



## BENEFITS ASSOCIATED WITH SMALLHOLDER FARMERS' PARTICIPATION IN GRAPES VALUE ADDITION: A CASE OF DODOMA CITY JURISDICTION, TANZANIA

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### ABSTRACT

This study intended to establish benefits associated with smallholder farmers' participation in grapes value addition in Dodoma, Tanzania. The study used a cross-sectional research design to get information from respondents. Slovin's sampling technique was used to get a sample size of 180 respondents. Questionnaire and checklists were the main data collection tools. A gross margin analysis was used to analyse benefits associated with smallholder farmers' participation in adding value to grapes. Results revealed that profitability differs with the type of value addition practices among smallholder farmers. Raisins were found to have more profit (40%) followed by input usage (16.7%) and the rest were found to have small profit, (10%) for bulk wine and (9% for packing and grading). It was concluded that smallholder farmers who add value to grapes get more profit compared to their counterpart who did not do that. This implies that, there were benefits associated with adding value to grapes. It is recommended that extension services should be provided to smallholder farmers participating in value addition in order to enable them applies adequate value addition methods which will provide them with maximum profit.

**Keywords:** Grapes, Grape production, Grape value addition, Smallholder farmers, Value addition

**Paper type:** Research paper

**Type of Review:** Peer Review

### 1. Introduction and Background to the Study

Globally, grape production mostly known as viticulture is considered as an ever-evolving sector due to the enormously growing wine industry which depends mostly on grapes (Creasy, 2018). Grapes (*vitis vinifera*) are one of the most important and widely grown economic crops in the world and have been used to make wine (Senthil *et al.*, 2011). Among the major grapes growing countries in the World is China, holding the top position with 14.5% of all world grapes produce followed by Italy which produces 7.9% of the World grapes; USA produces 7.1% while France, 6.4%. Other countries leading in the production of grapes include Spain, Turkey, India, Chile, Iran, South Africa, Australia, Argentina, Egypt, German, and Brazil. These countries all together account for about 75.8% of the total World's production (International Organisation of Vine and Wine, 2017). Tanzania holds the 77<sup>th</sup> position in grapes production where the top ten grapes producing countries produces approximately 70% of the world's grapes production (Creasy, 2018).

Market liberalisation and globalisation led to the transformation in agriculture and agri-food markets all over the globe. Such changes are due to high-value food products including fruits, vegetables and animal



products. However, the transformation has brought challenges to farmers who are supposed to participate in high-value commodities that have a strong potential for higher returns to land, labour and capital (Birtal *et al.*, 2007). Value-added grape farming is fundamentally market-driven where farmers are urged to cope with the demand of the changing markets (Roy *et al.*, 2013). In Minnesota, farm wineries enable farmers practice value addition by processing bulk wine that generates revenue beyond raw crop production from the farm (Sullivan, 2012).

In Africa, value addition is worthwhile for farmers as it can transform unprofitable agriculture into a profitable venture (Fleming, 2005). Despite agricultural challenges facing many developing countries in Africa, some of them are trying to perform value addition for agricultural improvements (Gashaw, 2018). This indeed reveals the importance of agricultural value addition was due to integration of value chains among farmers. South Africa enabled farmers to produce bulk wine that helps the country to continue being one among the African countries exporting bulk wine at high rate, exporting nearly 350 million litres per year (Vink, 2019).

In Tanzania, large vineyards are located in Dodoma. Thus, Dodoma is the major grape growing region (Mpore, 2013). The most common grape variety grown in Dodoma are Chenin Blanc, Syrah, Cabernet Sauvignon and indigenous variety locally known as *Makutupora* in Dodoma (Kalimang`asi *et al.*, 2014). Statistics indicate that there has been an increase in grapes production over years on an average, the region produces about 10 000 tons of grapes per year (Dodoma Municipal council, 2016). There has however been consistent complains by grape farmers in Dodoma about lack of market for their produce despite the increased production. Due to the increased production and lack of market, sometimes grapes are left to rot in farms as a means to resist buyers' dictation on pricing which is usually perceived to be low and does not give profit to farmers (Mbugi 2020). Evidence suggests that promoting value-added practices among farmers typically improves their productivity and profitability. This is because the practice enables farmers and other actors to enhance the systems for transportation, storage, and processing while also increasing farmers' access to markets. Turning grapes into other forms has developed huge returns and marketing channels. Regarding grape production, value addition has been successful in many countries through wine processing and raisin production (Chervin *et al.*, 2012).

In understanding the importance of value addition, the government of Tanzania, through Agricultural Sector Development Strategy II of 2015–2024 and 2025, has emphasised value addition by highlighting initiatives and strategies to enhance infrastructure and offer technical assistance to farmers. Subsequently, attention has been paid on promoting agro-processing for value addition such as grading, milling, canning, juice making, and promoting improvement on packaging, handling, and transporting agricultural products (URT, 2015). Despite the adoption and emphasis on value addition practices in Tanzania, value addition is not a common practice to all smallholders including grape farmers. There was no evidence on whether there were benefits associated with smallholder farmer's participation in adding value to grapes or not.

Several studies including the study by Kulwijila *et al.* (2018), Donkor (2018), Makindar *et al.* (2018), Patrick and Michael (2016), Tadesse *et al.* (2016), Lwelamira *et al.* (2015), Kalimang`asi *et al.* (2014) and Tara (2011), have been carried out on grape value chains and economic analysis of the smallholder's production and marketing of grapes. However, there were limited studies on benefits associated with value addition to grapes among smallholder grape growers in Dodoma Region. Therefore, the findings of this study contribute to the understanding of whether farmers' participation in the grapes value addition translates into tangible benefits. Specifically, the study examined the awareness and engagement of smallholder grape farmers in value addition, and the identification of benefits associated with smallholder grape growers' involvement in value addition. The study is thought to be significant in enlightening all the key players in grape production and value addition to the produce as well as determining forms of value addition that were more profitable to smallholder grape growers.

## 2. Theoretical Framework

The study used social exchange theory to explain the benefits associated with adoption of value addition practices on grape farming. The theory emanated from the work of sociologists, Blau (1964), Homans (1961) Thibaut and Kelley (1959) who focused on the rational assessment of self-interest in human social relationships. The theory's fundamental principle is that humans in social situations choose behaviours that maximise their likelihood of meeting self-interests. Social exchange theory operates on the assumption that individuals are generally rational and engage in calculations of costs and benefits in social exchanges. Also, social exchange theory builds on the assumption that those engaged in interactions are rationally seeking to maximise the profits or benefits to be gained from those situations. That individuals are driven by this question 'what is in it for me? According to Blau's (1964) observation, individuals participate in an activity or maintain a relationship if they can satisfy their self-interests and at the same time ensure that the benefits outweigh the costs. Supporting theoretical discourse on determinants of participation, Lwelamira (2015) reveals that peoples' motivation to participate in collective action is a result of their expectations such as access to services and maximisation of self-interest. Therefore, in this context farmers' attitude and willingness to participate in grape value addition depends on several motivating factors as their expectation, better prices for their produce, market access, increase in production and increase in income.

## 3. Literature Review

Different scholars including Kirimi *et al.* (2011) have discussed value addition on agricultural products. However, many studies have concentrated on value chain; forgetting about how farmers can participate in value addition of their products for the purpose of strengthening market of their produce. Thippanna *et al.* (2016), for example, conducted a study on economics of processing and marketing of different value-added products of grapes in north Karnataka. The study findings revealed that the total cost incurred in processing grapes into one quintal of raisin and hundreds litre of wine worth Indian Rupees (Rs). 5 835 and Rs. 5 856, respectively. Consequently, the degree of value addition in the case of grape raisins and wine was found to be 56.22% and 56.88% respectively. Then, it was also found that, there were great opportunity to integrate and strengthen value chain in processing and marketing of value-added products.

On the other hand, Tasevska (2012) affirmed that substantial efficiency improvements were possible on grape; with the potential for cost decrease of 29% (20% and 36% with parametric and bootstrapping applied). If farmers manage inputs more efficiently at a time, farmer revenue can be improved by 47% (61% when bootstrapping applied) and manage to increase the value of outputs (value addition). In addition, Tara (2012) conducted a study on value chain analysis of grapes in Nandi valley in Karnataka. The study findings revealed that the process of value addition starts at the stage of trading, because farmers in the chain do not add any value to grapes at the farm level. Also, it was found that harvesting, preliminary sorting, grading, storage and standardisation of the produce were done by traders who earn net profit of 15 per cent. Therefore, creation of a mechanism for forward contract was suggested to allow farmers to add value and sell grapes directly to consumers.

The study by Lei Deng *et al.* (2016) assessed table grape supply chain performance in China. The findings for that study revealed that despite receiving the highest proportion of total net profit and making the highest value creation, vine growers are facing fluctuating and uncertain commercial returns due to production and market risks, fluctuation of farm-gate price and the buyer dominant relationship with wholesalers. Although the model is profitable to all key actors, but table grape supply chain still faces several challenges including unorganised and dispersed production systems, power asymmetry and lack of information sharing. All these are the barriers to the improvement of the whole chain performance and the long-term sustainability of this important industry. Ntale's *et al.* (2014) study on indicators of value-added agri-businesses on small farms in Kenya viewed that Kenya's agrarian economy is suffering from limited value addition as the statistics show that 6% of small farmers add value to their agricultural produce. It was discovered that farm sizes negatively correlated with value addition. Instead, the distance to the market and accessibility to loan facilities were found to be the major determinants of value addition

in Kenya. The study recommended that the government should create rural markets for the farmers and facilitate financial institutions to lend money to small farmers at reasonable interest rates.

A survey by Kulwijila *et al.* (2018) on grape value chain mapping in Dodoma Region, Tanzania indicated that the key actors in grape value chain were input suppliers, producers, processors, wholesalers, retailers and consumers. However, the relationship among actors was very weak because no farmers and traders' associations were identified. Constraints along the value chain that contribute to grape losses were high production and transport costs, poor extension services, limited access to marketing information, inadequate market access, lack of credit, poor knowledge on postharvest handling, poor roads, inappropriate post-harvest technologies and spoilage of the commodity. The study recommended on the provision of extension services, credit facilities and establishment of grape board which could oversee marketing of grapes to reduce problems associated with low grape selling price to growers.

Mlay (2021) examined marketing challenges along grapes value chain in central areas of Tanzania. The study findings revealed that grape grower farmers had limited knowledge and skills to tap the market opportunities. The study recommended on collective action among grapes growers to enable them to dictate the market. The empirical reviewed studies show that studies on grapes value chain have been conducted. However, scant attention has been given to participation of smallholder farmer on grapes value addition. Furthermore, scholars rarely moderate uncertain determinants and benefits of smallholder farmers' participation in value chain. Unfortunately, most of the aforementioned studies used qualitative descriptive statistics which is weak in establishing causal effect relationship. And most of which based on sample size of less than 150 respondents, thus, generalization of the findings becomes deficient. These demanded for broad study with the intention of establishing empirical evidence to inform all stakeholders in grapes production. This study is an important step to filling this gap on participation of smallholder farmers on grape value addition in Dodoma Tanzania.

#### **4. Research Methodology**

The study was conducted in the Dodoma City jurisdiction because it is the major grape production city in Tanzania. The presence of many grape farmers in the city makes it an interesting area to examine the existence of value addition activities done among smallholder farmers. Both qualitative and quantitative data were collected and analysed to get a wider insight of research. Shah and Al-Bargi (2013) asserted that critical research needs adoption of qualitative and quantitative study to get different perspectives of research. A Cross-sectional Research Design was used whereby respondents were interviewed only once (Draugalis, *et al.* 2008). The design was chosen to allow collection and analysis of data in a relatively short time with consideration of time limitations and the available resources for carrying out the study.

The population of this study was the smallholder grape farmers in Dodoma, Tanzania specifically in Mpunguzi and Hombolo wards. These two wards were chosen because they are leading grapes cultivating areas in Dodoma. The sample size of 229 respondents to be involved in this study was drawn through Slovin's formula (Stephanie, 2003). The formula states that  $n=N/(1+Ne^2)$  whereby n stands for sample size, N stands for population of respondents and e is the level of precision (0.0025). The formula is used when population is known and not exceeding 100 000. Therefore, this study adopted this formula since the population of the study is known and was less than 100 000. Smallholder grape farmers were selected using simple random sampling technique whereas purposive sampling technique was used in selecting extension officers who believed to have specific information concerning the topics of this study. Primary data for this study were collected through survey, interview and focus group discussion (FGD) methods. The survey method was done by administering structured questionnaire to smallholder farmers in the study area whereas interview method was used to gather information from two extension officers. Additionally, Focus Group Discussion (FGD) with ten (10) smallholder farmers who engaged in cultivation of grapes was conducted. The FGD was conducted to complement information gathered through questionnaire and interview on farmers' participation in grapes value addition. Secondary data were collected from documents such as grapes farmers' records available in Dodoma municipal office, web-based information related to the study and various literatures.

The collected quantitative and qualitative data were analysed using profitability analysis. A Gross Margin Analysis was used to analyse the benefits associated with smallholder farmers' participation in adding value to grapes basing on the following profitability equation.

$$\text{Profit} = \text{Revenue} - \text{Total Costs or } \pi = Y_i P_i - VC_i - FC_i$$

Where,

- $Y_i$  = Quantity of outputs
- $P_i$  = Price of a commodity
- $VC_i$  = Variable cost
- $FC_i$  = Fixed Cost

## 5. Findings and Discussion

Questionnaire was administered to 180 out of 229 respondents. The 49 respondents failed to fill questionnaire due to many factors including timing. This resulted in a response rate of 79% and only 21% did not. Draugalis *et al.* (2008) stated that a study with response rate of 50% and above does not face a response bias challenge unlike a study that achieves 30% or 20% response rate. Similarly, Saldivar (2012) declared that a response rate is considered good if is at least 50%, 60% above good, and 70% very good.

### 5.1 Awareness of value addition

Findings in Table 1 show that 171 respondents (95%) were aware of grape value addition and only 5% were not aware of grape value addition. This indicates that the majority of grape farmers in the study area were aware of value addition practices. This finding implies that most farmers were in the position to practice value addition because they had idea of what it means. It was assumed that farmers who were knowledgeable of the technology expected to adopt faster than those who were not.

**Table 1: Awareness of value addition**

| Category                    | Frequency  | Percent (%)  |
|-----------------------------|------------|--------------|
| Aware of value addition     | 171        | 95.0         |
| Not aware of value addition | 9          | 5.0          |
| <b>Total</b>                | <b>180</b> | <b>100.0</b> |

### 5.2 Engagement and experience of farmers in value addition

Out of 180 farmers who participated in this study, 43.3% were engaged in value addition at different levels. Table 2 shows that the majority of farmers (55%) participated in value addition had experience of less than 5 years, while only 45% had experience of above 5 years. This implies that grape value addition practice was still evolving. Thus, more extension service support to help farmers adopt value addition practices was highly required. This might be due to the fact that value addition practice was a new phenomenon and most farmers exerted their effort on selling raw produce and leave non-farmers to engage in value addition practices.

**Table 2: Engagement and experience of grape farmers in value addition**

| Category                            | Frequency  | Percent (%)  |
|-------------------------------------|------------|--------------|
| Not engage in value addition        | 102        | 56.7         |
| Engage in value addition            | 78         | 43.3         |
| <b>Total</b>                        | <b>180</b> | <b>100.0</b> |
| <b>Experience in value addition</b> |            |              |
| < 5 years                           | 99         | 55.0         |
| > 5 years                           | 81         | 45.0         |
| <b>Total</b>                        | <b>180</b> | <b>100.0</b> |

### 5.3 Forms of value addition

In order to assess forms of value addition practiced among grape smallholder farmers in the study area, a 5-point Likert scale was used. 5 points for strongly Agree, 4 points for agree 3 points for neutral, 2 points for Disagree and 1 point for strongly disagree. A decision rule of thumb was that, mean rated of 3.0 and

above be accepted as forms of value addition used, while a mean rated below 3.0 regarded as not significant and not a form value addition used. In this regard, different types of value addition practices were used including preparation of raisins, wine, bulk wine, juice, packaging and sorting. Table 3 gives the details of this observation.

From Table 3 the results indicate that raisins, wines and bulk wine scored above the mean score. Mean score for raisins was higher (4.0) compared to other forms of value addition followed by preparation of wine (3.9) and preparation of bulk wine (3.2). This implies that raisins, wine, and bulk wine are the major value addition forms practiced by farmers in the study area. The reason was to avoid the risk of grapes rotting but furthermore for storage purposes. Wine produced by smallholder farmers can be mainly for local consumption and to some extent for sale. Farmers who produce bulk wine normally do so to sale to beverage industries that use it as raw materials for production of wine (MRA, 2017). The results in Table 3 further indicate that grading, production of vinegar/syrup; packaging and use of quality input scored less than the minimum score of 3.0. This indicates that these forms of value addition were not much practiced among smallholder grape farmers, which could be due to low technology used by farmers or expenses associated with the process that hinder participation in these forms of value addition. This is contrary to Mohite, (2017) findings who studied marketing management of grapes in Dhule District in India. The study revealed that farmers are facing the problem of marketing their grapes due to costly packing materials that hinder higher returns hence less participation in value addition activities.

During FGD with smallholder farmers it was discovered that grading is practiced mostly by grape wholesalers who sort and sell grapes at higher price and earn maximum profit compared to farmers. Grading is also practiced by traders mostly from other parts of Tanzania and from other countries like Kenya as they did that on their own after purchasing at farm gate. As the mean score was very close to minimum score to be considered as significant value addition practiced, the researcher may qualify this as one among the value addition practices but at small or moderate extent. Similarly, Bayani (2011) in the study of post-harvest factors influencing quality of table grapes in Afghanistan found out that customers/traders were responsible for sourcing the labour for sorting and packing grapes, where the labourers were paid by the exporters who buy grapes.

**Table 3: Forms of grape value addition**

| Forms of value addition | Score percentage on Likert scale |      |    |      |    |      |    |      |    |      |       |
|-------------------------|----------------------------------|------|----|------|----|------|----|------|----|------|-------|
|                         | 1                                |      | 2  |      | 3  |      | 4  |      | 5  |      | Mean  |
|                         | F                                | %    | F  | %    | F  | %    | F  | %    | F  | %    | Score |
| Grape drying            | 8                                | 5.0  | 14 | 8.0  | 4  | 6.0  | 97 | 54.4 | 54 | 30   | 4.0   |
| Wine production         | 36                               | 20   | 33 | 18.3 | 18 | 10   | 47 | 26.1 | 46 | 25.6 | 3.2   |
| vinegar/syrup           | 98                               | 54.4 | 56 | 31.1 | 19 | 14.5 | -- | --   | -- | --   | 1.7   |
| Packaging               | 09                               | 05   | 91 | 50.6 | 19 | 10.6 | 43 | 23.8 | 18 | 10   | 2.8   |
| Grading                 | 32                               | 17.7 | 37 | 36.7 | 28 | 15.6 | 66 | 20.6 | 17 | 9.4  | 2.9   |
| Quality inputs          | 31                               | 17.2 | 40 | 22.2 | 22 | 12.2 | 73 | 40.6 | 14 | 7.8  | 2.9   |
| Juice making            | 51                               | 28.3 | 99 | 55   | 18 | 10   | 12 | 6.7  | -- | --   | 1.9   |
| Bulk wine production    | --                               | --   | 22 | 12.2 | 27 | 15   | 76 | 42.2 | 55 | 30.6 | 3.9   |

## 5.4 Benefits of value addition

### 5.4.1 Profitability analysis of grape farming

It was deemed important to know the profit margin without any form of value addition and profit margin in each form of value addition. The initial costs for grape vine production was excluded from the analysis due to nature of grape reaping, because after planting grape vine tree, it is reaped many times for a period of more than 10 years. Thus, the current researcher used subsequent expenses incurred by smallholder farmers such as subsequent fertilizers, pesticides expenses and weeding expenses. The profit margin was calculated from the equation that, Profit ( $\pi$ ) = Revenue (sales) – Total variable costs (VC). After realising the profit margin before value addition, the researcher ascertained profit margin for each form of value addition.

#### 5.4.2 Profit margin without any form of value addition

The findings shown in Table 4 indicate that, the subsequent costs for one year per 1 acre were as follows: weeding expenses, TZS 480 000, manure TZS. 120 000, pesticides expenses TZS. 450 000, cutting expenses TZS. 110 000, trailing expenses TZS. 210 000 and harvesting expenses TZS. 160 000, making a total of TZS. 2 010 000. Initial farm cost preparation was TZS. 3 560 000 where the grand total cost for grape farming was TZS. 5 570 000. The grape gestation period was 3 years but for the sake of this study, the researcher assumed cost for one year in order to ascertain estimate of total cost per one year and compare it with the total revenue per one year.

**Table 4: Grape cost analysis**

| Activity                                    | Description          | Unit | Quantity | Unit costs<br>TZS | Amount (TZS)     |
|---------------------------------------------|----------------------|------|----------|-------------------|------------------|
| <b>Weeding</b>                              | 4 times per year     | Acre | 1        | 120000            | 480000           |
| <b>Manure</b>                               | Once per year        | Acre | 1        | 120000            | 120000           |
| <b>Pesticides</b>                           | 4 times per season   | Acre | 1        | 112500            | 450000           |
| <b>Cutting</b>                              | 2 times per year     | Acre | 1        | 55000             | 110000           |
| <b>Trailing</b>                             | Continuous           | Acre | 1        | 210000            | 210000           |
| <b>Harvesting</b>                           | Two times per year   | Acre | 2        | 80000             | 160000           |
| <b>Add: Contingent costs and own labour</b> | 30% of variable cost | Acre | 1        | 480000            | 480000           |
| Total average cost                          |                      |      |          |                   | <b>2 010 000</b> |
| <b>Add: Initial cost</b>                    | Farm preparation     | Acre | 1        | 3 560 000         | 3 560 000        |
| Total cost with initial cost                |                      |      |          |                   | <b>5 570 000</b> |

Smallholder grape producers incur different costs during production process. The majority of smallholder producers incurred cost of land clearing which is above TZS. 100 000 as shown in Table 4. Similarly, more than a half (60%) of respondents incurred the cultivation cost which was above TZS. 250 000 and planting cost which was above TZS. 201 000. Moreover, the fertilizer application cost, the majority of respondents incurred the cost above TZS.150 000 per acre and in case of pruning, the majority incurred the cost below TZS. 60 000.

#### 5.4.3 Grapes profitability analysis

The study made profitability analysis by finding the differences between the total revenue (annual sales) and total costs. However, the year 3 total cost includes subsequent costs for year 1, 2 and 3. The results in Table 5 shows that, the total average yielding per year was 5.5 tons each sold at average price of TZS. 1 000 per kilogram which make a total revenue of TZS. 5 500 000. The total cost including initial cost for farm preparation was TZS. 9 590 000 and total cost excluding initial cost was TZS. 6 030 000 in year 3. The results show that, in year 3 which was the first harvesting year, the total net loss including initial cost was TZS. 4 090 000 which was equivalent to margin of 74.4% and net loss excluding total initial cost was TZS. 530 000, equivalent to 9.6% margin. This means that, the smallholder grape farmers do not earn profit in year 1, 2 and 3 even after excluding initial costs for farm preparation. This was because the average subsequent cost of TZS. 2 010 000 from first year to third year were included in net profit computation. This implies that smallholder grape farmers do not earn profit for the first three years of growing grape vine consecutively.

Moreover, in year 4 the findings show that, net loss including initial cost was TZS. 600 000 loss margin and net profit excluding initial costs was TZS. 2 960 000 equivalent to a profit margin of 53.8% as shown in Table 5. This means that smallholder grape farmers start earning profit by excluding initial cost in fourth year while if they include initial cost, they still incur net loss of TZS. 600 000 equivalent to 10.9%. This implies that smallholder framers may make breakeven point after four years since commencement of grape farming.

Furthermore, the findings in year 5 revealed that, the net profit including initial cost was TZS. 2 890 000 and net profit excluding initial cost was TZS. 3 490 000. This means that, smallholder grape farmers meet breakeven point at year five (ability to meet both total fixed cost and total variable cost). The initial cost of TZS. 600 000 was completed in this year and remains enough profit margins for smallholder grape farmers. Lastly, in year 5, there was no initial cost due, only subsequent cost of TZS. 2 010 000 was deducted from total sales of TZS. 5 500 000 which made a net profit of TZS. 3 490 000 the profit margin of 63.5% is expected to be constant profit margin fetched by smallholder grape farmers for next 5 years before replanting existing grape trees with new ones.

**Table 5: Profitability analysis**

| Activity                                                 | Year 3      | Margin | Year 4      | Margin | Year 5      | Margin | Year 6    | Margin |
|----------------------------------------------------------|-------------|--------|-------------|--------|-------------|--------|-----------|--------|
| <b>Revenue (sales)</b>                                   | 5 500 000   |        | 5 500 000   |        | 5 500 000   |        | 5 500 000 |        |
| <b>Total cost after 3 years (including initial cost)</b> | (9 590 000) |        | (6 100 000) |        | (2 610 000) |        | ----      |        |
| <b>Net Profit/loss</b>                                   | (4 090 000) | 74.4%  | (600 000)   | 10.9%  | 2 890 000   | 52.5%  | ----      | ----   |
| <b>Total cost (excluding initial cost)</b>               | 6 030 000   |        | 2 540 000   |        | 2 010 000   |        | 2 010 000 |        |
| <b>Net profit/loss</b>                                   | (530 000)   | 9.6%   | 2 960 000   | 53.8%  | 3 490 000   | 63.5%  | 3 490 000 | 63.5%  |

\*\*\*Year 3 costs include 1, 2 and 3 year costs\*\*\*

These findings were similar to those by MRA (2017) who analysed the trend of price of grapes in Dodoma and discovered that the price of grapes in Dodoma tend to vary between TZS.500 and TZS. 1000 per one kilogram. The findings indicated that more than a half (54.3%) of respondents sold their grape on price ranging between TZS. 501 and 800 with an average of 1,470 kilograms sold. Furthermore, it was noted that, the price of grapes was fluctuating from season to season depending on harvest and availability of buyers.

#### 5.4.4 Profitability associated with value addition

The researcher aimed to ascertain the profit margin in each form of grape value addition and findings is presented in Table 6. Starting with raisin, the results show that, it adds average cost of TZS. 6 000, average market price is TZS. 10 000 ranging from maximum of TZS. 12 000 to the minimum price of TZS. 8 000 and profit margin of TZS. 4 000. This means that raisins form of value addition fetches profit margin of 40% more than a farmer could fetch if he sells grapes at farm gate price of TZS. 1 200 per kilogram. This implies that the raisin form of grape value addition adds profit margin to a great extent compared to farm gate price. However, most of smallholder farmers who participated in value addition undertake this form of value addition compared to any other form due to its high profitability margin and provide option for them timing of high price season.

Bulk wine results show that, it added an average cost of 1 800 per kg, average market price of TZS 2 000 per litre ranging from TZS 2 500 to TZS 1 600 with profit margin of TZS 200. This means that bulky wine fetches profit margin of 10% more than the farm gate profit margin. This means that if smallholder farmers could get involved in bulky wine form of value addition, they could earn extra profit of 10% of the profit margin. Some smallholder farmers seemed to involve in this kind of value addition probably due to low cost associated with it and readily available market for bulk wine. The implication of this is that bulk wine adds about 10% more than the farm gate profit margin.

Furthermore, the results about packaging as detailed indicated in Table 6 show that average cost per kilogram was TZS 2 000, market price TZS 2 200 ranging from TZS 2 500 to TZS 1 650 and profit margin of TZS 200. This means that, if smallholder grape farmers could involve in packing form of value addition, they could add 9% of profit margin than the farm gate profit margin. Therefore, implication of this result

is that packing and packaging add more profit margins. Thus, smallholder farmers should be encouraged to practice packaging.

Concerning grading/sorting of grapes, the findings shown in Table 6 indicate that grading adds an average cost of TZS 1 000, fetching average market price of TZS 1 100 ranging from 800 to 1 200 and adds profit margin of 100. This means that, smallholder grape farmers could earn more profit margins of 9% after sorting grapes into different quality grades i.e., grade 1, 2 and 3. This implies that, sorting of grapes also adds more profit margin than selling grapes which are not sorted.

**Table 6: Value addition margin**

| Type of cost   | Mean cost | Mean market price | Maximum price | Minimum price | Margin |
|----------------|-----------|-------------------|---------------|---------------|--------|
| Raisins/kg     | 6000      | 10000             | 12,000        | 8000          | 4000   |
| Bulky wine     | 1800      | 2000              | 2500          | 1600          | 200    |
| Packaging      | 2000      | 2200              | 2500          | 1650          | 200    |
| Grading        | 1000      | 1100              | 1200          | 800           | 100    |
| Quality inputs | 1000      | 1200              | 1500          | 800           | 200    |
| Juicy          | ---       | ---               | ---           | ---           | ---    |
| Vinegar/syrup  | ---       | ---               | ---           | ---           | ---    |

Furthermore, about use of quality inputs, the findings provided in Table 6 revealed that, quality inputs add average costs of TZS 1 000 per kg, fetching average market price of TZS 1 200 ranging from TZS 800 to TZS 1 500 and earn profit margin of TZS 200. This means that smallholder grape farmers could earn highest profit margin of 16.7% more than farm gate profit margin. Hence, if the smallholder grape farmers could use quality seed, right pesticides, sufficient fertilizers and more grape tree care, they could add more 16.7% profit margin than the farm gate profit margin. This is true due to the fact that, smallholder grape farmers were unable to use modern inputs for grape vine production due to low capital as these modern inputs are very costly. During interview, one grape farmer said:

... If farmers can use modern and quality inputs such as fertilizer and pesticides, they can earn more than 8 tons per 1 acre. They fail to use quality inputs due to lack of sufficient capital as it needs more than TZS 10 million to produce one acre through using quality inputs...(21<sup>st</sup>April,2019, Dodoma City).

This statement means that, if smallholder grape farmers had support with enough capital to use quality inputs in the production process including quality seeds, fertilizers and pesticides, they would have received maxim profit at high extent.

## 6. Conclusions and Recommendations

This study found that the most common forms of value addition practiced were processing of grapes into raisins and the processing of bulk wine. However, farmers also participated to small extent in processing wines for local use, packing, grading and quality input form of value addition. Yet farmers did not participate in processing grapes into juice and vinegar/syrup. The study revealed that there were benefits associated with smallholder farmers' participation in adding value to grapes. All forms of value addition were found to add more profit to smallholder farmers when practiced. The most profitable form was found to be raisins, followed by bulk wine, and the least was grading and packing. It is therefore concluded that small holder farmers who participated in any form of grape value addition could generate profit compared to selling at the farm with the farm gate price. It is therefore necessary for smallholder grape farmers to be given extension service support and emphasised on value addition activities in order to generate more profit and enhance their capabilities.

Since drying of grapes, production of bulk wine and local wine were found to be the most forms of value addition that were practised by smallholder farmers, it is recommended that smallholder grape farmers should also extend their practice to other forms of value addition including grading, packing, processing

of vinegar/syrup, juice, and usage of quality inputs. Diversification of value addition practices can help farmers enhance the level of value addition and eventually win the grape market. In addition, extension service for farmers should be improved. The extension officers should be trained to help farmers on how to handle grapes from farm level to value addition activities in order to upgrade their knowledge and skills to provide adequate extension services. Nevertheless, value addition technology and knowledge development required farmers' involvement. Farmers should be encouraged to participate in order to perfect scientific and informal approaches in respective forms of value addition. This would have facilitated attaining more profiting grape cultivation.

## References

- Bayani, M.A. 2011. Pre- and post-harvest factors influencing quality of table grapes in Bagram district, Parwan. Unpublished M.A. Dissertation. Parwan: University of Applied Science Wegeningen.
- Birthal, P. S., Awadhesh, K. J., and Harvinder, S. (2007). Linking Farmers to Markets for High value Agricultural Commodities. *Agricultural Economics Research*, 20(3): 425-439.
- Blau, P. M. (1964). Exchange and power in social life. Piscataway, NJ: Transaction publishers.
- Chervin, C., Aked, J., Crisosto, H, C. (2012). Crop Post-Harvest: Science and Technology–Perishables. In D. Rees, G. Farrell and J. Orchard. *Chichester, Experimental Agriculture*, 48(4), 601-602.London: Wiley-Blackwell.
- Creasy, G., and Creasy, L. (2018). *Grapes*. London: CAB International.
- Deng, L., Ruimei, W., Tian, D., Jianying, F. and Weisong, M. (2016). Assessing the table grape supply chain performance in China a value chain analysis perspective. *British Journal*, 5(118): 1129-1145. DOI: [org/10.1108/BJFJ-09-2015-0310](https://doi.org/10.1108/BJFJ-09-2015-0310).
- Dodoma Municipal Council (2016). Annual Performance Report. Dodoma: Dodoma Municipal Council.
- Draugalis, J. R, Coons S, J. and Plaza, C.M. (2008). Best practices for Survey Research Reports. A synopsis for authors and Reviewers. *American Journal of Pharmaceutical Education*, (1)72: 11-23.
- Fleming, K. (2005). Value-added strategies: taking agricultural products to the next level. *Journal of Agribusiness*, 16:1-2.
- Gashaw, B., A., Habteyesus, D., G., Nedjo, Z., S. (2018). Determinants of Coffee Value Addition by Smallholder Farmers in Jimma Zone, Ethiopia. *The International Journal of Business Management and Technology*, 2(4):112-123.
- Homans, G. C. (1961). Social Behaviour. *American Journal of Sociology*, 63(6): 597-606.
- IOV. (2017). International organisation of vine and wine report on World Viti viniculture Situation. Annual Report of the OIV Statistical Report on World Viti viniculture Paris.
- Kalimang`asi, N., Majula, R. and Kalimang`asi, N. N. (2014). The Economic Analysis of the Smallholders Grape Production and Marketing in Dodoma Municipal: A case study of Hombolo Ward. *International Journal of Scientific and Research Publications*,4(10): 2250-3153.
- Kirimi, L., Sitko, N., Jayne, T.S., Karin, F., Muyanga, M., Sheahan, M. and Bor, G. (2011). A Farm Gate-to-Consumer Value Chain Analysis of Kenya's Maize Marketing System. *Food Security International Development Working Papers*, 10(11): 25-37. DOI: [10.22004/ag.econ.101172](https://doi.org/10.22004/ag.econ.101172).
- Kulwijila, M., Makindara, J., and Laswai, H. (2018). Grape value chain mapping in Dodoma region, Tanzania. *Journal of Economics and Sustainable Development*, 9(2), 171-182.
- Mbugi, E. (2020). Determinants of economic efficiency among smallholder Common beans farmers in Igamba and Itaka divisions in Mbozi district, Songwe region. Unpublished Doctoral Thesis. Morogoro: Sokoine University of Agriculture.
- Mlay, F. F. (2021). Understanding Marketing Challenges along Grapes Value Chain in Central Areas of Tanzania. *The Accountancy and Business Review*, 13(1): 1-7.
- Mohite, V.S. (2017). Marketing management of grapes in Dhule district, India. <https://krishikosh.egranth.ac.in/handle/1/5810039308>.
- Mpore, J.F. (2013). Nutrient content, microbial quality and sensory acceptability of sun and solar dried raisins from Dodoma region. Unpublished Master's Dissertation. Morogoro: Sokoine University of Agriculture.
- MRA, (2017). *The report on horticultural value chain analysis*. Dodoma: MRA.

- Ntale, J. F, Litondo, K. O. and Mphande, O. M. (2014). Indicators of Value-Added Agri-Businesses on Small Farms in Kenya: An Empirical Study of Kiambu and Murang'a Counties. *Journal of Small Business and Entrepreneurship Development*, 2(3): 89-101. DOI: [10.15640/jsbed.v2n3-4a6](https://doi.org/10.15640/jsbed.v2n3-4a6).
- Roy, R., Shivamurthy, M., Rama, B., and Radhakrishna, B. R. (2013). Impact of Value Addition Training on Participants of Farmers Training Institutes. *World Applied Sciences Journal*, 22 (10): 1401-1411.
- Rwelamira, J. (2015, October). Strengthening farmers' organizations and civil society organizations. In Paper for Feeding Africa Conference.
- Shah, S. R., and Al-Bargi, A. (2013). Research Paradigms: Researchers' Worldviews, Theoretical Frameworks and Study Designs. *Arab World English Journal*, 4(4): 252-264.
- Stephanie, E. (2003). Slovin's Formula Sampling Techniques. New York: Houghton-Mifflin
- Sullivan, C. (2012). Farm Wineries. *Legislative Analyst*, 6(1): 296-5047.
- Tara, P. (2011). Value chain analysis of grapes in Nandi Valley of Karnataka. Unpublished Master's Dissertation. Bangalore: University of Agricultural Sciences.
- Tasevska, G.M (2012). Efficiency analysis of commercial grape-producing family farms in the Republic of Macedonia. Unpublished Doctoral Thesis. Uppsala: Swedish University of Agricultural Sciences.
- Thibaut, J.W., and Kelley, H. H. (1959). *The social psychology of groups*. New York: John Wiley and sons.
- Thippanna, K. S., Shwetha, M. K., Naik, B. K. and Srinivas, N. (2016). Economics of processing and marketing of different value-added products of grapes in north Karnataka. *International Journal of Commerce and Business Manager*, 9(2):169-174. DOI: [10.15740/HAS/IJICBM/9.2/169-174](https://doi.org/10.15740/HAS/IJICBM/9.2/169-174).
- URT (2015). *Tanzania Agricultural Sector Development Strategy II 2015/2016 – 2024/2025*. Dar es Salaam: Ministry of Agriculture.
- Vink, N. (2019). The South African Wine Industry. In *The Palgrave Handbook of Wine Industry Economics* (pp. 201-223). London: Palgrave Macmillan.