

## Research Paper

# Opportunities and Challenges of Pineapple Smallholder Farmers in Improving Rural Livelihoods: A Case Study of Donge Village in Zanzibar

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**Abstract**— The paper examined the benefits resulting from the production of pineapple among smallholder farmers in Donge village in Zanzibar. A case study research design was important in generating data out of 40 smallholder farmers using a mixed approach. Questionnaire survey, focus group discussion facilitated the gaining of the data on the problem. It was found that there are opportunities resulting from the growing of pineapple mostly enjoyed by youths in the study area that call for the attention to deal with the parallel challenges influencing an effective production among smallholders. It was found that smallholder farmers benefit in the form of livelihood improvement in the day to day lives depending on the pineapples. The evidence was seen in enabling members of the community to have the capacity to own modern houses, means of transport, and cellular phones among other essentials of needs. There was evidence of the high level of influence of the challenges on pineapple farming involving pineapple production that include access to markets, cost of inputs and transportation and cost of labour. It was concluded that there are opportunities in the production of pineapple that require the attention to handle the resulting challenges of markets, transport, and cost of inputs. It was recommended that attention should be called upon dealing with the systematic challenges that influence the ability of smallholder farmers to maximise the potential opportunities and enjoyable socio-economic benefits of pineapple farming in the area.

**Keywords**— Challenges, Donge Village, Opportunities, Pineapple, and, Smallholders

## 1. Introduction

The global number one agenda for sustainable development seeks to end poverty in all its forms everywhere with strategies to reduce at least by half the proportion of men and women and children of all ages living in poverty in all dimensions and according to national definitions [1]. This requires multidimensional strategies to deal with spatial, social and economic inequalities in improving rural livelihoods. Pineapple (*Ananas comosus*) is a delicious tropical fruit with a fine flavour and high nutritive value. It is one of the most important commercial fruit crops in the world. It is the third most important tropical fruit after banana and mango [2]. Globally, the pineapple has possessed a market share of global export of 0.01% at the rank of 66th. ([www.tridge.com](http://www.tridge.com)). Costa Rica is the largest producer of pineapple 12%, followed by Brazil and the Philippines 10% [3].

## 2. Related Works

According to [4] pineapple has become the fastest-selling fruit in the United Kingdoms with the sell increasing by 15% in 2017 which leads to the increase of the supplier of pineapple to Europe and the United States of America. But the sell value of

pineapples has been declined since 2008 that 43% to 32% in 2017, this seemed to be the challenge. Reference [5] indicates that in India pineapple smallholders face the problem of bio-waste management, post-harvest management and value addition however, their pineapple specific training support to stakeholders and the opportunity of industry support, research, and development support, and a well-established and organized farmers association [6].

In Africa, Nigeria is recognized as the main producer, followed by South Africa [7]. According to [8], in East Africa, Kenya and Rwanda are the largest producers of pineapples (40%) followed by Tanzania (19%). Uganda produces only 1% of total pineapple in the region (Fit Uganda Ltd, 2007). The Tanzania development vision 2025 aspires to realise a high-quality livelihood [9]. This requires the fight against the state of multidimensional poverty with special measures to deal with rural livelihoods. Tanzania is ranked 18th in the list of top 20 pineapples producing countries [3]. Annual pineapple consumption in Tanzania is approximately 214 840 tons [10]. In Tanzania, the crop is mostly grown in Bagamoyo, Kibaha, Geita, Mwanza, Tanga, Mtwara, Lindi, Zanzibar, and other areas with minor production [11]. This position is influenced by many challenges like poor storage facilities and lack of financial support [12]. There are appropriate technologies in

post-harvesting, and marketing (Samson, 2007). In terms of opportunities [12] has tried to train and develop smallholder farmers of pineapple in Tanzania. Again, the government in partnership with the World Bank injected resources into pineapple production so as to improve the level of development of pineapple production in Tanzania. According to [13], Unguja Island is the main producer compared to Pemba Island. In Unguja Island the pineapple is mostly grown in Machui in Central District and in Donge Constituency in North 'B' District. Specifically, the area marks one of the largest pineapple-producing Districts in Zanzibar. In fact, all Shehia in Donge is the producers of pineapple including Donge Mtambile, Donge Vijibweni, Donge Karange, Donge Kitaruni, Donge Mbiji, and Donge Mnyimbi are producing areas of pineapple in the district. According to the available statistics, the annual production of pineapple in Zanzibar over the last five years was 1,787.45 tons and had been categorized as follows; (1500.00 Tons 2013), (1858.98 Tons 2014), (1892.76 Tons 2015), (1743.00 Tons 2016) and (1942.50 Tons 2017) [13]. Also the pineapple production in Zanzibar have a lot of challenges for smallholders like investment issue, market and poor transportation challenges despite the Revolutionary Government of Zanzibar initiating and carrying out of a range of agricultural programs and projects to address key challenges. These efforts were like plant protection, capacity building, and farmers' empowerment, irrigation, and water management. There are several factors used to push smallholder farmers to increase crop production, address challenges encountered by them, and build their capacity to tap the existing opportunities. But the problem of the adoption of improved agronomic practices in fruit production including pineapple production is still low in Zanzibar. This makes the persistence of challenges in the study area leading to the thinking on the sources of the problem. Again, the rural areas still face greater challenges in relation to poverty conditions than it is for urban areas calling the consistent need to examine the main livelihood dependable occupation, particularly pineapple in the study area.

### 3. Theory

The paper employed the Industrial location theory by [14] in understanding the opportunities and challenges of pineapple smallholders. The theory attempts to address three important factors related to industrial development. These factors include the location of an industry in relation to sources of raw materials, markets for the potential goods or services in relation to the cost to be incurred. The theory's relevance to the pineapple smallholders rests in the fact that the distances from farming land to the markets have cost implications, so does the distance to access agricultural inputs required in the management of pineapple farms. However, the theory does not take into consideration other factors eclectically such as a change in government policies and naturally induced factors like drought. The Overall objective of the paper was to examine the basis of opportunities and challenges that affect pineapple smallholder farmers in the study area.

### 4. Methodology

The paper presents results based on the study that was conducted in Zanzibar particularly in the Donge village North "B" district Zanzibar Tanzania. The area was selected because is one of the famous pineapple-producing areas in Zanzibar. The population comprised all smallholder farmers of the village within the district, government agricultural officials at the district and ministerial level in Zanzibar because of being informative on pineapples. The study was a case study in design that adopted a mixed research approach to allow the investigation of the problem in extent and breadth.

Sampling procedures involved a selection of a total of three villages that were selected in the district. About 40 smallholder farmers were randomly selected. The key informants were purposively selected to involve government officials due to their role as agricultural officers at the district and central government levels. Primary data are those [15]. data that are collected afresh and for the first time, and thus happen to be original in character. In this study the primary data that were used are observation, focus group discussion as well as key informant interview so as to gather original information from the respondents. The quantitative data were collected using a household questionnaire survey. The questionnaires were formulated with open and close-ended questions. The in-depth approach was used to administer the questionnaire to the selected respondents. The qualitative data were collected using Key informant interviews, Focus group discussions, and field observation methods. In collecting the qualitative data using these methods, a checklist for observation methods, Focus Group Discussion (FGD) guide, and an interview guide were used in guiding the data collection exercise. These methods were applied in order to triangulate what was collected during the household questionnaire survey. There were two FGD comprising two categories namely, FGD for smallholder farmers for pineapples, and village leaders each group contained 12 participants both females and males. Secondary data involved documentary review focused on areas like agricultural policies and procedures, reports on related agricultural matters especially pineapple production books, articles, and journals so as to obtain the validity and reliability of data. Qualitative data were analyzed through content analysis. These were data gathered by interviews, Focus Group Discussions, and documentary review. The quantitative data were analysed using descriptive statistics where frequency distribution tables were tabulated using Statistical package for social sciences. The weighted mean scores were calculated to get the level of influence of target variables on smallholder farmers in the study areas.

### 5. Results and Discussion

This section presents results on the paper. It discusses the characteristics of respondents. These included sex, age, and marital status. Another relevant characteristic of pineapple smallholders is the level of education of study participants. Another area is the presentation and discussion of the results focusing on the benefits accrued from pineapple smallholders as well as the related challenges that influence the

improvement in livelihoods of pineapple smallholders in the area.

### 5.1. Sex

The paper examined the sex categories of the respondents as presented in Table 1. It was found that the majority of respondents were 29 (72.5%) males while 11 (27.5%) were females as depicted in Table 1.

**Table 1: Respondents' characteristics (N=40)**

Characteristics		%
Sex	Male	72.5
	Female	27.5
	<b>Total</b>	<b>100</b>
Age	Youths	67.5
	Adults	25.0
	Elders	7.5
	<b>Total</b>	<b>100</b>
Marital status	Single	57.5
	Married	42.5
	<b>Total</b>	<b>100</b>
Education	None	15.0
	Primary	27.5
	Education	
	Secondary	47.5
	Education	
	Certificate	10.0
	<b>Total</b>	<b>100</b>

The findings indicate that the number of males outweighed the number of females. This indicates that there was unbalanced gender-informed participation of both sexes in pineapple smallholdings in the study area. Men occupy better representation in the production of pineapples and they are in a position to be more beneficiaries of pineapple than women. They are also in the likely worse situation of experiencing challenges in the subsector. The results further mean that women have been in a position to engage in farming pineapple, the position that puts them behind the livelihood strategies in the area.

### 5.2 Age

The researchers have also looked at the age of the respondents so as to know the exact group which is engaged mostly in pineapple production. Table 1 presents the results which indicate that the 18-35 years group of youths were 27 (67.5%), adults ranged from 36-60 were 10 (25. %), Elders with 61 years and above were 3 (7.5%). Researchers observed that the population age distribution of the area under study was mainly dominated by youths. The results meant that majority of the respondents had an age ranging from 18-35 years which are the most potential to receive benefits and any likely challenges associated with pineapple production. This was justifiable due to having the majority of youths in Tanzania a working population.

### 5.3 Marital status

The study also focused on the marital status of the respondents. This was conducted because of helping the research to access how pineapple farming activities help families towards livelihoods improvement among the married, single, separated, divorced, and widow individuals. Table 1 presents the results on the marital status. The results obtained showed that 17 (42.5%) respondents were married

while 23 (57.5%) respondents were single in marital status. This indicates that the majority of people engaged in pineapple production were single in marital status which indicates the participation of youths in agriculture in the study area through their families.

### 5.4 Educational levels

The results in Table 1 indicate that most of the respondents 19 (47.5%) had a secondary level of education. These were followed by the 11 (27.5 %) respondents with a Primary school level of education while only 4 (10%) respondents had a certificate level of education. Since most of the respondents had secondary and primary level of education, this implies that majority of the farmers do not get access to higher education. For that matter, they are likely to get challenges in pineapple production. This means that they have a low-level understanding about pineapple production despite their experiences. One farmer responded: *"In fact, we need agricultural education and training in order to improve smallholder farmers who are uneducated and employed who employ themselves in agricultural sectors so as to promote national income and welfare of the people"* (Focus Group Discussion, 2019). The education variable is an important attribution facilitating the high level of knowledge and experience about improved farm practices acquired by the educated farmer. This helps to influence the major decisions being taken in the home, and farm management inclusive. The status of education among stallholder farmers is an indicator of difficulties in the production of pineapple reflected through low-level of mastery of the production environment among others factors.

### 5.2 Benefits of Pineapple Farming

The paper examined the benefits obtained by pineapple smallholders who were examined so as to know the extent of benefits they receive economically in livelihoods promotion. Table 2 and Box 1 present the results on whether or not they get benefits and the typical benefits accrued.

**Table 2: Benefits of Pineapple Farming (N=40)**

Responses	%
Neutral	37.5
Agree	12.5
Strongly Agree	50.0
<b>Total</b>	<b>100</b>

Table 2 presents the results obtained from the respondents on the experience of the benefits of pineapple production in their daily life. The results indicated that most of them were strongly benefiting from pineapple production accounting for 20 (50%). Other 15 (37.5%) were moderately benefiting from pineapple production and some 5 (12.5%) had agreed being benefiting in an ordinary manner from pineapple production. This combination of results mean that there are some benefits resulting from pineapple production in the study area as well as some challenges associated with pineapple production value chain that limit the improvement of farmers' livelihoods. These results tally with the Industrial location theory that premised on the consideration of necessary factors that promote benefits and without which one is likely to encounter some challenges. Box 1 presents

results on the benefits of pineapple smallholders in the study area.

#### Box 1: Benefits of Pineapple to Smallholders

It was revealed that there are benefits resulting from pineapple farming including youths' dependence on pineapple farming as an activity for their livelihoods. As a result, the main economic activity of the area is pineapple cultivation that enables the acquisition of properties like construction of housing, school, food, clothing, and means of transport like motorcycles, cars, and bicycles. Others stated that with pineapple cultivation they could be able to acquire cellular phones. Being the main activities is dependent on stimulating population growth as a source capital for other economic services like kiosks, local markets, and shops (FGD, 2018).

The focus group discussion indicated the existence of benefits acquired from the engagement in the production of pineapple. These were the promotion of day-to-day life through pineapple activities of cultivation, management, and selling which in turn yield financial benefits for properties like housing, means of transport, and communication facilities. According to the interview with respondents it was reported that there are direct benefits resulting from the participation of smallholder farmers in the study area. These involved the direct employment of youth. It was found that the majority of male youths are employed directly as smallholder farmers in the area. Another benefit resulting from pineapple farming is its contribution to the establishment of housing by the majority of farmers engaged in pineapple farming. Given its pineapple investment, the area marks one of the most influential rural settings in the cultivation of pineapples.

#### 5.3 Individual Level of Influence of Challenges to Pineapple Smallholders

In the case of individual challenges the paper revealed that 31 (77.5%) of participants of the study responded with very high agreement on being experiencing individual challenges, 8 (20%) of participants responded with a high level of agreement on the experience of the challenges and 1 (2.5%) responded with a moderate level of experience of the challenges. Table 3 presents the level of influence of the individual challenges. This shows that majority of the pineapple farmers are faced with individual challenges in the production of pineapples.

**Table 3: Nature and Influence of Challenges on Pineapple Smallholders**

Nature of Challenge	Weight	Influence	Interpretation
Systematic factors that influence pineapple production	475	4.8	Very high level
Individual factors that influence pineapple production	475	4.8	Very high level

**Note:** Influence is shown as 1-1.4 means Very low, 1.5-2.4 means Low, and 2.5-3.4 means Moderate, 3.5-4.4 mean High and 4.5-5 means Very high

#### 5.4 Level of Influence of Systematic Challenges to Pineapple Smallholders

This section presents the results on the level of influence of systematic challenges associated with pineapple stallholders as presented in Table 4. The results indicated that there are various systematic challenges influencing smallholder farmers in Donge village. These challenges have a high ranking in terms of their influence on smallholders' ability to benefit from the production of pineapples.

**Table 4 Challenges Experienced by Pineapple Smallholders**

S/N	Challenges	Weight	Influence	Influence Interpretation
1	Availability of inputs	400	4.0	High level
2	Market	437.5	4.4	High level
3	Transport	427.5	4.3	High level
4	Labour cost	427.5	4.3	High level
5	Input cost	400	4.0	High level

**Note:** Influence is shown as 1-1.4 means Very low, 1.5-2.4 means Low, 2.5-3.4 means Moderate, 3.5-4.4 mean High and 4.5-5 means Very high

These results are linked to the challenges faced by agribusiness in Abuja whereby there is no government layout specifically for urban farming despite its potentials. Thus, establishing explicit policy for pineapple due to its importance is crucial [17].

##### 1) i. Availability of Inputs

The results presented in Table 4 shows that 40 (100%) of total respondents faced inputs availability challenge indicating the high level of influence on pineapple production. This implied that the smallholder farmers of pineapple have a poor and insufficient budget for buying their inputs that facilitate agricultural activity. According to [16] found out the major constraint is the lack of improved varieties and input for production. This is much relevant to the industrial location that points out the issue of raw materials as one of the materials required in the production process.

##### 5.4.1 The Challenge of Market

Table 4 shows that the challenges of markets were strongly agreed by 35 (87.5%) respondents, while only 2 (5%) agreed and the 3 (7.5%) respondents were neutral. The results indicate a high level of influence of the market as a challenge in influencing negatively the pineapple production in the area. These results concur with the theory of industrial location that underscores the essence of consideration of market and efficient transport cost in order to maximize benefits.

##### 5.4.2 The Transport Challenges

Table 4 indicates that 27 (27.5%) of the respondents strongly agreed about the existence of this challenge. One (2.5%) respondent agreed on being experience a challenge of transport in the production of pineapples. Ten (10) (25%) of respondents were neutral regarding the experience of transport as a challenge affecting their production process. Two (2) (5%) of respondents strongly disagreed the experience of transport challenges. According to the industrial location theory transport costs, consideration in

locating production facilities is one of the essential factors that facilitate agricultural activities. For that matter, the existence of a high level of transport cost signifies the underrating of the transport constant that results in negative impacts to pineapple smallholders.

#### 5.4.3 Cost of Labour and Inputs

Table 4 shows that cost for labor and inputs is one of the challenges affecting farmers. The results revealed that 2 (60%) strongly agreed with the existence of the challenge. Only 5 (12.5%) respondents agreed on experiencing the cost of labour and inputs whereas 10 (25%) respondents were neutral and 1 (2.5%) respondent strongly disagreed on being experiencing the challenge. The results indicate a high level of influence of cost of labour and input in limiting pineapple farmers' ability to benefit from the production process. The results implied that majority of farmers were faced with the issue of labour cost and even inputs as one among respondent said "they used to make agreement between them and people of Nyamwezi tribe to help them during crops production because family labour are insufficient and then to be paid after harvesting and selling. This can create a conflict by not given their money due to the loss by the low price, poor production, and many distractions. The results also state the same as the industrial location theory that considers the cost of transportation from sources of raw materials to the markets and production costs.

According to the Focus Group Discussions, their many challenges experienced by smallholder farmers in the production of pineapples. These involve the availability of fertilizers for pineapple smallholders. One of the participants in expressing the view of many participants on the influence of the challenge said that "fertilizers availability is a huge challenge since it is the stimulator of another challenge such as poor production. Also, they insisted that when they ask for it they were told by the local leaders that the fertilizers obtained were for other crops like rice and not for pineapples. One of the respondents in the focus group discussion also said that "They get it with the high price of 80,000 Tanzanian shillings per "sack" which leads to get insufficient fertilizers that can help lowly in obtaining good results of what they produce".

The results are linked to the challenges of agriculture in Zambia that articulate that lack of investment in ultra-modern machinery in agriculture leads to the sector to contribute 'peanuts' to development [18].

#### 5.4.4 Pests and Insects

The study area also experiences pests, rats, birds, and ants that destroy crops. The pests and ants are used to eat the pineapple trees and the roots associated with the soils. This leads to pineapple dying before they grow up. Also, birds and rats are eating the ripped pineapples and leads to destroy and damage hence, affecting the quality of produces. One respondent said".

*"We are used to putting toxic medicine in the ripped pineapples so as to kill the rats and birds and that medicine is very toxic and harmful for human life but in case of ants, we*

*have no way to do since the problem is within the soil"* (Focus group discussion, 2019).

These results indicate that pineapple smallholder farmers are faced with a lot of challenges that are embedded within the production value chain that entail the understanding of their nature of production process, availability and transportation of inputs, marketing of produces, and their capacity as per industrial location theory's contentions. These challenges deter livelihood improvement among pineapple stallholders in the area.

## 6. Conclusion and Future Scope

The paper examined the opportunities and challenges that influence smallholder farmers. It explored the level of influence of challenges being experienced by smallholder farmers. The paper concludes that smallholder farmers were benefiting from the participation in pineapple production in the area. The benefits range from individual property acquisition to livelihoods in the area. Pineapple is the most dependable crop among the Donge community. However, there are challenges associated with the crop that requires attention. These involve individual and systematic challenges. The individual challenges revolve around the incapacity of smallholders to own capital and enough land resources. The systematic challenges are associated with a limited market, price, transport, training, and the availability of inputs to facilitate the production, marketing, and transportation of produces. Therefore, it was concluded that there benefits from the participation in pineapple farming in the area that provides for enhanced opportunities. However, there are challenges that require attention. The paper recommends the improvement of smallholders' abilities to realize their efforts and contribution towards economic development and livelihoods promotion. This can be done by facilitating the provision of inputs, capacity enabling and access to specialised nearby local and international markets for the products.

#### Data Availability

None

#### Conflict of Interest

Authors declare that they do not have any conflict of interest to the paper.

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None

#### Authors' Contributions

Author one contributed in the data gathering process involving secondary and primary data for this work. Author two provided overall guidance and complementary inputs to the secondary data particularly literature review, analysis, and drafting and writing contributions of the work. The second author also contributed in organization, reporting and editing of the paper for final submission.

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