Small scale food processing industries in semi-arid regions of Tanzania: Challenges and opportunity for improving food security in the case of Dodoma City

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ABSTRACT

The global economic collapse has resulted in the emergence of food shortages particularly to developing countries including Tanzania. The concept of food security includes several parameters such as consumption and production of food should be governed by social values that are just and equitable as well as moral and ethical, ability to acquire food is ensured, the food should be nutritionally adequate, personally and culturally acceptable and is obtained in a manner that upholds human dignity. In urban areas of the Semi-arid region of most developing countries food security has several challenges due to rapid urbanization caused by rural-urban migration and natural birth. Dodoma city is among the fast-growing region in Tanzania and it is expected to have rapid urbanization due to the shift of the capital city from Dar es Salaam to Dodoma. Food processing is the best method that could improve food security in this regard. In Tanzania, food processing is done mainly by private sectors and largely by microprocessors who represent about 50.7% using a small machine and manual techniques. However, the food processing industry faces many challenges such as inadequate funding, stringent government rules and rigid bureaucratic procedures, shortage of raw materials, poor technology and unreliable electric power supply. It is therefore recommended to the government to provide more support to the processor including technology, infrastructure and financing. Also, bureaucratic procedures should be reduced so that more people will be attracted to the business.

Key words: Food processing, enterprise, food security, semi-arid, self-sufficient ratio (SSR), population growth.

INTRODUCTION

Dodoma is located in the central part of Tanzania, characterized by a semi-arid climate and is the capital city. With the current upgrading of Dodoma as the capital city, it is expected that the population will increase which also requires an adequate food supply. Food security is a global challenge and a prerequisite for a healthy and peaceful society (Augustin et al., 2016). Furthermore, Ojogho (2010) and Ajibola et al. (2000) contended that food security has an individual, household, national as well as international perspectives. The concept of food security evolved to incorporate important components which reflect different purposes and objectives (Olawepo, 2012). In 1984, Siamwalla et al. have defined food security as ensuring that food-deficit countries or regions or households within these countries meet target levels of consumption, a view that incorporates the effects of both supply and demand. According to Von et al. (1993), food security is access by all people at all times to enough food for an active healthy life. This is important for economic growth and development as healthy individuals can actively engage in social and economic activities. Essential elements of food security are availability and ability to acquire food. On the other hand, food security exists when all people at all times, have physical social and economic access to sufficient, safe and
nutritious food that meets their dietary needs and food preference for active healthy life (McGuire et al., 2015).

In addition, achieving food security requires four important aspects as propounded by Bremner (2012) that sufficient quantities of appropriate foods are consistently available, individuals have adequate incomes or other resources to purchase or barter for food, food is properly processed and stored, individuals have sound knowledge of nutrition and child care that they put to good use and have access to adequate health and sanitation services. From a development perspective, food security is at the top of the list of Millennium Development Goals (MDGs) intending to eradicate poverty and hunger. More than 60 countries have made great progress toward achieving the MDG hunger target 1.C which is to halve, between 1990 and 2015, the proportion of people who suffer from hunger (Bremner, 2012). Nevertheless, achieving food security in Sub-Saharan Africa remains a great challenge and a nightmare. Despite some advances, most of the regions have not reached the MDG hunger target and rapid population growth aggravates the problem (Bremner, 2012). This problem affects more the semi-arid region of Tanzania due to unfavourable climatic condition. In Tanzania there are two distinct semi-arid zone in the central and south east parts of the country. These areas receive unimodal rainfall usually falling during December to March period. The area is characterized by low rainfall associated by low temperature which imposes fundamental limits on plants and animal populations and on human activities such as agriculture. Dodoma is in the central zone and the rainfall is about 500 -800 mm per year (Mbiha).

There are several challenges concerning food security in developing countries attributed to the rapid increase of population due to rural-urban migration and natural growth. The UN report, 2014 revealed that 54% of the world’s population lived in urban areas and it is expected to increase to 66% by 2050 (Malik, 2014). This means that two-thirds of the world’s population will live in urban areas and will require a 60% increase in global food production to meet global food demands as estimated by the UN Food and Agriculture Organization (L’Hermitte et al., 2016). This great transition touches Sub-Saharan Africa (SSA) whereby populations is projected to be more than double from 856 million in 2012 to about 2 billion in 2050 (Bremner, 2012). Thus, new city-centric approaches are required to understand the global food system and to ensure that the production and distribution of food can feed the growing number of urban cities (IUR, 2013). In developing countries like Tanzania, urbanization is under the influence of both natural population growth and in-migration such that more people become permanent consumers in the cities. This means they become separated from the land and other traditional food sources and they mostly depend on purchasing their food from the market system (Wenban, 2016). With regards to Sub-Saharan African’s population was projected to more than double from 856 million in 2012 to about 2 billion in 2050 (Bremner, 2012). Particularly to Tanzania, after two decades following independent population growth averagely nearly 3% P.a while urban population increased by about 5% P.a. Thus, in consequence urbanization increased from 5.7% in 1967 to 29.1 in 2012 (Wenban, 2016). This is to say Tanzanian urban population is set to more than double in 2030 likewise food requirement (Bremner, 2012).

Specifically to Dodoma, it is the expectation that rapid urbanization will hike due to the shifting of the capital city from Dar es Salaam to Dodoma in 2016. Such movement will not only involve civil servants but also other people, mostly business people and entrepreneurs who will take advantage of the process. In this case, it is expected that there will be rapid urbanization. Dodoma is in the Semi-arid region and it is likely to be more affected concerning food security due to the climatic condition of the area. Generally, the Semi-arid region is regarded as a marginal area for agricultural production due to its low unreliable rainfall (Liwenga et al., 2006). This may lead to the recurrent food shortage in the area in such a way that management of severe food shortage and famine has become a way of life in a semi-arid area. Therefore, the Dodoma region being in the semi-arid area but the increase in population has to be assured of food supply all the year round and this is the call for strategies for ensuring food security. Food processing has proven to be among the best method for improving food security and particularly in an urban area where the main source of food is from the rural area. Since food processing increases seasonal food availability and the range of food options available to individuals (Keding et al., 2013). It has multiple effects such as reducing food losses along the value chain, preserve nutrient content, increase the safety and shelf life of foods (Augustin et al., 2016; MANUAL et al., 2004). Food processing involves the transformation of animal, plant and marine materials into intermediate or finished value-added food products that are safer for consumption. It requires the application of labor or energy machinery and it requires a series of processing and scientific knowledge in achieving the desired result (Park et al., 2014).

Ministry of food processing government of India categorize several segments such as dairy fruits and vegetable processing, grain processing, meat and poultry processing, fisheries and consumer foods such as beverage and packed drink (Park et al., 2014; Sung; Keding et al., 2013). It is further classified in three segments as primary processing of food which comprises of sorting, grading and packaging of fruits and vegetables, milk, rice, spices. Secondary processing of food comprises of re-shaping of food for ease of consumption. It includes flour, oil cakes, tea leaf and beverages powder and tertiary processing of food (or) value added food segment which includes processed fruits and vegetables, juices, jam and jelly (Fellows, 2009). The study focused mainly on secondary processing of food, which falls on long-term basis mainly to cereal
products like maize and sunflower seed which are the main crops grown and processed in the Dodoma region. Food processing, in this case, is practiced on a small scale using the small machine and on the medium scale using medium size industries and in most cases is done manually by food processors. According to Crush et al. (2011),70% of food is processed by micro, small and medium private enterprise. The government’s action is to facilitate regulatory and public support functions (Mmasa, 2013). However, in Tanzania, there is no standardized way of recording and monitoring food processors. Some organizations do monitor and keep a record of MSMEs food processors for their purpose. Therefore, it is difficult to assess the amount and quality of processed food which is important in assessing the status of food security for particular areas.

This study revealed that Small Industrial Development Organization (SIDO) has recorded only 65 MSME food processors in Dodoma city of which many of them are maize and seed oil processors. The United Nations Millennium Development Goals of 2000 called for halving the portion of hungry people by 2015. In semi-arid regions achieving the goal has become difficult as the climate is increasingly impacting the production in such a way that there is insufficient food production (Xinhua and Mkonda, 2017). Nevertheless, food processing can be the best method for improving food security as it has several functions as described by Fellows (2009), that it extending the period during which food remains wholesome (microbial and biochemical). Another function of food processing is to supplement nutrients required for health, providing variety and convenience in diet and adding value. Besides, food processing has a multiplier effect within the food value chain. It leads to abundant good quality nutritious and safe foods which are readily available and affordable for consumers (Food Business Africa, 2013). This is to say food processing has an abundant role in improving food security in semi-arid areas like Dodoma where the study was conducted. The study provided answers to the following questions: what are the food requirements of growing Dodoma city? How do food processing and transportation over long distances ensure food security in Dodoma? What are the challenges facing food processors in Dodoma Municipality?

MATERIALS AND METHODS

Study area

Dodoma Municipality covers an area of 2,669 square kilometers characterized with both Urban and rural qualities. It stands on the broad upland plateau with an altitude ranging between 900-1000 meters above sea level. Due to unreliable rainfall caused by semi-arid nature the area has scanty vegetation such as herbs, grasses as well as conspicuous baobab and acacias trees (Figure 1). Based on
the 2012 National Population and Housing Census, the population of Dodoma was 410,956 people of whom 199,487 or 48.5 percent were male and 211,469, or 51.5 percent were female. The estimated total number of households is 74,914 with an average household size of 4.3 people. Administratively, Dodoma city is subdivided in 4 divisions which in turn are divided into 41wards and 188 streets/villages as shown in Table 1. In the urban areas the main activities of the residents are commerce, urban farming and civil service employment while in the rural areas, crop farming and livestock keeping are the prime means of existence. The main crops grown are bulrush millet, sorghum and maize; with bulrush millet (a relatively successful drought-resistant crop) the most important of the cereal crops for home consumption. Bambara nuts and groundnuts are the main pulses grown for food and they are grown just as importantly for sale and consumption. Sesame and sunflowers are two other crops grown principally for sale but also consumed in small amounts. Grapes, the main cash crop, are grown only by the upper two wealthy groups, but they provide an important source of cash indirectly to poorer households who get hired within the vineyards to help prune, spray and harvest. The current study was carried out in Dodoma city and thirty food processors were selected for interview; fifteen for maize processing and fifteen for oil processors. All interviewed food processors were registered by SIDO Dodoma Region. The report from SIDO technical officer showed that only 65 food processors were recorded with the organization in Dodoma city. About 13 (20%) are medium processors, 19 (29.23%) are small scale processors and 33 (50.7%) are microprocessors; with the production capacity of 0.5 to 1.5, tons, 1 to 2 tons and 2.5 to 5 tons respectively. This data reflects that food processing in Tanzania is mostly done by micro-enterprises and on small scale. Nevertheless, it adds value to the food chain and thus improves food security. This study managed to interview only 30 which is 46.15% of food processors, male was 28 equivalents to (93.33%) and female 2 equivalent to (6.67%). This indicates that male dominates the food processing industries in Dodoma city.

Methodology

This study involved a combination of methods to obtain both primary and secondary data for food processing. Primary data specifically focused on obtaining the information about type and source of food processed, challenges facing food processors and the opportunity of food processing as a source of food security in Dodoma city. Primary data were collected using the combination of field interviews, household surveys, focus group discussion and observation. Secondary data include a documentary review to supplement information abstained from the primary sources and included; census reports, journals, research reports and government policy documents. A cross-sectional design was employed to obtain primary data and particularly to obtain first-hand information on the role of food processing in improving food security in the semi-arid region of Tanzania. The main quantitative survey instrument was an interview guide. Quantitative and qualitative data used in the study were analyzed by using descriptive statistics techniques whereby frequencies, percentage and mean were computed and content analysis respectively.

RESULTS AND DISCUSSION

Food processing as opportunity to food security in semi-arid region

Food processing plays a key role in each step of the food system, from production to consumption (Cichoski et al., 2015; Costa et al., 2015; Dwyer et al., 2012). It has important roles in overcoming the challenges of feeding the growing world population which is estimated to reach 9 billion by 2050 (Despain, 2013). Regardless of being in a semi-arid region, Dodoma city has a great opportunity to enhance food processing for better livelihood and food security. Food processing covers several items such as horticulture products, animals' products, fisheries and grain products. Dodoma city then has the opportunity to almost all the products mentioned above. As mentioned earlier that several crops are grown in Dodoma regions in all six districts; Bahi, Chamwino, Kondoa, Mpwapwa and Chemba. In this case transportation from these areas enhances the availability of raw materials for processing industries in Dodoma city. Despite its semi-arid nature, Dodoma is located at the centre of Tanzania and is well connected to other regions by a good transportation

<table>
<thead>
<tr>
<th>Division</th>
<th>Number of wards</th>
<th>Number of Village/streets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>23</td>
<td>120</td>
</tr>
<tr>
<td>Hombolo</td>
<td>7</td>
<td>27</td>
</tr>
<tr>
<td>Kikombo</td>
<td>4</td>
<td>28</td>
</tr>
<tr>
<td>Zuzu</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>188</td>
</tr>
</tbody>
</table>

Source: Dodoma city profile 2012
network such as railway and tarmac roads. In this case, raw materials are also sourced from other regions of Tanzania like Mbeya, Morogoro, Arusha, Songea, Tanga and other places wherever the chance happens. Additionally, the community of the Dodoma region is the livestock keepers whereby several animals are kept such as cow, goats, sheep, pigs and bird species mainly chicken.

Nevertheless, food processing has not gained much attention particularly from the government; the task is left to the private sector. Government is there to regulate and monitor the standard and quality of the process. According to Small Industrial Development Organisation (SIDO), technical officers in the food processing industry range from larger, medium, small and micro-enterprises. These categories are also well elaborated by Small and Medium Enterprise Development Policy (2002) in the Tanzania context. Thus, micro-enterprises are those engaging up to 4 people, in most cases family members, or employing capital amounting up to Tshs.5.0 million. The majority of micro-enterprises fall under the informal sector. Small enterprises are mostly formalized undertakings engaging between 5 and 49 employees or with capital investment from Tshs.5 million to Tshs.200 million. Medium enterprises employ between 50 and 99 people or use the capital investment from Tshs.200 million to Tshs.800 million (TRADE et al., 2002). On the other hand, maize is the most processed carbohydrate energy food and is done largely on a micro-scale using a small machine and manually by several people. The response from one respondent among small-scale maize flour processors said that they are limited by the capacity of the machine and customers therefore can process only 0.5 to 1 tons of maize a day. The respondent further claims that he could do more than that but finance becomes a big problem hence relied upon a small machine to process flour in the micro scale and localized customers.

The financial problem was supported by other researchers that limited access to finance and lack of capital have been identified as constraints to the growth of small enterprises in Africa and elsewhere (Sasidharan and Rajesh, 2014). Financial constraints also limit the market as the producer will produce enough for the localized market as noted in Dodoma city. Sunflower is another crop grown in Dodoma and is processed to produce cooking oil and animal feeds. Unlike maize, sunflower processing has both small-scale processors and medium-size processors whereby small-scale processors can process up to 2 tons and medium-scale size can process up to 5 tons. Despite being on small scale, both products offer the opportunity for food security to the community of Dodoma city and the neighboring districts. This is because it lowers postharvest food losses, increases the shelf life of food and facilitates transportation (Dwyer et al., 2012; Weaver et al., 2014). Also, it facilitates the availability of food throughout the year though at varying prices. During the harvest, the season price is likely to be very low and it hikes after and later in the season. It also provides employment opportunities hence provide income which will ultimately enable accessibility of the food. Moreover, processed food is more likely to be safe for better health as in most cases packaging is done in a hygienic way due to safety regulation done by the Tanzania Bureau of Standard (TBS; Tanzania, 2009). This is also supported by Food Business Africa (2013), within the food value chain improvements to the food processing industry have the most significant multiplier effects. The health of the food processing industry goes a long way to determine the production of abundant good quality, nutritious and safe foods which are readily available and affordable for consumers.

Marketing system for processed food in Dodoma city

The market for the processed food is like motivation to continue with the business. Food processing in Dodoma city is mostly motivated due to readily available market for the product. When asked to mention the consumers of the processed food both maize and sunflower processors respond to have the ready market for their products. Most flour processed from maize is consumed domestically and in nearby districts such as Kondoa, Bahi, Mpwapwa and Chamwino. In the case of oil processed from sunflower together with fulfilling the domestic market, it is also transported to almost around Tanzania regions as it is not all regions in Tanzania that produce sunflower. So, the availability of a market for the processed product is the driver for food security also, as it motivates the agriculture producer to produce more hence improves income security which will enhance the accessibility of food.

Challenges faced by food processors in Dodoma city

Despite abundant opportunities available for food processors in Dodoma city, they encounter many challenges which in one way or another hamper their ability to produce the desired standards. The majority of respondents mention almost similar challenges they encountered in their business. The same challenges were discovered by Ekblom (2016) in his study about challenges facing food processing MSEs in Tanzania. Respondents mentioned factors such as inadequate funding, high price and scarcity of raw materials during off-seasons, unreliable electricity supply and technology and government regulation. Details are elaborated below:

Inadequate funding

Financial constraints of a different kind of business in many African countries and elsewhere have been largely studied and it was reported that limited access to finance and lack of capital are key constraints (Sasidharan and Rajesh, 2014;
Food processing as a business has many regulations which one should adhere before licensed. In Tanzania, there are several departments one has to pass through to qualify as a food processor. These are registration with TIN (Tax Identification Number), securing permission from health department, getting a business license from the department of business in respective to District/city, registration with the Tanzania Bureau of Standards (TBS). Therefore, for the respondents to pass through all the regulation procedures is hard for them as it has long bureaucratic procedures which take a long time to complete and there are some costs to be encored such as registration fee which is to be paid on annual basis. Moreover, adherence to government rules and regulation has several constraints than firms of a larger scale. For most financial institutions, collateral is needed for one to get the loan so for them this rule is a bit hard to fulfill. Also, the interest rate of many financial institutions is very high and they said if you dare to take loan can be a trap of making a profit for financial institution due to high-interest rate set by the institutions.

### Government regulations

Table 2: Tanzania Food Supply Analysis and Self Sufficiency Ratio (SSR) for 2012/2013 to 2016/2017 based on Total food production

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Requirement</th>
<th>Gap/surplus</th>
<th>SSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012/2013</td>
<td>14,680,047</td>
<td>12,197,302</td>
<td>2,482,747</td>
<td>120</td>
</tr>
<tr>
<td>2013/2014</td>
<td>16,015,238</td>
<td>12,767,879</td>
<td>3,247,359</td>
<td>125</td>
</tr>
<tr>
<td>2014/2015</td>
<td>15,413,169</td>
<td>12,975,252</td>
<td>2,437,917</td>
<td>119</td>
</tr>
<tr>
<td>2015/2016</td>
<td>16,172,841</td>
<td>13,300,034</td>
<td>2,600,831</td>
<td>123</td>
</tr>
<tr>
<td>2016/2017</td>
<td>15,900,864</td>
<td>13,300,034</td>
<td>2,600,831</td>
<td>120</td>
</tr>
</tbody>
</table>

Source URT (2018)

Mukantwali et al., 2012; CHU, 2007). Similarly, this was frequently mentioned by almost all respondents in Dodoma city. The respondents reiterate that inadequate funding affects many activities which are vital for business growth. They cannot smoothly run their business due to a shortage of fund which leads to several constraints such as the use of low technology like packaging, many activities to be done manually, work for many hours for themselves due to inability to hire labor and cannot obtain adequate raw materials for processing. All these challenges caused by inadequate funding leads to low quality and quantity of food processed hence low profit. In addition to the above challenges, respondents mentioned to have low access to the loan as most financial institutions have stringent rules with which many food processors in Dodoma city cannot comply and especially for the small and micro scale processors. Although there is an increased availability of credit, they are not easily accessible to many micro-enterprises as said by one respondent a small-scale food processor at Dodoma city. According to Nichter and Goldmark (2009), MSEs tend to face greater financial constraints than firms of a larger scale. For most financial institutions, collateral is needed for one to get the loan so for them this rule is a bit hard to fulfill. Also, the interest rate of many financial institutions is very high and they said if you dare to take loan can be a trap of making a profit for financial institution due to high-interest rate set by the institutions.

Therefore, the mentioned constrain hinder the growth of their business as supported by other researchers (Nichter and Goldmark, 2009), those strict regulations to be followed to obtain license affect the growth of many MSEs, which in turn can limit profit and available capital. It was further pointed out that the regulatory environment hampering small enterprise growth in developing countries and indeed, a negative and statistically significant relationship has been found between regulations and growth in sales (Edwards and Balchin, 2008). Nevertheless, adhering to government rules and regulation has several advantages to food processors which in turn increase profit to them. Being registered by the regulatory authority can enhance the chance to obtain loans from several financial institutions as supported by Sasidharan and Rajesh (2014). Adhering to the regulatory authority and getting the license can grant legitimacy to business owners in terms of obtaining bank loans.

### Shortage of raw materials

Raw material to food processors means the agriculture products to be processed being oilseeds such as sunflowers and maize for flour processing. Therefore the food processing business depends on the good performance of agricultural raw materials. As mentioned earlier Dodoma is a semi-arid region of which all six districts which supply food to Dodoma urban are vulnerable to weather condition such that very few of these commodities are available in required quantity throughout the year to sustain processing industries that is, it depends on the availability of rainfall for easier accessibility of raw material. The problem is worse for small and micro-scale processors who claimed to have inadequate capital to purchase raw material outside the Dodoma region. The report from the food security Department Ministry of Agriculture and fisheries in Tanzania showed that for five consecutive years Tanzania had surplus food production in four years and sufficient food in one year. This is to say that, generally Tanzania produces surplus food. Nevertheless, Dodoma for the same years has experienced a food shortage as translated from Self Sufficient Ration as indicated in Table 2. These factors affect all medium, small and micro-scale food processors but to a varying degree.
Small and micro-scale processors are more vulnerable than medium-scale processors due to low capital and the unavailability of soft loans to them. Self Sufficiency is defined as being able to meet consumption needs (particularly for staple food crops) from own production rather than by buying or importing (Nicholas, 2010). The self-sufficiency ratio (SSR) calculates the percentage of food spent and produced locally. It defines whether the production of agricultural commodities for a country is sufficient to meet domestic needs therefore the higher the ratio the greater the self-sufficiency. The fact is that; if SSR is below 100 then there is a food deficit, if SSR is 100 to 119 then food is sufficient and 120 and above means that food is surplus. From Table 3, it is obvious that raw materials for processing in Dodoma are not sufficient as the region experiences food shortages frequently as translated from Self Sufficiency Ratio (SSR). Therefore, a food processor in Dodoma city can sustain the processing business due to the availability of raw material from other regions of Tanzania. The opportunity is that Dodoma city is located in the central part of Tanzania and it is well connected by tarmac roads and railway in such a way that the transportation of raw material from another region to Dodoma city is easier. Nevertheless, the price of purchasing outside the region is higher than when the material is available within the region. This challenge affects small-scale processors than the medium and larger ones.

### Poor technology and electricity

The world is endowed with well advance technology for industrial business. However, food processors in Dodoma both small and medium scale claimed to use low and labor-intensive technologies. To them, the major reason given was insufficient funds to obtain advanced technology machines. This is also the case with the packaging materials most of which are made locally and not well advanced. The same problem was discovered by Mukantwali et al. (2012), in their study on issues affecting Small and Medium Scale Pineapple Processing Enterprises in Rwanda. They discovered that access to equipment and packaging materials is a problem for small-scale food processing enterprises in Rwanda as well. These enterprises can hardly afford modern equipment and suitable packaging material, which leads to the use of some recycled packaging materials. This problem also affects marketing as the Tanzania Bureau of standard (TBS) requires the certification of packaging material before any product be transported outside the Tanzanian border (TBS, Tanzania, 2009). On other hand, unreliable electricity was also echoed by food processors in Dodoma city. The high price of electricity tariff was also mentioned by the processors and especially the medium food processors. Therefore, respondents said electricity for them was too expensive and unreliable. One cannot predict the sustainability of electricity supply for all the day, leave alone the long process and procedures for installation. Their response is also consistent with previous research that the electricity challenge is twofold in the sense that power supply is both expensive and unreliable, and like with a majority of challenges identified in this study, money is needed to solve the problem. Using a generator makes it possible to operate during power failures, but results in increased production costs (Ekblom, 2016). So not only do processors need to invest in a generator; they also need to be able to cope with the consequences of decreased profit.

### Table 3: Dodoma Food Supply Analysis and Self Sufficiency Ratio (SSR) for 2014/15 to 2016/2017 based on Total food production

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Requirement</th>
<th>Gap/surplus</th>
<th>SSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012/13</td>
<td>567,212</td>
<td>570,876</td>
<td>-3664</td>
<td>99</td>
</tr>
<tr>
<td>2013/14</td>
<td>658,600</td>
<td>594,303</td>
<td>64,297</td>
<td>111</td>
</tr>
<tr>
<td>2014/15</td>
<td>572,177</td>
<td>596,714</td>
<td>-23997</td>
<td>96</td>
</tr>
<tr>
<td>2015/16</td>
<td>690,633</td>
<td>616,506</td>
<td>187,868</td>
<td>112</td>
</tr>
<tr>
<td>2016/17</td>
<td>1,479,496</td>
<td>1,262,624</td>
<td>-1,796</td>
<td>100</td>
</tr>
</tbody>
</table>

Source URT (2018)

**CONCLUSIONS AND RECOMMENDATIONS**

Food processing is vital for food security of any nation thus improve the wellbeing of their people. It increases the shelf life of food and facilitates easier transportation from one place to another. Also, it facilitates the availability of food throughout the year though at varying prices. During the harvest season, price is likely to be very low and it hikes after and later in the season. It also provides employment opportunities hence provide income which will ultimately enable accessibility of the food. Moreover, processed food is more likely to be safe for better health in this case it should be promoted and supported to have good results. The government specifically should be involved in processing by providing more support to the processor including technology, infrastructure and also, financing bureaucratic procedure involved in entering into the food processing business should be reduced so that more people will be attracted to the business. Besides, the government should
promote the processing of animals’ products so that it can prolong its availability and accessibility in a convenient form.

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