

## **AGRIBUSINESS INVESTMENT OPPORTUNITIES IN DODOMA REGION, TANZANIA**

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### **ABSTRACT**

*This paper explored the current production potentials in Dodoma region with emphases on the existing agribusiness investment opportunities. The study employed secondary data from Dodoma region annual reports on agriculture production for 2015/2016 and data from the Tanzania National Bureau of Statistics (NBS) published reports. Descriptive statistics was used in data analysis in which descriptive features such as histogram, bar charts and tables were used in presenting the study findings. The study findings reveal that paddy, cassava, sweet potatoes and pulses have higher productivity in small planted areas posing great opportunity for investment in such crops. Similarly, under cash crops grapes, simsim, groundnuts and sunflower indicated to have high productivity which calls for investment. In the same line, vegetables such as lettuce, tomatoes, Chinese, onions, eggplant and carrot indicated higher productivity. The study further found that sugarcane, pawpaw and banana had high productivity, suggesting suitable investment opportunities in horticulture. Lastly the study recommends modern farming technologies including the use of well-developed irrigation systems and agricultural implements should be adopted. It further recommends the development of processing industries for crops mainly grapes, sunflower, fruits and vegetables.*

**Key words:** agribusiness, investment opportunities, Dodoma, Tanzania..

### **INTRODUCTION**

Tanzania is endowed with enough fertile arable land, diverse climatic zones and plenty of water sources all across the country but only 24% out of 44 million hectares of the total land area suitable for Agriculture is utilized (UNESCO, 2011; NBS, 2014). Currently, it is only 10 % of the arable land is ploughed by tractor and the rest is under hand hoes and ox ploughed (FAO, 2013; (NBS, 2014). In addition, the production is highly dependent on rain fed exposing to crop failure risks. Dependence on rain fed agriculture had undermined the sector contribution on the country's GDP, shrinking from 50% in 1980s to 26% in the recent years (FAO, 2013). Despite the abundance of unutilized land, yet smallholder farmers dominate the agricultural sector in Tanzania cultivating average farm sizes of between 0.9 hectares and 3.0 hectares (NBS, 2014; FAO, 2015). The vast majority of farmers are engaging in subsistence farming and agribusinesses with only one third of the farmers selling at least some of their production to markets (NBS, 2014). However, to cultivate their participation on marketing activities, the improvement of agribusiness sector could add an advantage, This is because agribusiness sector as an expanded agricultural production do encompasses all enterprises that take place inside and outside the farm-gate which bringing products from the field to the consumers (Jamandre, 2010) Therefore, agribusiness does not only include production but also the firms that provide the inputs, process the output, transport and sell the food products to consumers. Findings by (FAO, 2015) indicated that, agribusiness sector in Tanzania is yet at juvenile stage which is dominated by homestead enterprises despite the current government efforts of improving the sector. This implies that, agribusiness and agro-industry system is not developed much to meet the growing global and domestic demand on food and agricultural products (FAO, 2013). It is estimated that, the annual demand for staples in Tanzania stands at 11 million tones and it still expanding because of increased population (UNESCO, 2011; NBS, 2012). The growing local demand has opened new opportunities for increased agricultural and agribusiness products. Therefore, a shift from subsistence to commercial agribusiness is more crucial than ever before. But this will need an urgent focus on investment in agriculture as a business the situation which this paper intended to address.

Similarly, Dodoma Region as part of Tanzania is considered as the semi-arid area with a substantial amount of rainfall both in the short and long rain seasons (ACT, 2011; NBS; 2014). The region covers an area of 41,311 square kilometers and administratively it is divided into seven districts namely Dodoma Urban, Chamwino, Kongwa, Mpwapwa, Bahi, Chemba and Kondoa (NBS, 2012). The estimated arable land for cultivation in Dodoma Region is 1,214,347.16 hectare (ha) while actual cultivated land was 826,275.00 ha (68%), the remaining unutilized land 388,072.16 ha (32%) which poses potential agribusiness investment opportunities in the region (DRC, 2015).

The major food crops produced in Dodoma include maize, paddy/rice, sorghum, finger millet, bulrush millet, pulses (mainly beans, sesame, peas and bambara nuts), cassava, sweet potatoes, bananas and plantains. Maize, sorghum and finger millet are major staple food crops consumed by majority in the region and rice is mostly consumed in the urban areas. On the other hand, crops such as grapes and oilseed crops (sunflower, groundnuts and simsim) are considered as cash income generating crops for most of farmers in the region. Tropical fruits such as oranges, mangoes, papaws (papaya), guava and different variety of vegetables dominate the homestead agribusiness in Dodoma Region (NBS, 2012; DRC, 2015). Currently, no any reported farm(s) on vegetables and fruits are for large scale commercial farming in Dodoma despite of their current potential demand both for industrial and home consumption.

Despite Dodoma being a semi-arid region, yet its population involves in agribusiness productions which are highly dependent on rain fed activities. This kind of production is very vulnerable to climatic and weather changes which in most cases are associated with crop failures. Moreover, even though Dodoma commonly known as a dry land and unsuitable for agriculture activities, but it is blessed with shallow water tables with abundant ground water. It is estimated that, only 15 to 40 feet are required to be drilled to reach the permanent water table in most parts of the region. Currently, majority of farmers who are using irrigation in Dodoma rely only on large bodies of water, including streams, dams and rivers which dry after shortly rain season. The option of extracting ground water in Dodoma could be the best solution for agribusiness sector. Therefore, this paper was intended to explore the existing agribusiness investment opportunities and expose to different local and foreign entrepreneurs and investors.

## **LITERATURE REVIEW**

### **Definition of Agribusiness**

The term agribusiness is important to visualise based on the following three sub-sectors: the agricultural input sector, the production sector, and the processing-manufacturing-distribution sectors, which are highly interrelated as part of a system in which the success of each part depends heavily on the proper functioning of the other two (Breilein and Woolverton, 1991). Moreover, agribusiness was also defined as a generic term for the various businesses involved in food production, including farming and contract farming, seed supply, agrichemicals, farm machinery, processing, marketing, wholesale and retail distribution to final consumers (Alli and Islam, 2014). Generally, the term agribusiness can be said as is the business of agricultural production.

### **Definition of Investment**

Investment is an action of investing of money or capital in order to gain profitable returns, as interest, income, or appreciation in value. In the context of this paper, agribusiness investment will refer to investing of money or capital in all agricultural related operations involved in the production, processing and wholesale marketing of agricultural products in order to gain profitable returns (Alli and Islam, 2014).

### **Staple Food Crops Production in Dodoma**

The major staples food crops produced in Dodoma include maize, sorghum, millet, rice, pulses (mainly beans), cassava, potatoes, bananas and plantains in some areas. The region fall under the Central zone, which is largely semi-arid favor the production of sorghum, millet, maize, oil seed crops, and paddy rice. Among staple food crops, maize and sorghum are the major crops produced in Dodoma mostly in Kongwa, Chemba, Kondoa, Mpwapwa and Chamwino districts. Kongwa being the leading followed by Kondoa and Chemba in maize production. Crops such as cassava and potatoes are produced in small quantities but from literature it shows that, they have higher productivity.

### **Cash Crops Grown in Dodoma**

Dodoma Region is found in Central Plateau zone which is famous for production of fruits such as grapes, mango, papaya, guava, baobab, tamarind and dates (Ministry of Agriculture and Food Security, 2006). Among the fruits produced grape is the major cash crops produced by farmers. In addition, grape production is the main stay for many farmers in Dodoma Municipal and the nearby districts of Chamwino and Kongwa. About 70% of grapes in the region are produced from the urban Dodoma district and rural districts (Chamwino and Kongwa) produce 30% (SNV Tanzania, 2005) (Kalimang'asi, Majula and Naftali, 2014). This crop has multi-usage such that it can be eaten raw or can be used for making jam, juice, jelly, wine, grape seed-extracts, raisins, vinegar and grape -seed oil. Grape production in Dodoma is dominated by smallholder farmers producing grapes on their own land. On average, each smallholder produces 1,630 kilogram of grapes per annum on average of 1.69 acre of land (Kalimang'asi, Majula and Naftali, 2014). However, sunflower and groundnuts as oil seed are also used as income generating cash crops in Dodoma. The two cash crops are produced in all districts of the region even though they are produced on a small-scale level (Match Maker Associates, 2010). With the rapid increase in the Dodoma population caused by the coming of the government offices, investment in large-scale production for cash crops is imperatively.

### **Irrigation status in Dodoma**

Though irrigation holds the key to stabilising agricultural production to improve food security, increase farmers' productivity and incomes and also to produce higher valued crops, only 3% of farming households are using irrigation in Tanzania (NBS, 2014; UNESCO, 2011). Very little irrigation currently depends on the extraction of ground water, which provides a promising area for future development in agriculture sector with direct and affordable benefits to the poor farmers. For semi-arid region like Dodoma where amount of rainfall is limited, extraction of ground water could increase the chance of agricultural production sustainability for both staples and horticultural products. Currently, majority of farmers who are using irrigation in Dodoma rely only on large bodies of water, including streams, dams and rivers which dried after shortly rain season (FAO, 2012). Since the available surface water varies with the amount of rainfall, open wells and boreholes or tube-wells would spread the availability of water throughout the growing season. This will insure households in Dodoma and country at large to be supplied with plenty of food and horticultural products throughout the year. Therefore, option of extracting ground water in Dodoma could be a best solution for poor small-scale farmers. This is due to the fact that, groundwater irrigation systems are less capital-intensive than large surface irrigation schemes (UNESCO, 2011). Also this will reduce the reliance on large bodies of water such as rivers and lakes, and promote more sustainable use of locally water sourced and managed irrigation systems.

### **METHODOLOGY**

The study was conducted in Dodoma Region, the capital city of Tanzania covering all seven districts of the region namely Dodoma, Chamwino, Kongwa, Mpwapwa, Bahi, Chemba and Kondoa districts (Figure 1). The Region was selected because is the capital city of the country and following the current government decision of shifting its offices and economic activities from the Dar es Salaam city to Dodoma effective from September, 2016 to 2020. This decision is expected to have an impact on both production and investments on agriculture and trade. The study was entirely based on secondary data sources which were collected from the Dodoma region annual reports on agriculture production and supplemented with data from the National Bureau of Statistics (NBS) published reports on agriculture. The secondary data was considered to be sufficient to meet the intended goal of this paper as they have ability indicated the potentials in agribusiness investment in Dodoma. The data on area, production, productivity and harvest for season 2014/2015 and 2015/2016 was used for analysis. The data were analysed with the help of Excel and SPSS computer software and the descriptive features such as histogram bar charts and tables were used in presenting the study findings to give a meaningful interpretation. The figure 1 shows the administrative areas covered in the study.



**Figure 1:** Dodoma map showing the study districts

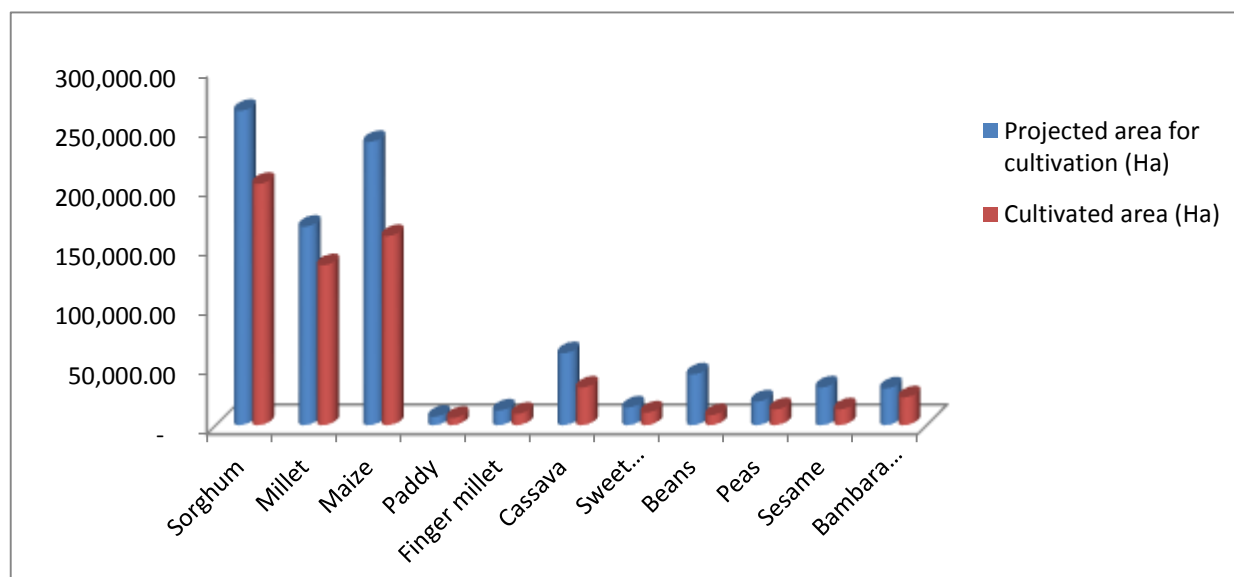
## FINDINGS AND DISCUSSIONS

### Staple Foods

The study considered the major staple food crops that are grown in Dodoma region and these include sorghum, millet, maize, and paddy, finger millet, cassava, sweet potatoes, beans, peas, sesame and bambara nuts. Some of the important variables studied under this consideration were the area under cultivation, productivity and harvest.

### Area under Cultivation of Staple Food Crops

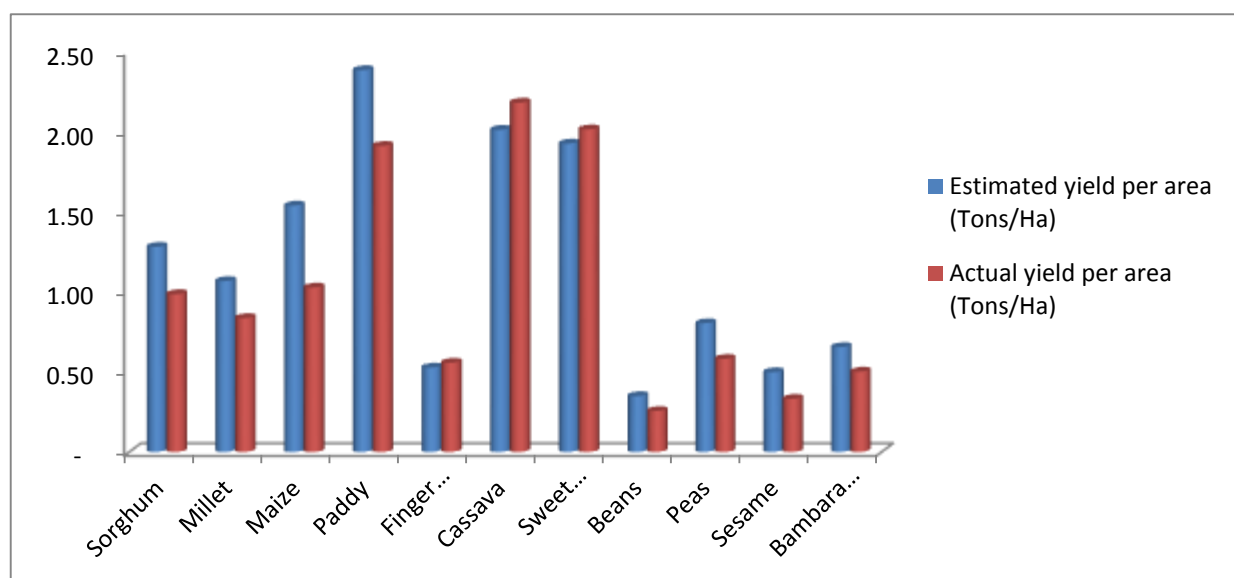
Figure 2 compares the projected area for cultivation against the actual cultivated area. As seen in the figure 2, the major crops that were projected to occupy the largest part of the land that was to be cultivated for staple foods in the growing season 2015/16 were sorghum (264,291.78 ha), followed by maize (238,045.22 ha) and millet (166,782.27 ha). Other staple food crops were projected to take smaller portions of the cultivated land for staple food crops and this can visually be seen in figure 2. The actual cultivated areas for the major crops were 202,818.51 ha for sorghum that makes a difference of 61,473.27 ha which were left uncultivated. Likewise the actual cultivated area under maize production was 158,898.98 ha which again makes a difference of 79,146.24 ha which were left uncultivated and 32,426.65 ha out of the projected area for millet cultivation were left uncultivated after cultivating only 134,355.62 ha of millet. Most importantly, for all the other crops, the actual cultivated area could not meet the targeted area for cultivation of the respective crops. These findings can be attributed to the fact that most of the farmers largely depended on the rain fed agriculture. This reduces the possibility for some areas to be used for cultivation since the farmers could not use other alternatives of production such as irrigation. The other reason could be that farmers depended on the local methods of land tillage such as using the hand hoe and the ox ploughs which could not cultivate large land for planting the crops. In the same line of reasoning, lack of other important farm implements could have also contributed much to cultivating below expectations.



**Figure 2:** Projected Area for Cultivation against the Actual Cultivated Area

### Staple Food Crop Productivity

The next variable to be investigated was the crop productivity. Under this again a comparison was made between the projected yield per area and the actual yield per area as seen in figure 3. Out of the staple food crops studied, paddy, cassava and sweet potatoes were seen to have more yield (Both the estimated and the actual yield) per area. Paddy though cultivated rarely in the region, it is one of the high yielding crops per area. The crop is mainly produced in Bahi and Mpwapwa districts. For this crop, it was expected to have a yield of 2.39 tons per ha and the actual yield turned to be 1.91 tons per ha. Notably, for three crops, cassava, finger millet and sweet potatoes the actual yield per area exceeded the projected yield. For cassava, the expected yield was 2.01 tons per ha while the actual yield was 2.18 tons per ha making an excess of 0.17 tons per ha. The expected yield for sweet potatoes was 1.93 tons per ha while the actual yield turned out to be 2.02 which is an excess of 0.09 tons per ha. Lastly for finger millet, the expected yield was 0.53 tons per ha and the actual yield was 0.56 which makes an excess of 0.03 tons per ha.

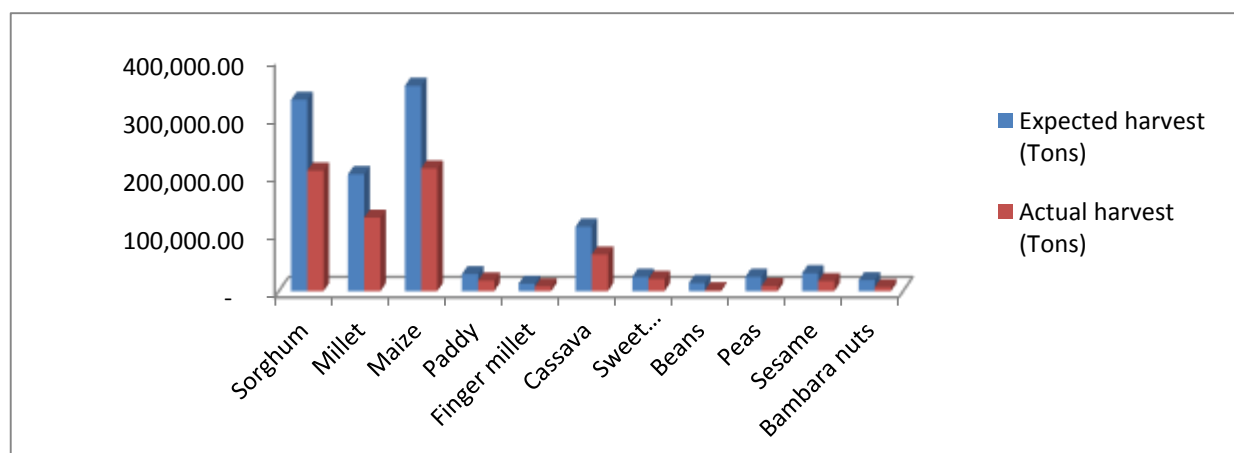


**Figure 3:** Estimated Yield Per area against the Actual Yield per Area

These excess yields per area can be attributed to the virginity of land used for cultivation of these crops. The other staple food crops such as beans, peas, sesame, bambara nuts as seen in the figure yielded less than the expected amount per area.

### Staple Food Crop Harvest

Figure 4 shows the comparison of the expected harvests against the actual harvests for the selected crops. The basic information that can visually be extracted from the figure is the staple food crops that are leading for harvests in Dodoma region. These crops as can be observed from the figure are sorghum, millet, maize and cassava. The projected harvests for sorghum were 329,883.00 tons while the actual harvests were 207,797.45 tons. This means that difference of 122,085.54 tons were not realised in the growing season. The expected millet harvests were 201,649.12 tons while the realised harvests were 126,715.04. The difference of 74,934.08 tons of millet were not realised as expected. The other high yielding crop was maize which was expected to yield 354,098.54 tons. However only 211,427.26 tons were actually harvested which makes a difference of 142,671.28 tons below the projected harvests. The fall in production of maize in Dodoma concurs with findings from KI (2011) and Minot (2014) who found that, maize production in the central zone are in the decreasing rate. Cassava which is the next high yielding staple food crop in Dodoma was expected to produce 111,177.67 tons in the growing season under consideration but the realised harvests were 63,042.92 tons. This implies that the difference of 48,134.75 tons were not realised in the harvest season under consideration.



**Figure 4:** *Expected Harvests against the Actual Harvests of Staple food Crops*

The remaining crops that were considered in this study had their harvests as seen in the figure 4. The basic information that can be extracted from these findings is that for all the staple food crops studied, the realised harvests were below the expected harvests. The possible reasons that explain harvests below projections were unreliable rainfall distribution and use of poor agriculture implements.

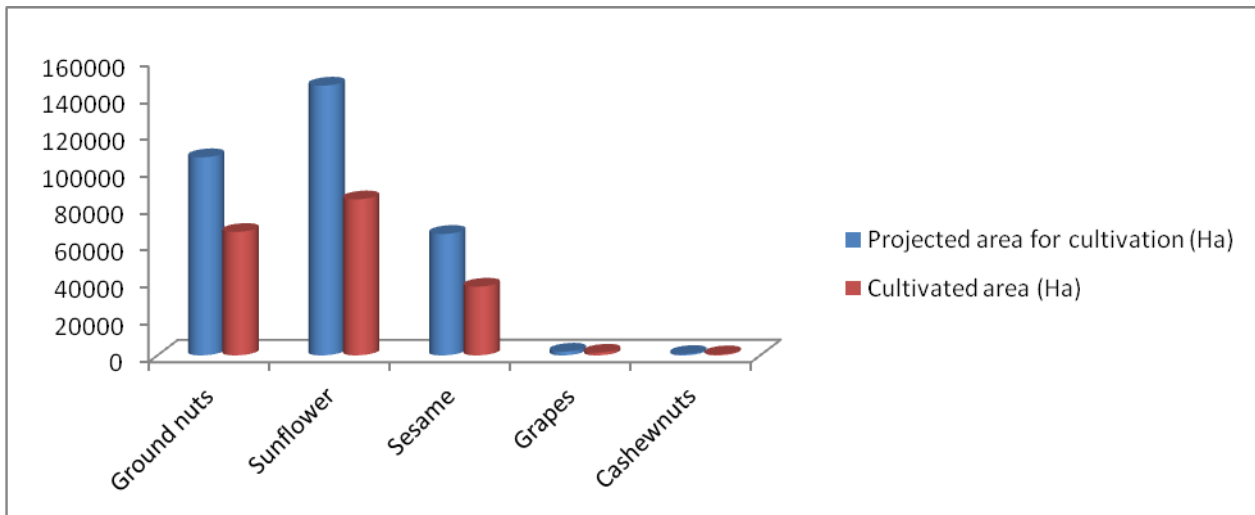
### Cash Crops

Several cash crops were considered in this study which included, groundnuts sunflower, sesame, grapes and cashew nuts. These are the major cash crops that are grown in Dodoma region. Just as in the staple food crops, the analysis was done by looking at three important variables which included area under cultivation, productivity and the harvest of the crops under consideration.

### Area under Cultivation of Cash Crops

Figure 5 presents the comparison between the land projected to be cultivated and the actual cultivated land for cash crops in the growing season of 2015/16. The findings reveal that out of the cash crops grown, sunflower occupies the largest cultivated land for cash crops. This was followed by ground nuts and sesame ranked the third and the other crops were grapes and cashew nuts. About 146,117.68 ha for sunflower were projected to be cultivated in the season but only 84,518.87 ha turned out to be the actual cultivated land for sunflower. There was therefore a difference of 61,598.81 ha which were left uncultivated. For groundnuts the planned land for cultivation was 146,117.68 ha while

the actual cultivated land was 84,518.86 ha. This makes a difference of 61,598.81 ha for groundnuts which were left uncultivated. The other crop that took a large part of the cultivated land was sesame. However, out of the 65,785.01 ha that were planned to be cultivated, only 37,226.89 were cultivated leaving 28,558.13 ha uncultivated. Grapes and cashew nuts were cultivated in small portions which were 1482 ha and 580 ha for grapes and cashew nuts respectively.

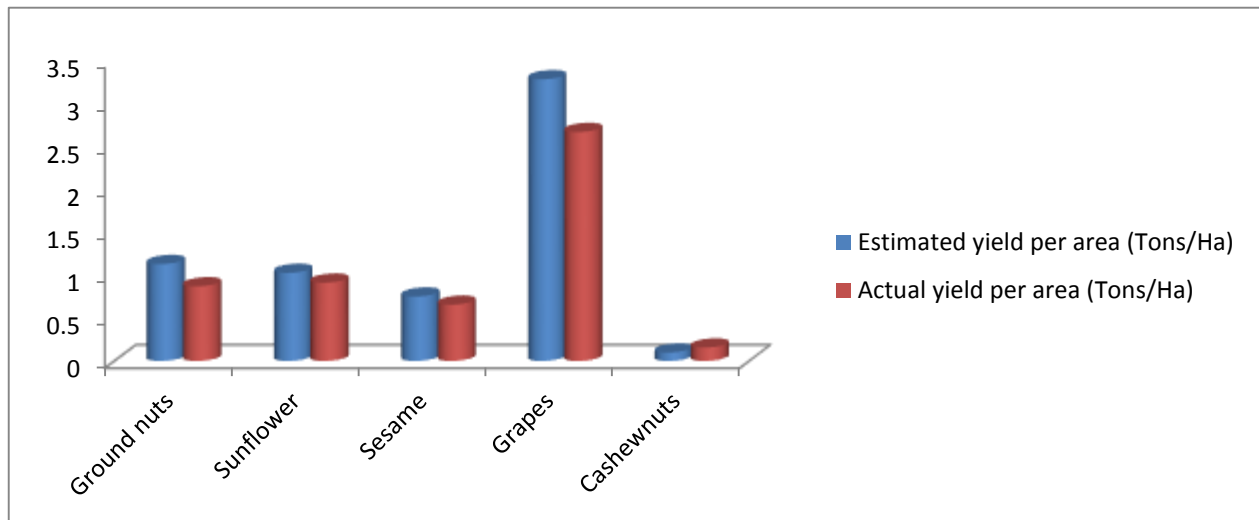


**Figure 5:** Projected Area against the Actual Area for Cultivation of Cash Crops

The basic information that can be deduced from these findings is that the actual cultivated land for all the crops was less than the projected (planned) land for cultivation. This gives an implication that, there is still some idle land in the region that can be used for further cultivation of cash crops. The reasons behind of the inefficient usage of the arable land for the cultivation of cash crops like grapes and cashew nuts is that the crops are capital intensive which makes most of the farmers unable to afford the costs involved.

### Cash Crops Productivity

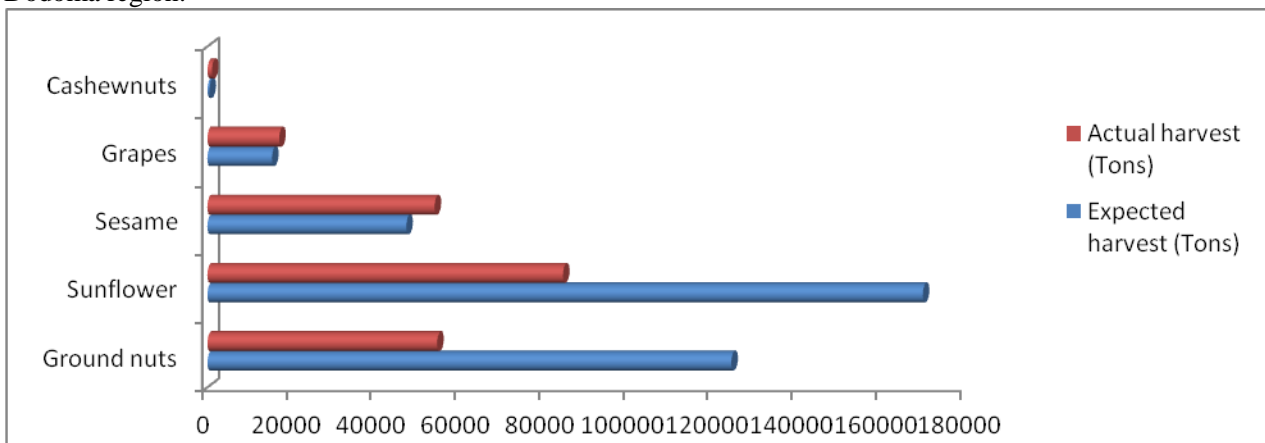
The findings as presented in Figure 6 show that, for all crops except cashew nuts the actual yield per acre is less than the estimated yield. Grapes for example could yield 3.3 tons per ha if cultivated properly but the actual yield is only 2.7 tons per ha for Dodoma region. This means that there is a deficit of 0.6 tons per ha. It is also worth noting that grapes stand to be the highest yielding crops per ha. However the area under cultivation for this crop (1,482 ha) is still the smallest compared to other cash crops in the region. This implies that there is unutilized capacity in grapes production though the crop has a large potential for realizing more output as compared to other cash crops. The unused capacity (deficit in the productivity) for production of the other crops was found to be 0.26 tons per ha for ground nuts, 0.11 tons per ha for sunflower and 0.09 tons per ha for sesame. Interestingly the actual productivity of cashew nuts exceeded the projected productivity by 0.05 which also sends a good signal to investors in cash crop production.



**Figure 6:** *Estimated and Actual Productivity per Area*

### Cash Crops Harvests

Figure 7 shows the comparison of the planned harvests against the actual harvests of the selected cash crops in Dodoma region.



**Figure 7:** *Estimated and Actual Harvests for Cash Crops*

The findings in Figure 7 show that for two crops (groundnuts and sunflower), the actual harvests were below the expected harvests though the cultivated land for these crops was large compared to other crops. This can be attributed to challenges such as high price of farm implements and inputs and inadequate knowledge on improved agricultural technologies among farmers. However, for the remaining cash crops studied, (cashew nuts, grapes and sesame) the actual yield exceeded the expected yields. There was an excess of 6716.3 tons for cashew nuts, 1687.9 tons for grapes and 602.0 tons for sesame. This means that the potentiality for high yields in these crops is high in the region.

### Horticulture

This was one of the important agricultural activities investigated in the study area. The study analysed the area under production, the productivity and the harvests of both vegetables and fruits as components of horticulture practices in the region.

### Vegetable Farming

Several vegetables were found to be commonly grown in Dodoma. These include spinach, amaranths, tomatoes, chinese, onions, okra, lettuce, egg plant, bell pepper and carrots. The analysis took into consideration the area under cultivation, the productivity per area and the harvests of the vegetables in the growing season 2015/2016.

### Area under Cultivation of Vegetables

Findings in Table 1 indicate that tomatoes are the leading vegetable to have the largest cultivated area (7,012.10 ha) compared to other vegetables. Other vegetables with large cultivated areas (ha) include lettuce (3,995.36 ha), onions (2,173.64 ha) and amaranthus (327.70 ha). As a matter of fact, cultivated areas for these vegetables exceeded the projected areas (ha) implying satisfactory initiatives have been taken by vegetable growers in regard to these vegetables. Other vegetables such as spinach, chinese, okra, egg plant, bell pepper and carrots though their cultivated areas have exceeded the projected areas but still the differences between cultivated and projected areas is meager, implying under production of such vegetables.

**Table 1:** *Projected and Actual Cultivated area for Vegetables*

Crop	Projected area (ha)	Cultivated area (ha)	Difference (ha)
Spinach	42.50	71.50	(29.00)
Amaranths	112.93	327.70	(214.77)
Tomatoes	457.56	7012.10	(6554.54)
Chinese	62.92	84.40	(21.48)
Onions	242.60	2173.64	(1931.04)
Okra	48.74	26.90	21.84
Lettuce	178.70	3995.36	(3816.66)
Eggplant	56.12	121.90	(65.78)
Bell pepper	100.04	121.20	(21.16)
Carrots	95.88	125.61	(29.73)

### Productivity of Vegetables

Regarding productivity, all vegetables indicated lower actual yield (Tons per ha) than estimated yield (Tons per ha) except bell pepper and carrots which indicated higher actual yield than estimated, implying that good efforts were made by smaller holder famers in improving the productivity of carrots and bell peppers. Given this trend, the findings generally indicate that vegetables such as lettuce, tomatoes, Chinese, onions, eggplant and carrot have higher actual productivity compared to other vegetables, suggesting great potential investment opportunity for such vegetables if technological innovation is adopted including irrigation and agricultural implements.

**Table 2:** *Estimated and Actual Productivity for Vegetables*

Crop	Estimated yield (Tons/ha)	Actual yield (Tons/ha)	Difference (Tons/ha)
Spinach	5.62	4.32	1.31
Amaranthus	3.93	3.57	0.36
Tomatoes	9.56	7.93	1.62
Chinese	8.13	7.20	0.93
Onions	10.20	6.74	3.46
Okra	5.57	5.29	0.29
Lettuce	14.29	9.57	4.71
Egg plant	12.21	6.16	6.01
Bell pepper	3.39	4.13	(0.73)
Carrots	4.86	7.00	(2.14)

### Vegetable Harvest

The findings on the harvests of vegetables showed that tomatoes, onions and lettuce had the higher harvests compared to the other vegetables. There were 87904.26 tons of tomatoes, 17531.04 tons of onions and 88998.04 tons of lettuce. The vegetables that had low harvests were okra (200.62), chinese (544.44), and bell paper (597.12). For most of the vegetable crops, amaranths, tomatoes, lettuce, eggplants, bell pepper and carrots, the realised harvests exceeded the planned harvests. This implies that there were considerable efforts in expanding the harvests of these vegetable crops in this growing season. The remaining vegetable crops (chinese and okra) realised harvests less than

the planned harvests. This condition is possibly due to common challenges such as plant pests and diseases, use of poor agriculture implements and insufficient irrigation infrastructures facing the growers of these vegetables.

**Table 3: Projected and Actual Harvests for Vegetables**

Crop	Projected Harvests (Tons)	Actual harvests (Tons)	Difference (Tons)
Spinach	364.34	616.74	(252.40)
Amaranthus	659.46	2548.16	(1888.69)
Tomatoes	7665.52	87904.26	(80238.74)
Chinese	838.80	544.44	294.37
Onions	2810.80	17531.04	(14720.24)
Okra	404.72	200.62	204.10
Lettuce	4250.56	88998.04	84747.48
Egg plant	796.26	2023.45	(1227.19)
Bell pepper	286.08	597.12	(311.04)
Carrots	342.44	932.18	(589.74)

### Fruits Production

Different varieties of fruits were found to be commonly grown in Dodoma region mostly by smallholder farmers. These include pawpaw, mangoes, banana, guava, rosella and sugarcane. The analyzed variables include area under cultivation, the productivity per area and the harvests of the vegetables in the growing season 2015/2016.

### Area under Cultivation for Fruits

Findings as presented in Table 4 shows that, sugarcane, banana and pawpaw had shown to have the largest cultivated area (7, 893.71 ha, 242 ha and 212.85 ha in that order) compared to other fruits. The cultivated area (ha) for the three fruits exceeds that was projected, this implies that farmers in the region have invested more efforts on these fruits. This could be due to their high demand both in rural and urban center in Dodoma and other parts of Tanzania. In contrast, guava and mangoes experienced the lowest cultivated areas in the region down to 62 ha and 81.5 ha respectively. The possible explanations for lowest land located for guava and mangoes is that, the two fruits yet are considered as none commercial for most of farmers in the rural areas.

**Table 4: Projected and Cultivated Land for Fruits**

Crop	Projected area (ha)	Cultivated area (ha)	Difference (ha)
Banana	74.78	242.00	(167.22)
Pawpaw	128.72	212.85	(84.13)
Mangoes	207.48	81.57	125.91
Guava	95.26	62.00	33.26
Rosella	1800.00	1320.00	480.00
Sugarcane	195.4	7893.71	(7698.31)

### Productivity of Fruits

Table 5 presents the productivity of the various fruits as produced in the study area. The findings indicated that, sugarcane and pawpaw have the highest yield per ha compared to the rest of fruits in the region with actual yield of 10.71Tons/ ha and 10.5 Tons/ha respectively. Banana was ranked as a third fruit in terms of productivity after sugarcane and pawpaw. Even though their actual yields does not exceed the projected yields (Tons/ha), yet it is enough to say that, investing more on the production of sugarcane and pawpaw will bring more returns to farmers. Other fruits such as rosella, guava and mangoes have shown less productivity compared to other fruits. The lower productivity for these fruits could be explained by the reason that, farmers in the region produce them for home consumption only; therefore less effort is being invested in improving the productivity.

**Table 5: Productivity of Fruits**

Crop	Projected yield (Tons/ha)	Actual yield (Tons/ha)	Difference (Tons/ha)
Banana	11.43	9.43	2.00
Pawpaw	11.14	10.50	0.64
Mangoes	6.71	3.00	3.71
Guava	3.43	2.19	1.24
Rosella	0.06	0.00	0.06
Sugarcane	10.71	10.71429	0

### Fruits Harvest

Findings as presented in Table 5 indicate that, banana, pawpaw and sugarcane are the leading fruits in term of actual harvest in the region compared to other fruits. Sugarcane experienced the largest harvest (471,768 Tons) followed by pawpaw and banana with the harvest amounted to 7,673.31 tons and 2,268 tons respectively. The higher harvest achieved by sugarcane are the reflection of the largest productivity (10.5 Tons/ ha) as shown in Table 5. On the other hand, guava and mangoes have experienced the least harvest which amounted to 223.67 Tons and 317.85 Tons respectively. These findings further indicate that, there is still a potentiality in production of sugarcane and pawpaw in Dodoma. This is due to fact that, actual harvest overpasses the projected ones.

**Table 5: Projected and Actual Harvest for Fruits**

Crop	Projected Harvest (Tons)	Actual Harvest (Tons)	Difference (Tons)
Banana	1,845.00	2,267.99	-422.99
Pawpaw	619.80	7,673.31	-7053.51
Mangoes	880.90	317.86	563.04
Guava	329.78	223.67	106.11
Rosella	720.00	396.00	324.00
Sugarcane	8,182.00	471,768.56	-463,586.56

### Food consumption in Dodoma Region

This study derived the current and projected food consumption statistics from the current population and the expected population increase in the coming five years following the expected relocation of the government headquarters from Dar es Salaam to Dodoma. Currently the population of Dodoma region is 2,083,588. This includes 1,762,394 inhabitants in the rural (suburban area) and 321,194 inhabitants in the urban area (NBS, 2012). Therefore (other factors remaining constant) the current consumption of food crops in the region is based on this population. Following the aim of the government to relocate its headquarters from Dar es salaam to Dodoma within the next five years, a total of 250,000 employees are expected to come to Dodoma within the period. This also means that the employees are also expected to come over with their families. The national average household size for Tanzania is 4.7 members who can be approximated to 5 members per household (NBS, 2014). From the national household size we can arguably say that the expected population increase in the urban area is 1,250,000 which is the expected employees coming to the region (250,000) multiplied by the number mean national household size (5). This expected population is about four times of the current inhabitants in the urban area of Dodoma (321,194). This means that the urban population is expected to increase by four times. Rationally, the current consumption of food crops is also expected to increase by four times. This implies that, the current staple food production must be increased to meet the expected increase in market demand for food. Consequently, additional investment in food and horticultural production is call upon.

## CONCLUSION AND RECOMMENDATIONS

### Conclusion

The aim of this study was to explore the available agribusiness investments in Dodoma Region as created by the current agricultural production potentials. Regarding food crops, the findings from the study indicated that there was lower productivity (tones/ha) in all food crops. Similarly, the findings further indicated that the actual harvest (tones) almost in all food crops is lower than the expected harvest. However, the findings reveal that crops like sorghum,

millet and maize dominated to have larger areas planted but their productivity was smaller than that of paddy, cassava, sweet potatoes and pulses that were planted in smaller areas. This implies that there is great opportunity for investment in paddy, cassava, sweet potatoes and pulses that have higher productivity in small planted areas.

Regarding cash crops, the findings from this study show that sunflower and groundnuts produce bumper harvest compared to simsim and grapes. These findings further depict that the bumper harvest of sunflower and groundnuts is in proportion with the areas planted. However, grapes that are planted in the smallest area have proved to have the highest productivity followed by simsim. This implies that grapes have the greatest potential for investment followed by simsim. On the other hand, sunflower and groundnuts can still be grown as they cope with semi-desert climate and yet sunflower oil is highly consumed in Tanzania given the fact that it is cholesterol free. In the light of this, sunflower poses a great potentiality for investment basing on its high consumption.

Further, the study concludes that, vegetables such as lettuce, tomatoes, chinese, onions, egg plant and carrot indicated higher productivity, posing great potential for investment opportunities in horticulture. Most importantly, carrot and bell pepper indicated higher actual productivity than estimated productivity, implying that any technological improvement made will result into productivity. In the same line, the study further concludes that sugarcane, papaw and banana showed high productivity (Tons/ha), suggesting suitable investment opportunity. Generally, the findings revealed existence of potentials in investing on production of staple food crops such as cassava, paddy, sweet potatoes and pulses particularly in Kongwa and Bahi districts. However, horticultural and oilseeds crops seems to grow well in Dodoma Urban, Kongwa and Chamwino district which include grapes, sunflower and simsim.

## RECOMMENDATIONS

Basing on the findings from this study, following recommendations are proposed.

Piped water from deep wells and high potential of exploiting underground water should be developed by the government in collaboration with practitioners in the sector in order to enhance irrigation systems for enhancing horticultural production and reduce dependency on unreliable rain feed agriculture.

The government through the Ministry of Agriculture, Food and Livestock should strengthen Research and Training institutions particularly Hombolo and Makutupora in order to develop appropriate seed varieties, technologies and training of farmers.

The findings have shown that the actual productivity of the horticultural products was above the projected productivity. This calls for the government through the Ministry of Agriculture, Food and Livestock in collaboration with the practitioners in the sector to develop small scale processing industries in order to add value and minimize wastes. The study further recommends to the ministry and practitioners to develop processing industries for cash crops mainly grapes and sunflower which possess high productivity.

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