</tr>
<tr>
<td>Mbarali District</td>
<td>30</td>
<td>29</td>
<td>97%</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>61</td>
<td>102%</td>
</tr>
</tbody>
</table>

- **Rapid Testing:** We carried out a random rapid testing of weights, measures and standards on a sample of selected small grains traders in markets visited in Kongwa and Mbarali. The purpose of the rapid testing was to obtain evidence on physical measurement and be able to compare with standards. Summary of testing sample size is provided in Table 1.6 below:
Secondary data:

We used in some cases secondary data from various sources especially the Ministry of Agriculture Food Security and Cooperative (MAFC), Ministry of Industry and Trade (MIT), Bank of Tanzania (BoT), the National Bureau of Statistics (NBS), Tanzania Bureau of Standards (TBS), Weights and Measures Agency (WMA) and Tanzania Food and Drugs Authority (TFDA).

1.5 Respondents

This sub-section provides profile of respondents in face-to-face interviews and questionnaires analysed. There were three study questionnaires conducted using face-to-face interviews with randomly selected respondents. The three study questionnaires were for three categories of respondents, namely:

- Small scale traders
- Small scale farmers
- Transporters.

1.5.1 Small scale traders

In this study, a total of 100 small scale traders were interviewed, 50 each from Kibaigwa and Mbarali markets. Kibaigwa was one large market, while in Mbarali District four small markets were covered. The small markets in Mbarali District include Rujewa, Ubaruku, Chimala and Igulusi. Kibaigwa market was mainly trading in maize and dominated by male (91.5%), while in Mbarali markets the main trading cereal was paddy (including rice) was dominated by the female small traders (52.8%). Most of the small traders were trading in those markets for more than three years (78%), while those with less than one year were only 4% of the interviewees.

<table>
<thead>
<tr>
<th>Table 1.6: Sample size of rapid tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight test</td>
</tr>
<tr>
<td>Paddy</td>
</tr>
<tr>
<td>Rice</td>
</tr>
<tr>
<td>Maize</td>
</tr>
</tbody>
</table>

Figure 1.2: Gender profile of small traders in two markets

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kibaigwa</td>
<td>91.5%</td>
<td>8.5%</td>
</tr>
<tr>
<td>Mbarali</td>
<td>47.2%</td>
<td>52.8%</td>
</tr>
</tbody>
</table>
1.5.2 Small scale farmers

Total of 100 cereal farmers were interviewed in various locations in Kibaigwa and Mbarali markets. In terms of gender, there were 80% male farmers and 20% female farmers who responded in our face-to-face interviews. In Kibaigwa most of the respondents were male (96%), while in Mbarali male were 64%. Similar to their respective markets crops mix, small farmers in Mbarali were exclusively farming paddy, and while in Kibaigwa were farming maize.

1.5.3 Transporters

A total of 61 transporters were interviewed in Kibaigwa and Mbarali during this study. The transporters were from different companies and owners as described by profile of their main office locations. The transporters were randomly selected from truck drivers who were found around the markets where study was conducted. Out of the 61 transporters, 52.5% were from Kibaigwa, while 47.5% were from various markets in Mbarali district. The average vehicle load capacity was 15 tons, while minimum and maximum capacity was 10 and 30 respectively. Generally, the trucks which were found in the study market areas were of large size and intended for long route, especially to Dar es Salaam markets.
SECTION 2  REGULATORY FRAMEWORK

In this section we present analytical review of regulatory framework in relation to setting and enforcing standards, weights and measures in Tanzania. The reference is made specifically to the cereal crops, which are the subject of the study in relation to transaction costs in the agricultural value chain (AVC). The remaining part of this section is presented under the following headings:

- Institutions
- Policies
- Legislations.

2.1  Institutions

The regulatory framework in Tanzania is vested in three institutions, each enforcing unique laws that govern efficient market exchange of agricultural products. The three institutions are: Tanzania Bureau of Standards (TBS); Weights and Measures Agency (WMA); and Tanzania Food and Drugs Authority (TFDA). The three institutions have different roles in fulfilling their functions as per their respective laws. However, the institutions worked in collaboration in areas such as standards setting. The inter-relationship and role of each institution in relation to marketing system of the agricultural grains is depicted in Figure 2.1 below. The three institutions belong to different ministries i.e. TBS and WMA from Ministry of Industry and Trade (MIT), while TFDA from Ministry of Health and Social Welfare (MoHSW).

Figure 2.1: Institutional regulatory framework

![Diagram of Institutional Regulatory Framework]
The three institutions did collaborate informally as reported by the WMA officials. However, the Acts have indicated the need for cooperation and collaboration among the various institutions in order to increase capacity in service delivery as well as extending services though other institutions to areas not presence. For example, WMA and TFDA are members of committees formed by TBS are setting the standards. Also S.5 (2) of the Act No 1 of 2003, requires TFDA to consult and collaborate with TBS and any other institutions established by laws in the country. At operational level, both institutions would benefit if they create an effective collaboration mechanism with the local councils to deliver their services, while executing their duties. However, due to limitation in resources collaboration are not formalised and much of function relation depends on consultative among the institutions.
2.1.1 Tanzania Bureau of Standards

The Tanzania Bureau of Standards (TBS) was established by an Act of Parliament number 3 of 1975, which was revised by the Standard Act No 2 of 2009. The Standard Act No 2 of 2009, provide for promotion of standardization of specifications and also repeal the Standards Act, Cap 130. The President of Tanzania assented by signing the new Standard Act on 12th March 2009.

Tanzania Bureau of Standards (TBS) was established under the Ministry of Industry and Trade by an Act of Parliament, The Standards Act No3 of 1975 as the National Standards Institute and became operational in April 1976. The Bureau was established as part of the efforts by the government to strengthen the supporting institutional infrastructure for the industry and commercial sectors of the economy. Specifically, TBS was mandated to undertake measures for quality control of products of all descriptions and promote standardization in industry and commerce. It was subsequently renamed Tanzania Bureau of Standards through an amendment to the Act by Act No1 of 1977. The main function of TBS is formulation, promotion and implementation of National Standards in the fields of agriculture and food, chemicals, textiles, leather, environment, engineering and service industry.

Therefore, in relation to this study, TBS is one of the key stakeholders and directly involved in ensuring that standardization and quality of food grains throughout the market value chains are enforced to ensure fair and efficient marketing system. TBS is collaborating with other institutions in setting the national standards and act as secretariat to support the specific sector in developing relevant standards including for agricultural products. The process of setting the standards is depicted in Figure 2.2 below; according to TBS officials it takes a minimum of 18 months to complete a set of standard. The grains standards were prepared by the Agriculture and Food Divisional Standards Committee under supervision of TBS. The draft work from the Technical Committee is submitted to the Divisional Committee, where public as well as regional standard boards provide their feedback and comments. The amended standards by the Divisional Committee are submitted to the Executive Board for reviewing and forwarding to the Permanent Secretary for final approval. The list of relevant standards for this study is documented in Annex B.

Figure 2.2: Process of setting national standards
2.1.2 Weights and Measures Agency

Weights and Measures Agency (WMA) is an Executive Agency responsible for fair trade transactions through certification of Weights and Measures. Its establishment started in 1999 in pursuance to the Executive Agencies Act Number 30 of 1997 to replace the former Directorate of Weights and Measures under the Ministry of Industry and Trade. The move was part of the then Public Service Reform Programme (PSRP) to improve efficiency and effectiveness of public service delivery.

The Agency is under a Chief Executive as the Commissioner. In order to make services reachable to their customers; WMA have Regional Offices in all the Regions in Tanzania. WMA is dedicated to protecting consumers, businesses and manufactures from unfair practice through the application of accurate Weights and Measures. It endeavours to ensure optimum uses of resources and fair trade transactions between investors, producers, transporters and consumers with consumer protection emphasis.

Many reports have cited inadequate and weak regulatory framework in enforcing grades, standards and quality of agricultural products in Tanzania. Since its establishment, WMA is slowly improving its performance though not at a pace that the stakeholders are demanding. Being an executive agency, which partially depend on the Government subsidy\(^1\), the operations is constrained by inadequate resources in both human and capital. The number of staff has increased from 129 (2002/03) to 199 (2010/11). The available staffs (199) are not capable to cover Head Office, 24 regions and 134 district councils in the country in addition to large number of markets and other functional areas within their jurisdiction. Based on assessment done in 2005, the actual staff requirement was 750. Therefore, it would seem that WMA is constrained to perform effectively due to inadequate number of staff to serve in all regions, districts and go down to the markets or collection posts in rural areas. Apart from staff, WMA is also faced with inadequate transport facilities, training, equipments and even office space. Currently, WMA Headquarters is hosted in a rented small office at Ilala Boma and the situation in regional or district offices is not documented but is said to be inadequate. Generally there is large inadequacy of resources when compared the actual versus required budget.

2.1.3 Tanzania Food and Drugs Authority

Tanzania Food and Drugs Authority (TFDA) is a regulatory body responsible for controlling the quality, safety and effectiveness of food, drugs, herbal drugs, cosmetics and medical devices. TFDA was established under Section 4(1) of the Tanzania Food, Drugs and Cosmetics Act No 1 of 2003, after repealing the pharmaceuticals and poisons Act No 9 and Food (Control of Quality) Act No 10 both of 1978 (which established the National Food Control Commission). TFDA, a semi-autonomous body under the Ministry of Health and Social Welfare, became operational on 1st July 2003. The mission of TFDA is to protect the health of consumers against hazards associated with food, drugs, herbal drugs, cosmetics and medical devices.

Agricultural products falling under food, with role on quality and safety as core function, TFDA is another key stakeholder in this study. Section 5 of the Act No 1 of 2003 gives mandate to TFDA to regulate food and by the Act definition is not limited to processed food. However, the TFDA due to resources limitation it has been focusing on manufactured food in agro-processing industries. With all constraints faced by similar regulatory institutions, TFDA is also severely hampered by inadequate staff. By November 2008, TFDA had only 140 employees and was operating in few zonal offices and not even in regions in Mainland Tanzania.

\(^1\)WMA receive Government grant for Personnel Emoluments (PEs) of all staff.
2.1.4 Cereal and Other Produce Board of Tanzania

The Cereal and Other Produce Board of Tanzania (COPB) was recently established under the Act No 19 of 2009. Among its functions, the Board will be responsible to provide grain and other produce, cleaning, drying, weighing, grading and packaging services according to market standards. Therefore, the role of this Board will be crucial in improving both quality and applications of standards and weights and measures in the country for both farmers and traders. There is also established Zonal Council in each agricultural zone dealing with cereals and other produce as specified by the Act. The Board shall have specified commercial functions and in general shall carry out commercial activities and such other activities as are necessary, advantageous or proper for the development of the cereals and other produce industry.

2.2 Policies

There are several national policies which in one way or the other touch the subject matter of this study. However, the core national policies are National Trade Policy of 2003 and Agricultural Marketing Policy of 2008. Both policies were prepared by the Ministry of Industry and Trade (MIT) in collaboration with other stakeholders including the Agricultural Sector Lead Ministries (ASLMs). These specific sector and sub-sector policies culminated into national vision 2025 in terms of long-term planning framework as well as in national strategy for growth and poverty reduction (MKUKUTA II) in terms of specific initiatives to achieve long-term objectives and goals.

Through the MIT, the Government expanded the National Trade Policy (2003) into a separate new Agricultural Marketing Policy (2008) to address specific issues related to agricultural marketing in the country. It is well known that agricultural products in Tanzania is characterised by inadequate adherence to the established set of product quality standards and grades. This problem is further compounded by inadequate product quality and standards inspectorate mechanism at all levels, where some market actors violate standard units of weights and product grades.

To set a strategy to improve the situation and guide in future implementation, the Government prepared the new policy in 2008. The overall objective of the policy is to facilitate strategic marketing of agricultural products that ensure fair returns to all stakeholders based on competitive, efficient and equitable marketing system. In relation to the standardization, weights and measures, the policy came up with the following statements:

a) Capacities of the agricultural marketing actors will be enhanced in meeting quality, grades and standards for domestic, regional and international markets

b) The Government, in collaboration with the private sector, will strengthen mechanisms for accreditation, testing, monitoring the quality, grades and standards of locally produced and imported agricultural products

c) The Government, in collaboration with farmers, groups, association and cooperative societies, will enforce the regulations governing utilization of designated buying posts and centres for agro-products

d) The Government, in collaboration with other stakeholders, will develop and harmonise standards, quality and grades in agricultural marketing.

Tanzania has a good number of national policies in many sectors including in agriculture production and marketing. However, similar to good legislations, the policies alone are not adequate to enforce and implement adherence of grades and standards in agricultural marketing system. A coherence collaboration and framework is needed together with adequate resources to enforce compliance, especially in the economy where the level of education is still low.
2.3 **Legislations**

It is already stated that the regulatory framework in Tanzania is vested in three institutions, each enforcing unique laws. The brief review of the two pieces of legislation related to this study is presented in this subsection of the report. These legislations are the Standards Act No 2 of 2009 and the Weights and Measures Act No 20 of 1982.

2.3.1 **Standards Act 2009**

The core purpose of the Standards Act No 2 of 2009 was to re-establish the Tanzania Bureau of Standards and give it more power to address the issues of grades and standards. TBS, using the power vested to it by the Act is the authority organisation to establish various standards to regulate marketing of agricultural products in the country. These standards are published under the authority of the Executive Council of TBS. The basic information provided under these standards includes:

- Specifications
- Grading
- Packaging and marking
- Testing and analysis.

The standards are prepared on the need basis, and sample of standards reviewed during this study were prepared between 1989 and 2010. The standards were prepared in English language and the study team could not confirm the availability of popular versions in Kiswahili language, in which many Tanzanians could access and read to understand them. However, these standards are available at TBS Library for a small fee charged for photocopying.

The issue with a number of these standards lies to the fact that some of them were prepared long time ago, hence many changes have occurred in the economy and legislations supported them. For example, the enactment of the Standards Act No 2 of 2009, drafting of the new Act on legal metrology and changes on regional and international standards may necessitate the TBS and its stakeholders to review the existing standards in near future.

2.3.2 **Weights and Measures Act, Cap No 340 (R.E 2002)**

The manner in which agricultural goods must be sold in Tanzania is laid out in the Weights and Measures Act No 20 of 1982 and subsequent amendments including Cap No 340 of 2002. According to existing legislation, specific goods must be sold by net weight or measure except when in quantities not exceeding 50 grams or 50 millilitres. There are specified packing standards for agricultural goods as well as specified quantities in which certain goods shall be pre packed.

The Act No 20 of 1982 (Eleventh Schedule) specified maximum weight when grains are packed in containers other than rigid containers of glass, plastic or metal. Common grains are specified as indicated in **Table 2.1** below, while others are specified as less than 100 kg. The only exception is on rice flour which has no limit.

<table>
<thead>
<tr>
<th>Cereal</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize Grain</td>
<td>90</td>
</tr>
<tr>
<td>Maize Flour</td>
<td>80</td>
</tr>
<tr>
<td>Barley</td>
<td>80</td>
</tr>
</tbody>
</table>
Table 2.1: Maximum Quantities in Packing Agricultural Products

<table>
<thead>
<tr>
<th>Cereal</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sorghum</td>
<td>90</td>
</tr>
<tr>
<td>Millet</td>
<td>90</td>
</tr>
<tr>
<td>Rice</td>
<td>100</td>
</tr>
<tr>
<td>Rice Paddy</td>
<td>75</td>
</tr>
<tr>
<td>Wheat Grain</td>
<td>90</td>
</tr>
<tr>
<td>Wheat Flour</td>
<td>90</td>
</tr>
</tbody>
</table>

It is the matter of fact that the Weights and Measures Act No 20 of 1982 is out-dated. The Government through the WMA is in the process of drafting a new Act to replace the Act No 20 of 1982. The draft bill is yet to be submitted to the National Assembly – currently discussions are still on-going between the responsible Ministry, the WMA and the Cabinet Secretariat. The new Act will be known as Legal Metrology Act taking account of more focus on trade, health, safety and environment within the large ambit of legal metrology. Metrology is divided into three components of scientific, industrial and legal. Therefore, the new Act will replace Weights and Measures Act through enactment of Legal Metrology Act.

The review of the draft bill indicated that the new Act will be compact and concise in terms of size to ensure broad coverage of issues, while specific matters will be shifted to specified regulations. However, the study team noted that the draft bill has left out the 11th schedule of the Act No 20 of 1982, which provide specification on maximum weights for packing certain good including cereal crops. With gaps of this kind of information in some of the standards prepared by the TBS, either specific grains standards have to be updated or new schedules inserted into the draft bill.

2.3.3  Tanzania Food and Drugs Act 2003

The quality and safety aspects of food are governed by the Tanzania Food, Drugs and Cosmetics Act No1 of 2003. This Act was enacted for the purposes of regulating food and other manufactured and or imported product products. The Act spells rules and regulations in controlling the quality and safety of food, drugs, poisons and cosmetics, and regulating importation, manufacturing, labelling, marking storage, promotion and general distribution of the aforementioned products or commodities.

2.3.4  Cereals and Other Produce Act 2009

The Government has recently enacted Cereals and Other Produce Act No 19 of 2009 to regulate the cereals and other produce in the country. This Act provides for the development of the growing and placing on the market of edible grains such as maize, oat, wheat, rice, millet and sorghum and other produce to be designated by the Minister and establishes the Cereals and other Produce Board of Tanzania as a body corporate. The Act, among other things, provides for the registration of cereals growers and dealers with the Board and for the licensing of cereals buyer, seller, processor, exporter, importer, warehouse owner or operator and provides rules relative to contract farming by registered farmers. Section 26 of the Act empowers the Minister to prepare and enforce regulations, while Sections 27 and 28A empowers the Board and the Local Government Authorities (LGAs) to prepare and enforce the rules and by-laws respectively.
SECTION 3 AWARENESS OF AGRICULTURAL ACTORS

3.1 General perception

This section of the assessment report covered two important aspects in relation to standardization, weights and measures with reference to cereal crops value chain. The two issues are awareness and monitoring. The practice of selling agricultural crops without the use of certified measuring instruments is commonplace. It is evidently known that most of the trading transactions in rural areas, especially at farm level are conducted without the intervention of the regulators. Therefore, seller (farmer) and buyer (trader) level of awareness and knowledge is crucial in determining fair play and getting reasonable return.

Various reports have cited lack of public awareness and monitoring as major hindrances in market efficiency and fair trading in agricultural crops. Monitoring is mostly the responsibility of public institutions for inspection and enforcement. Awareness is a function of knowledge and level of understanding of market mechanisms and use of information systems to ensure fair deal in crops marketing. Both institutions and agricultural actors have joint responsibility for creating and adopting awareness. In developing countries like Tanzania, Government institutions have high role in creating awareness to the public especially smallholder farmers in rural areas.

3.2 Awareness by small traders

Cereal traders were asked if they were aware and knowledgeable of laws and regulations for the standards, weights and measures of agricultural products in Tanzania. The results showed that overall only 19% of the respondents (traders) were aware of the laws and regulations of the standards, weights and measures. In terms of location, traders in Kibaigwa have high rate of awareness at 30% compared to traders in Mbarali at only 9%.

Also small traders who responded to have awareness were asked to indicate the source of their information (awareness) and knowledge. The results are shown in Figure 3.2 for traders and farmers. In terms of sources of their awareness there was no significant different between traders and farmers with the exception of seminars and workshops, whereby only traders responded to attend. Generally, both traders and farmers indicated very low rate in means of creating awareness as undertaken by the responsible institutions including TBS, WMA and TFDA especially in markets and village collection centres.
3.3 Awareness by farmers

Cereal farmers were also asked the same question if they were aware and knowledgeable of laws and regulations for the standards, weights and measures of agricultural products in Tanzania. The results showed that overall only 11% of the respondents (farmers) were aware of the laws and regulations of the standards, weights and measures. In terms of location farmers in Mbarali have high rate of awareness at 18% compared to farmers in Kibaigwa at only 4%.

Also traders and farmers who responded to have awareness were asked to indicate the source of their information (awareness) and knowledge. The results are shown in Figure 3.4 for farmers. In terms of sources of their awareness there was no significant different between traders and farmers with the exception of seminars and workshops, whereby only traders responded to attend. Generally, both traders and farmers indicated very low rate in means of creating awareness as undertaken by the responsible institutions including TBS, WMA and TFDA especially in markets and village collection centres.
3.4 Institutional monitoring

Cereal farmers and traders were both asked if they know about the existence and role of three regulatory institutions of TBS, WMA and TFDA. For the three regulatory institutions, cereal traders in markets visited were more knowledgeable than the cereal farmers. However, the level of understanding the roles of the three institutions was very low, the highest being WMA known by cereal traders by only 20% followed by TFDA 14% (Figure 3.5). Also there is a very high difference by location between Kibaigwa and Mbarali District.

Cereal traders were also asked to indicate to what extent they agree that the regulatory institutions frequently visited their markets for monitoring activities. Figure 3.6 below shows results of responses on visit frequency by officials from the three regulatory institutions (TBS, WMA and TFDA) including Trade Officers from the District Councils (DC). Majority of cereal traders reported that officials from these institutions do not visit their markets frequently. Trade Officers (District Councils) were reported to visit markets more frequently than the rest at a rate of 46%, while the least visiting officials were from TFDA (6%) and WMA (12%). Due to inadequate capacity and lack of resources, the three regulatory institutions in some cases (e.g. TFDA) are represented by District Council Officers to do monitoring and supervision activities at rural areas. It is not clear whether the district officials have the necessary knowledge and skills to effectively conduct TFDA mandates.
3.5 Creating awareness

Though the level of awareness is still low, the three institutions WMA, TBS and TFDA have been developing and implementing various public awareness and education campaigns on matters relating to standards, weights and measures. Due to various factors such as level of media penetration especially to the rural areas, more efforts are still needed. For example, the period between July and November 2011 WMA has implemented the following awareness programmes:

- 23 articles were published in various local newspapers
- Seven (7) short programmes were aired in the local radio and TV stations
- Three (3) brochures and several stand banners were prepared
- Participated in two exhibitions i.e. Saba Saba and Nane Nane.

WMA staffs in the regions normally educate their customers when delivering services. At present WMA is preparing for its participation in the 50th anniversary of Uhuru and are in the process of updating their website. Generally, WMA is trying to its level best to make sure that its functions are known to the Tanzanian society.
SECTION 4 RAPID ASSESSMENT

This section four of the report addresses some of the issues indicated on the terms of reference and scope of the assignment. The section focuses on feedback received from the interviews carried out to a number of study respondents representing actors along the Agricultural Value Chain (AVC). There are many people involved in the AVC: farmers, local traders, millers, foreign traders, transporters, brokers, loaders, wholesalers and retailers. For the purpose of this study, we focused to three actors along the AVC namely: farmers, traders and transporters. This section is structured under the following headings:

- Farm level
- Market level
- Transporters.

4.1 Farm Level

The agricultural market distortion starts at farm level, especially on two dimensions of measurement (weight) and pricing. The grains market value chain from the producer is linked to markets via a number of intermediaries before reaching final consumers.

During this study a number of questions were asked to small farmers regarding the assessment of standardization, weights and measures upon trading or marketing of their produce. This sub-section is structured under the following headings:

- Measurement
- Trading grains
- Satisfaction.

4.1.1 Measurement

The farmers were asked to respond how they measure their grains while selling to traders. In Mbarali, a common phenomenon was found in farmers responses in terms of using various measurements during trading their paddy produce. A significant number was reported to use debe (44%), 24% use sack size, 26% use kiroba size and 18% use kilogram. Therefore, in total more farmers use volume measurement in selling their paddy in Mbarali compared to weight measurement i.e. kilogram.

Results on measurement were found with small farmers in Kibaigwa (Table 4.1). Majority of Kibaigwa small farmers (94%) reported that they use kilogram to measure when selling their grain produce to traders. However, when asked whether their villages or farmers groups possessed weighing scales, all farmers (100%) reported that none existed in their communities. Therefore, even those farmers reported to use proper measuring instruments means they depend on weighing scales brought by the small traders during trading.
4.1.2 Trading grains

When small farmers were asked to indicate which markets they mostly use to trade their produce, majority in Mbarali reported to use village market (98%) and only 2% sell directly from their farms. Existence of large and well known market in Kibaigwa facilitated majority small farmers to use (98%), while only number of small farmers (2%) sells their produce directly from their farms.

Table 4.2 below summarise the response of small farmers on basic costs involved in selling their produce for an average sack of 100 kg. Results showed that on average a maize farmer spends TZS 63.5 per kg in trading cost, while paddy farmer in Mbarali incurred cost of TZS 54.5 per kg. The difference in trading cost between Kibaigwa and Mbarali farmers were due to transport cost as farmers in Kibaigwa market bring their produce from long distance, while those in Mbarali were selling in near village markets. This indicates that market infrastructure especially rural roads plays important role in determining transaction cost for the farmers.

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Kibaigwa</th>
<th>Mbarali</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiroba size</td>
<td>26%</td>
<td></td>
</tr>
<tr>
<td>Per kilogram</td>
<td>94%</td>
<td>18%</td>
</tr>
<tr>
<td>Sack size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debe size</td>
<td>44%</td>
<td></td>
</tr>
</tbody>
</table>

4.1.3 Satisfaction

In both Kibaigwa and Mbarali, majority of small farmers (98%) depend on markets to sell their produce. With lack of proper measuring instruments in their communities, the farmers depend on small scale traders to measure the quantities of their sell. Distortion of measurement results by small scale traders will directly affect farmers gain and their final producer price. For example in Mbarali, where farmers sold their produce in local markets, where even traders have no weigh scales, grains were measured by volume using either Debe, Kiroba or Sack. This is a point where market inefficiency starts and penalises farmers by selling more and paid less for their outputs. It is not the interest of traders to use standard weigh scales as volume measures tend to favour them and are also easier to tamper with than proper measurement instruments.

Even those traders using standard weighing scales, the reliability and accuracy is another important issue to achieve fairness in the market. When farmers were asked to indicate the level of their satisfaction regarding

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2Kiroba is assumed to be 50 kg, Debe 20 kg and Sack 100 kg.
the measurements used by the traders significant number reported not satisfied. Dissatisfaction level was 40.8% and 36.8% in Kibaigwa and Mbarali respectively (Figure 4.1). Although farmers in Kibaigwa reported to use mostly proper measuring instruments, they reported also a high dissatisfaction compared to farmers in Mbarali who use customary volume measurements.

Figure 4.1: Level for farmers satisfaction with measurements

<table>
<thead>
<tr>
<th>Location</th>
<th>Satisfied</th>
<th>Dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kibaigwa</td>
<td>55.1%</td>
<td>40.8%</td>
</tr>
<tr>
<td>Mbarali</td>
<td>63.2%</td>
<td>36.8%</td>
</tr>
</tbody>
</table>

Satisfied  Dissatisfied
4.2 Market Level

The small traders or intermediaries are important group among the agricultural actors in cereal value chain. Therefore, in this study, separate face-to-face interviews were conducted to a number of small scale traders in Kibaigwa and Mbarali markets. The summary of questions posed to traders in these markets together with their responses is presented under the following major headings:

- Market practices
- Trading margins
- Rapid testing.

4.2.1 Market practices

The traders were also asked to indicate how they measure grains while buying from the farmers and their responses are summarised in Figure 4.2 below. Majority of traders in Mbarali markets reported to use customary volume measures, which include Kiroba (7.5%), Debe (47.1%) and Sack (33.9%). Weighing using kilogram was practiced in Kibaigwa at 97.8% and lowly applied in Mbarali (26.4%).

The traders were also asked to state whether they possessed weighing scales for their operations at the markets. Out of 100 traders interviewed only 2% reported to own their own weighing scales in the markets. These traders were from Mbarali markets, while in Kibaigwa all traders are using weighing scales owned by the market administration. This showed that traders in the market were the second level intermediaries who buy produce from first level intermediaries.
4.2.2 Trading margins

Traders at the visited markets were asked some series of questions to determine the trading margins of cereal produce they trade. Traders were asked to compare the producer and selling prices of cereal produce under the study. Table 4.3 below shows the results of the average prices of the three key produce mainly found in Kibaigwa and Mbarali markets. Maize showed to have a high average trading margin of 16.4% when compared to paddy and rice at 8.1% and 11.3% respectively. Clearly, the paddy milling processes add value in the chain by increasing the average trading margin from 8.1% to 11.3%.

Table 4.3: Cereal crops average wholesale price TZS per 100 kg

<table>
<thead>
<tr>
<th></th>
<th>Producer price</th>
<th>Selling price</th>
<th>Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>34,804</td>
<td>40,510</td>
<td>16.4%</td>
</tr>
<tr>
<td>Paddy</td>
<td>77,667</td>
<td>84,000</td>
<td>8.1%</td>
</tr>
<tr>
<td>Rice</td>
<td>103,975</td>
<td>115,755</td>
<td>11.3%</td>
</tr>
</tbody>
</table>

Table 4.4 below summarises the response of traders on basic costs involved in buying their produce from farmers and bring them to the market for an average sack of 100kg. Results showed that on average it cost a maize trader TZS 106.5 per kg in trading cost, while rice trader in Mbarali incurred cost of TZS 68 per kg. The difference in trading cost between Kibaigwa and Mbarali traders were due to transport cost as Kibaigwa traders bring their produce from longer distance, while those in Mbarali were buying from nearby village markets and milling machines. The results showed that it cost more for traders to bring the produce from the farm level rather than buying produce arrived in the markets. It was stated *anecdotally* that traders compensate this additional cost by playing with measuring instruments using volume instead of weights.

Table 4.4: Traders’ response on trading costs (TZS)

<table>
<thead>
<tr>
<th>Cost element</th>
<th>Maize</th>
<th>Rice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop cess</td>
<td>250</td>
<td>1,146</td>
</tr>
<tr>
<td>Handling</td>
<td>1,250</td>
<td>967</td>
</tr>
<tr>
<td>Transport</td>
<td>8,947</td>
<td>3,511</td>
</tr>
<tr>
<td>Brokerage</td>
<td>209</td>
<td>1,179</td>
</tr>
<tr>
<td>Total cost</td>
<td>10,656</td>
<td>6,803</td>
</tr>
</tbody>
</table>

The traders were also asked to indicate the selling prices for two different grades (Grades I and II) of cereal produce in order to determine the quality-price differentials. The results showed that in Kibaigwa market, the traders selling prices slightly differentiate maize by grades. The average selling price for maize Grade I reported by the traders in Kibaigwa was TZS 40,681, while Grade II was TZS 40,638 a price differential of 0.1%. However, in Mbarali markets, price differential between Grades I and II for paddy and rice were 7.7% and 6.9% respectively. The higher the price differential is a motivational aspect to farmers to improving quality of the cereal produce in order to obtain the highest market prices. The other reason for same quality in maize is the fact that newly harvested maize tends to have similar characteristics in quality, therefore, in the absence of quality inspection farmers and traders both assume their produce to be in Grade I.
4.2.3 Testing weighing scales

During this study, rapid testing was conducted in markets visited for two important dimensions in cereal crops i.e. standard weights and quality. The objective of rapid testing was to carry out market on-site measurement and assess variation of actual against standards. This exercise was carried out by member of our study team while visiting Kibaigwa and Mbarali markets after carrying out interviews with randomly selected traders.

The study plan was to undertake two measurement tests and be able to compare variations in three stages. Testing 1 was conducted using traders’ scales, while Testing 2 was conducted using markets’ scales. The comparison analysis was planned to be in the following stages:

- **Stage 1**: Variation between rapid test results against weights indicated on package labels (sacks)
- **Stage 2**: Variation between rapid test results using traders weighing scales or market scales against standards
- **Stage 3**: Variation on measurements between traders’ scales and markets’ scales.

However, due to lack of scales owned by both traders and markets it was not possible to undertake **stage 3 rapid testing**. The traders in Kibaigwa market use only market scales, while those in Mbarali have no access to market scales.

The results on Testing 1 (**Table 4.5** below) showed that both paddy and rice have more actual weights than weights indicated on the packaged labels of the sacks. The variations in average weight were 8.8% and 1.0% for paddy and rice respectively. However, on maximum weight rice had higher variation at 10% compared to paddy at 5%. The Weights and Measures Act No 20 of 1982 specifies that paddy and rice should be packed with maximum weight of 75kg and 100kg respectively. The study found out that apart from testing results, even labelling of package of paddy and rice were violating the laws by exceeding maximum weights. For example, the variation between average and standard was 48% and 2% respectively. However, based on maximum weights found at the markets, the variations were 68% and 21% for paddy and rice respectively.

<table>
<thead>
<tr>
<th>Result</th>
<th>Tested weight</th>
<th>Labelled weight</th>
<th>Variation %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Paddy</td>
<td>Rice</td>
<td>Paddy</td>
</tr>
<tr>
<td>Average</td>
<td>111</td>
<td>102</td>
<td>102</td>
</tr>
<tr>
<td>Minimum</td>
<td>80</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>Maximum</td>
<td>126</td>
<td>121</td>
<td>120</td>
</tr>
</tbody>
</table>

Testing 2 was conducted using market scales, and this was only done in Kibaigwa where maize was the core cereal produce traded. The Weights and Measures Act No 20 of 1982 specifies the maximum weight for packing maize grain to be 90kg. Although there was no difference between test results and weights indicated on labels, there was significant variation with the standards. The variation of testing results against law specified weights were significant for average, minimum and maximum measures found in Kibaigwa as shown in **Table 4.6** below.
Table 4.6: Rapid Testing 2

<table>
<thead>
<tr>
<th>Result</th>
<th>Test Weight</th>
<th>Label Weight</th>
<th>Variation %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Label</td>
</tr>
<tr>
<td>Average</td>
<td>129</td>
<td>129</td>
<td>0%</td>
</tr>
<tr>
<td>Minimum</td>
<td>126</td>
<td>127</td>
<td>-0.8%</td>
</tr>
<tr>
<td>Maximum</td>
<td>130</td>
<td>130</td>
<td>0%</td>
</tr>
</tbody>
</table>

The implications of these results are summarised below:

- More weights staffed in sacks reduce the number of bags that would be counted if accurate measurement will be used. For example for maize up to 43% less bags will result due to over packing, while paddy and rice will be 48% and 2%. As a result the following effects will occur:
  - The actual market fees collected based on number of package (sacks) possessed by traders will be less than the potential revenue to local authorities
  - Traders will be able to reduce transport cost by negotiating charges on the basis of number of sacks instead of weights with transporters
  - Traders will be able to reduce crop cess to the village administrations or local authorities as payment will be on the basis of number of packages (sacks).

- Large and over-size package materials (sacks and bags) will benefit traders to get more cereal produce from farmers on the basis of using customary volume measures instead of accurate measurement. As the package materials are mostly provided by the traders, the farmers are in most cases required to fill to the top using Debe, Kiroba or Sack. With exception of rice, maize grain and paddy are more prone to this practice hence high loss to farmers. Rice is mostly traded from milling machines where weighing scales are available and used.

4.2.3 Testing quality standards

In order to undertake rapid test on quality of cereal products in markets visited, a plan was to use random selection of packages from the traders and test them using the moisture meter. However, only one market where moisture meter was found and that was Kibaigwa. The moisture meter was owned by the Kibaigwa Market Administration. None of the 100 traders had own moisture meter for cereal grains testing. Out of 47 traders, sample of 43 maize packages were tested using the moisture meter. The results showed that the average moisture was 13.4%, while minimum and maximum were 13.0% and 13.5%. Clearly, the quality of maize found at Kibaigwa does not reach either Grade 1 or Grade 2 in terms of moisture content as per TBS Standard (TZS 438:1989). The maize grain standard specifies that Grade 1 and 2 should have maximum moisture content of 13.0%. The standard implies that maize grain which does not come within the requirements of Grade 1 and 2 and not rejected shall be termed as under-grade.
4.3 Transporters

Transportation is one of the critical components of cereal grains value chain from the farmer to the final consumer. Therefore, in this study a separate category of transporters was interviewed through a series of questions regarding transportation of cereal crops from farmers to the markets. Total of 61 transporters within the vicinity of markets visited were randomly selected for face-to-face interviews. The questions asked and responses are presented in this sub-section under the following major headings:

- Markets link
- Transport cost
- Overloading.

4.3.1 Markets link

The transporters were asked to indicate market links in terms of routes which normally they transport cereal crops. The results of their responses were tabulated in Table 4.7 below. As most of vehicles found around the market were of large carrying capacity, therefore, the results shown below are normal in terms of majority focusing their transport business on long routes such as from district market to traders’ godowns mostly in large cities. Moving cereal crops from farm level to village markets shown to have least participation of these large transporters. The link between farms and village markets is normally through bicycles, animals, carts drawn by animals and other small means of transport.

<table>
<thead>
<tr>
<th>Linkage route</th>
<th>Kibaigwa</th>
<th>Mbarali</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm to village market</td>
<td>0%</td>
<td>20.7%</td>
<td>9.8%</td>
</tr>
<tr>
<td>Farm to district market</td>
<td>6.2%</td>
<td>24.1%</td>
<td>14.7%</td>
</tr>
<tr>
<td>Farm to city market</td>
<td>3.1%</td>
<td>72.4%</td>
<td>36.1%</td>
</tr>
<tr>
<td>Village to traders godowns</td>
<td>3.1%</td>
<td>48.3%</td>
<td>24.6%</td>
</tr>
<tr>
<td>Village to district market</td>
<td>3.1%</td>
<td>24.1%</td>
<td>13.1%</td>
</tr>
<tr>
<td>District market to traders godowns</td>
<td>90.6%</td>
<td>75.9%</td>
<td>83.6%</td>
</tr>
<tr>
<td>Traders godowns to milling</td>
<td>3.1%</td>
<td>39.9%</td>
<td>19.7%</td>
</tr>
</tbody>
</table>
4.3.2 Transport cost

The transporters were asked to indicate their common bases for charging customers when hiring vehicles to move cereal crops from the markets to other destinations. The majority of Kibaigwa transporters (93%) reported that they use weighbridge in terms of tonnes, while in Mbarali; majority (83%) reported to use volume measure in terms of sack, debe etc (Figure 4.3). This is due to the fact that, out of all four markets visited in Mbarali District none had weighbridge compared to the Kibaigwa market.

![Figure 4.3: Basis of setting transport cost](image)

The transporters also reported that on average they charge TZS 6,720 per sack (Mbarali) and TZS 24,015 per ton (Kibaigwa) to bring cereal crops to Dar es Salaam markets. It should be noted that on average it cost TZS 5.40 per 100 kg for one kilometre from Kibaigwa to Dar es Salaam, while from Mbarali it cost TZS 8.90 per sack for one kilometre. The implication is that the transporters are knowledgeable on the overload size of sacks hence demand premium in transport cost. Also indicative premium cost of about 65% could be a result of many factors including high demand of vehicles, poor road condition and long distance from Mbarali compared to Kibaigwa. However, the premium of 65% seems to cover well sacks overload of 43% as indicated previously.

---

3Distance from Mbarali to Dar es Salaam is taken as 755km, while from Kibaigwa to Dar es Salaam is 445km.
4.3.3 Overloading

Nearly all vehicles involved in the transport of produce to market are over-loaded. It is reasonable to assume that in addition to other factors, trucks (large cargo vehicles) accidents are also significantly contributed by overloads. Overloading is common practice by traders trying to minimise transport cost by reducing number of trips or vehicles to hire. This is also common practice due to transporters not charging traders on the basis of accurate measurement but on the number of sacks or bags carried in their trucks. Also in some cases owners of vehicles or trucks play dual role of middlemen (traders) and transporters.

In circumstances where markets have no weighbridge, vehicles overload may be due to poor estimates of weights using number of sacks, which are staffed above the weight limits. However, overload by vehicles originating from markets with weighbridge such as Kibaigwa, overload may be due to decision to carry the cargo by the transporter and or trader.

To test if any of the transporters interviewed had experience in overloading their vehicles, a questions was ask for them to indicate how much was paid as fine at TANROADS weighbridges. Out of 61 transporters 15% had experience of paying overload at TANROADS weighbridges. The average fine was reported to be TZS 266,667 per ton with standard deviation of TZS 43,301. The minimum and maximum charges reported were TZS 200,000 and TZS 300,000 respectively. The variation if paid fine was due to the fact that TANROADS overload fees are quoted in dollars and paid in local currency using the daily exchange rate from the Bank of Tanzania.

TANROADS using Regulations (2001) made under Section 114 (1) (p) of the Road Traffic Act No 30 of 1973 charges road users for vehicles exceeding maximum weight. The Regulations have standard schedule of overload fees ranging from 100 kg (USD8) to over 10 tons (USD 2,986). Therefore, the fine figures reported by the transporters were lying in the range of between 1.5 ton and 2.0 ton overloads. Discussions with TANROADS officials indicated that the trend of its revenue as a result of overload is currently declining due to awareness and size of fine for overloading the vehicles. However, this was not confirmed by the team as the annual reports are yet to be accessed from the TANROADS.
SECTION 5  PRACTICE ON STANDARDS, WEIGHTS AND MEASURES

This section five of the assessment report addresses some of the issues outlined in the terms of reference and scope of the assignment. The sections draw on the results on rapid assessment undertaken in markets visited in Kibaigwa and Mbarali as well as evidence drawn from previous studies and reports through literature review. The section is presented under the following three headings:

• Challenges, benefits and opportunities
• Implication to transaction costs
• Voluntary compliance.

5.1        Challenges, benefits and opportunities

The terms of reference requires the study team to evaluate and document the challenges, benefits and opportunities of enforcement of the existing standards.

The challenges for enforcing the existing standards include the following:

• Standards written in English Language not easily known by smallholder farmers and traders
• Lack of weighing scales at village and farms level
• Affordability of weighing scales to smallholder farmers
• Weak Institutions result in low level of enforcement
• Lack of formal collaboration among institutions
• Low level of awareness among actors, especially smallholder farmers
• Corruption syndrome.

The benefits for enforcing the existing standards include the following:

• Improve smallholder farmers' margins
• Regulate pricing mechanism in local markets
• Improve quality of agricultural products in local markets
• Raise credibility of local markets to buyers and consumers
• Improve revenue generation through the value chain
• Improve health of porters
• Road infrastructure durability
• Reduce number of accidents caused by overload.

The opportunities for enforcing the existing standards include the following:

• Standards exist conform to international requirements
• National laws and regulations exist
• Recently prepared agricultural marketing policy and regulations
• Responsible institutions exist with presence at least at regional level
• Development programmes exist to support institutions e.g. ASDP, PSRP etc.
5.2 Implication to transaction costs

5.2.1 Reduce smallholder farmers’ margins
Use of volume instead of weight measure reduce smallholder farmers margin significantly. The rapid assessment indicated that the margin loss range between 43% for maize and 48% for paddy. Previous study indicated up to 30% loss to farmers. Though no evidence directly found from the farmers, the dissatisfaction of measurement by the smallholder farmers is an indication of the existing unfair practice in trading cereal crops by the small traders and middlemen.

Figure 5.1: Extra weights on measuring and packing cereal crops

5.2.2 Increase transport costs
The tendency to over-pack the sack in order to reduce the number of bags to be carried increases transport cost. It was evident from this study that about 15% of the Transporters reported to be fined for overloading. Also, through data analysis, it became apparent that transport without weighing bag cost 65% more than using standard measurement such as tons.

Figure 5.2: Average transport cost per kilometer
5.3 Voluntary compliance

Voluntary compliance in standards, weights and measures is not common in Tanzania, especially the traders and middlemen have no incentive due to the fact that they benefit on unfair trade practice. The voluntary compliance on the side of farmers is limited due to lack of negotiating and bargaining power, knowledge on market information and lack of weighing scales in rural areas. To solicit voluntary compliance in the country will entail changing the culture in trade and marketing of cereal crops, which requires long-term efforts.

Inadequate enforcement leads to weak voluntary compliance in long-run. The measures to be undertaken in order to agricultural actors voluntarily comply to the standards, weights and measures are presented as list of recommendations and action points in the next section of this report. However, comparison of this study against the previous undertaken in 2004, showed that voluntary compliance is progressing well. Figures 5.3 and 5.4 below show the trend in over-packing maize and rice respectively between the two studies.

Figure 5.3: Trend in over-packing maize (kg per sack)

Figure 5.4: Trend in over-packing rice (kg per sack)
SECTION 6  KEY FINDINGS AND RECOMMENDATIONS

In this section we present the general findings of the assessment of standards, weights and measures study in relation to the cereal grains marketing as well as specific recommendations. The section is structured under the following two main headings: Key findings and recommendations.

6.2  Key Findings

The value chain begins from the grower and ends with the consumer. Transport, storage, handling, marketing and processing and retailing are the services that add value to the product at different points in the chain. The traditional value chain in Tanzania has few intermediaries between the grower and the consumer when compared to other countries. The links are connected mainly by road transport system, which from farm level to district markets is characterised by poor structures and seasonality passage. This has created single flows in the value chain during production process and opposite direction during harvesting and selling. Most of the produce is sold immediately after harvest and no much stock is maintained to take advantage of price increase in later seasons.

The main findings of this study can be summarised as follow:

- Adherence to quality and standards mostly depends on the cost-benefit as well as incentives resulted from the local and international markets in form of price differentials. Generally, the agricultural production in the country has been characterised by poor adherence to product standards and grades due to lack of adequate compensation from traders in local markets. Most of the cereal crops are produced and consumed locally with no incentive to achieve high standards or quality.

- Establishment of the Cereals and Other Produce Board of Tanzania is considered a key step in achieving high standards and quality in future. However, challenges remain in the form of adequate resources whereby many institutions in the country lack capacity to deliver required services as prescribed in their respective Acts.

- Cost implications including crop cess, market fees and transport charge create incentives for traders and intermediaries to over-load the packing beyond standard weights. This is the policy issue in which the Prime Minister’s Office, Regional Administration and Local Government (PMO-RALG) have to review and make changes. The district councils and villages should charge crops cess on standard measurement e.g. per kg or ton.

- In some cases it was reported that WMA charges high fees for certifying the weighing scales on inspections. WMA in collaboration with MIT should review the tariffs and explore the cost-benefit-analysis of ensuring that many farmers through villages, groups and association have more accurate measurement instruments which are affordable.

- Self-regulatory mechanism for the use of standards, weights and measures does not exist. The farmers associations and groups are not well provided with capacity to regulate the market in their favour. For example, lack of guidelines, regulations and standards in Kiswahili language to the farmers’ level is hindrance to gaining fair competition in the local markets.

- Poor infrastructure limits the ability of small farmers to participate directly in cities and national markets, hence reducing transaction cost and increase agricultural produce profitability. It was found that most of the farmers sell their produce to a number of intermediary traders, who take advantage on transport cost, illegal measures on weights and market information.

- Knowledge deficit on small farmers is a major constraint to reduce transaction cost and bargain economic price for cereal grains market in the country. For not using accurate measuring...
instruments alone create significant margin of loss to farmers estimated to be above 40% of the annual sales

- Absence of farmers' groups or association leads to high transaction costs for each farmer and therefore making it not as profitable to participate in the value chain. There is a need for farmers to organise themselves into groups or association and be able to own and access weighing scales and increase their bargaining power for prices in the markets

- Lack of modern markets in some areas also limits the small scale farmers from reducing transaction cost during selling their produce. For example, it was found that most of the small farmers in Mbarali sold their produce through their village markets which are not organised and without adequate market information on prices and demand in other places

- Existence of laws and regulations alone is not adequate to effectively implement a fair and efficient trade and marketing system in the country. Public education, knowledge, awareness and legal enforcement are very important factors. This is an area where RLDC can support through its development programmes in rural areas.
6.2 Recommendations

This report has identified issues that are relevant for improvement of effectiveness and efficiency in the agricultural value chain (AVC) particularly for cereal crops. Generally, the recommendations are centred on improving voluntary compliance and adherence to standards, weights and measures as well as building capacity of regulatory bodies to enforce the legislations and regulations. The following specific recommendations are made on the basis of study findings to the MIT, WMA, TBS, COPB, TFDA and other stakeholders:

<table>
<thead>
<tr>
<th>Action Plan</th>
<th>Timeframe</th>
<th>Priority</th>
<th>Actors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitate capacity building programme for the regulatory bodies through existing reform programmes or sector-wide development programmes. The increase in funding and effective and efficient use of funds is a necessary step to increase capacity of the three bodies i.e. TBS, WMA and TFDA to function effectively and be able to stand on their own. The capacity building programme should include expansion of their presence and visibility throughout the country, short and long-term training, increase their staff numbers and mobility facilities</td>
<td>Long</td>
<td>High</td>
<td>MIT</td>
</tr>
<tr>
<td>Provide initial capital assets of large size weighing scales to farmers through their SACCOS, farmers groups or associations. The use of weighing scales in villages should be charged a minimal fee for future replacement and maintenance. Given the large discrepancies in cereal crops package weights it would be the farmers' interest to ensure that grains are weighed and getting a price based on weight rather than volume</td>
<td>Short</td>
<td>Medium</td>
<td>MIT/WMA/ COPB</td>
</tr>
<tr>
<td>Strengthen the Warehouse Receipt System (WRS) for major cereal crops such as maize, paddy and rice in most of the productive areas of the country to improve farmers' returns.</td>
<td>Long</td>
<td>Medium</td>
<td>MIT, COPB</td>
</tr>
<tr>
<td>Support the Government to speed up completion of the Legal Metrology Act and its enactment</td>
<td>Short</td>
<td>High</td>
<td>WMA/MIT</td>
</tr>
<tr>
<td>Improve public education campaigns and awareness programmes to cover rural areas. Simple strategy such as posters and small banners at rural markets and agricultural collection centres will increase public awareness on standards, weights and measures</td>
<td>Short</td>
<td>High</td>
<td>WMA, TBS, TFDA, COPB, MIT</td>
</tr>
<tr>
<td>Collaborate with the Government in order to increase number of employees especially metrology inspectors to enable WMA to function effectively and cover the whole country.</td>
<td>Long</td>
<td>Medium</td>
<td>MIT/WMA</td>
</tr>
<tr>
<td>Review all agricultural crops standards and align with the Standards Act 2009 and later with new Legal Metrology Act</td>
<td>Long</td>
<td>Low</td>
<td>TBS, MIT</td>
</tr>
<tr>
<td>Efforts should also be directed towards cereal crops in local markets as mandated by the Act. Use standards established by TBS on grains quality and implement inspection campaigns in major markets and later expand to rural markets</td>
<td>Long</td>
<td>High</td>
<td>COPB/WMA/ TFDA, Councils</td>
</tr>
<tr>
<td>Populate standards and regulations in Kiswahili Language</td>
<td>Short</td>
<td>High</td>
<td>MIT, TBS</td>
</tr>
<tr>
<td>Form joint-task force for operation as well as joint collaboration programs with TCCIA and District Councils</td>
<td>Long</td>
<td>Medium</td>
<td>TBS, WMA, TFDA, COPB, MIT</td>
</tr>
<tr>
<td>Enforce import or manufacture of standard size bags and sacks</td>
<td>Short</td>
<td>High</td>
<td>TBS</td>
</tr>
<tr>
<td>Develop topics for education curricula in schools on legal metrology and related aspects</td>
<td>Long</td>
<td>Medium</td>
<td>WMA</td>
</tr>
<tr>
<td>Action Plan</td>
<td>Timeframe</td>
<td>Priority</td>
<td>Actors</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>-----------</td>
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<td>---------------------------------</td>
</tr>
<tr>
<td>Solicit development partners and institutions to support farmer groups</td>
<td>Long</td>
<td>High</td>
<td>MIT, WMA, COPB and TBS</td>
</tr>
<tr>
<td>and associations with training on standards, legal metrology and provision of weighing scales</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review of policy on crops cess that is charged by the District Councils through villages as part of the revenue. The basis should be the standard measurement using weights and not on number of bags (sacks). This will discourage traders reducing the number of bags/sacks by over-loading sacks beyond standard weights.</td>
<td>Short</td>
<td>High</td>
<td>PMO-RALG, MIT</td>
</tr>
</tbody>
</table>
SECTION 7 ANNEXES

List of Annexes:

- Annex A: Persons contacted
- Annex B: Food Grains Standards.
- Annex C: References.
Annex A: Persons contacted

<table>
<thead>
<tr>
<th>s/n</th>
<th>Name</th>
<th>Organisation</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mr Odilo Majengo</td>
<td>Ministry of Industry and Trade</td>
<td>Director of Marketing</td>
</tr>
<tr>
<td>2</td>
<td>Mr Dominic Mwakangale</td>
<td>Tanzania Bureau of Standards</td>
<td>Director of Testing, Calibration and Packaging Services</td>
</tr>
<tr>
<td>3</td>
<td>Mr Ezekiel Ntungi</td>
<td>Weights and Measures Agency</td>
<td>Planning and Monitoring</td>
</tr>
<tr>
<td>4</td>
<td>Mr Wilbald Kimaro</td>
<td>Weight &amp; Measures Agency</td>
<td>Regional Manager, Dodoma</td>
</tr>
<tr>
<td>5</td>
<td>Mr Msekwa Dalali</td>
<td>Kibaigwa Market</td>
<td>Market Manager</td>
</tr>
<tr>
<td>6</td>
<td>Mr Proter Andrew</td>
<td>Kibaigwa Market</td>
<td>Statistics Officer</td>
</tr>
<tr>
<td>7</td>
<td>Mr Paulo Kita</td>
<td>Usangonet</td>
<td>Secretary</td>
</tr>
<tr>
<td>8</td>
<td>Mr Seneda</td>
<td>Weight &amp; Measures Agency</td>
<td>Regional Manager, Mbeya</td>
</tr>
<tr>
<td>9</td>
<td>Mr Mwaikamba</td>
<td>Mbarali District Council</td>
<td>Trade Officer</td>
</tr>
<tr>
<td>10</td>
<td>Mr Vicent Tarmo</td>
<td>Tanzania National Roads Agency</td>
<td>Weighbridge Technical Officer</td>
</tr>
<tr>
<td>11</td>
<td>Mr Logath E Natal</td>
<td>Tanzania National Roads Agency</td>
<td>Weighbridge Technical Officer</td>
</tr>
</tbody>
</table>
### Annex B: Food Grains Standards

The National Standards documented from the Tanzania Bureau of Standards:

<table>
<thead>
<tr>
<th>Number</th>
<th>Standard Title</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZS 799:2004</td>
<td>Agricultural Food Products – Determination of Aflatoxins</td>
<td>2004</td>
</tr>
<tr>
<td>TZS 1257:2010</td>
<td>Textiles – Specification for Open Mouth Woven Poly-Sacks Made from Polypropylene Tape-Yarn</td>
<td>2010</td>
</tr>
<tr>
<td>TZS 592:2004</td>
<td>Rice - Specification</td>
<td>2004</td>
</tr>
<tr>
<td>TZS 328:2010</td>
<td>Maize Flour - Specification</td>
<td>2010</td>
</tr>
<tr>
<td>TZS 874:2006</td>
<td>Pearl Millet/Bulbrush Flour</td>
<td>2006</td>
</tr>
</tbody>
</table>
Annex C: References

The Consultants has received and reviewed a number of reference materials from the RLDC and other sources. The key documents and reports include: