

**YOUTH EMPLOYMENT IN AGRICULTURE AND LIVELIHOOD OUTCOMES
IN TANZANIA: A CASE OF VEGETABLE FARMERS IN DODOMA CITY**

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**A THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY IN AGRICULTURAL AND RURAL
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MOROGORO, TANZANIA.**

EXTENDED ABSTRACT

This study determined the contribution of vegetable farming to livelihood outcomes among the youth in Dodoma city, Tanzania. Specifically, the study analyzed the strategies used by the youth in vegetable farming; examined the influence of livelihood outcomes on youths' perception towards vegetable farming; and assessed the contribution of vegetable farming to livelihood outcomes among youth. The study was conducted in Ihumwa and Mtumba wards in Dodoma city. The study employed a case study and cross-sectional research designs whereby a mixed methods research approach was adopted. The approach enables the collection of both quantitative and qualitative data and then integrates the information in the interpretation of the overall results. Qualitative data were collected through in-depth interviews, focus group discussions (FGDs) and key informants interviews (KIIs). Quantitative data were collected using an interview schedule. Content analysis was used to analyse qualitative data and this was informed by Interpretative Phenomenological Approach (IPA). On the other hand, descriptive statistical analysis, Likert scale, chi-square, correlation analysis and ordinal logistic regression model were used to analyse quantitative data by using IBM SPSS. The current study revealed that production and marketing strategies are interlinked in such a way that production strategies are conditioned by market opportunities. This is reflected in youth engaging in production of crops which needed low investment mainly in order to minimize the risks associated with marketing. Timing in crop production, producing crops which are beyond the youth farmers comfort zone and beyond the production of traditional crops for market targets were important strategies associated with youths' success in vegetable farming. However, working under limited resources, compelled some youths to venture into survival strategies such as producing under rain-fed conditions and the use of poor farming tools e.g buckets for watering vegetable garden. The present study shows that the quick return nature of the vegetable farming influenced the youth to think positively about the enterprise. This was confirmed by the chi-square

findings which revealed a statistically significant association ($\chi^2 = 138.0$ df = 4; $p = 0.007$) between different categories of livelihood outcomes and youth perceptions toward vegetable farming. Likewise the results from correlation analysis show a significant and positive association between livelihood outcome and youths' perception toward vegetable farming ($r = 0.507$; $p = 0.000$). Implicitly, youth perception towards farming cannot be generalized but linked to the enterprise which the youth are engaged in. Generally, more than half (58.4%) of the youth vegetable farmers were categorised into high livelihood outcomes. However, a weak impact of vegetable farming was observed on human and social network indicators. The analysis shows that even a small increase in farming skills can contribute significantly to production and productivity as 61 percent of the youth who did not attend any training fell into low livelihood category. Implicitly, improvement in the livelihood outcomes of the youth vegetable farmer can only be achieved by expanding land under cultivation. Ordinal logistic regression results indicated that access to credits, level of education and farm size had significant influence ($p < 0.05$) on the livelihood outcomes achieved by the youth vegetable farmers. The study concludes that, while vegetable farming could be an essential enterprise for improving the livelihood of the youth, some challenges that need concerted efforts remain. These challenges include encouraging the youth to work in viable farmer groups which could make them to be easily trained while at the same time marketing larger volumes. Thus, improving their access to bulk buyers and hence increased collective and individual profit. However the formation of farmer's group should consider farmers who have established themselves as farmers already for commitment purposes. Moreover, identification of high-value vegetable and niche markets for the crop is a key area that needs further consideration. The government in collaborations with the youth and other development partners is, therefore, urged to address these issues when designing intervention measures for improving the livelihoods of youth in farming.

DECLARATION

I, ANNA ENOCK MASELLE, do hereby declare to the Senate of Sokoine University of Agriculture that this thesis is my own original work, done within the period of registration and that it has neither been submitted nor is being concurrently submitted at any other institution for award of any degree.

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DEDICATION

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LIST OF ABBREVIATIONS AND ACRONYMS

AGRA	Alliance for a Green Revolution in Africa
ANSAF	Agricultural Non-State Actors Forum
ASDP	Agricultural Sector Development Programme
DADP	District Agricultural Development Projects
DFID	Department for International Development
FAO	Food and Agricultural Organization of the United Nations
FO	Farmer’s Organization
IFAD	International Fund for Agriculture Development
ILO	International Labor Organization
LOI	Livelihood Outcome Index
LS	Livelihood Strategy
NBS	National Bureau of Statistics
NSYIA	National Strategy for Youth Involvement in Agriculture
OLM	Ordinal Logistic Model
SCCT	Social Cognitive Career theory
SDG	Sustainable Development Goals
SLF	Sustainable Livelihood Framework
SUGECO	Sokoine University Graduate Enterprise Cooperative
TAHA	Tanzania Agriculture Horticultural Association
TYIC	Tanzania Youth Investment Club
UDOM	University of Dodoma
UNDP	United Nations Development Programme
URT	United Republic of Tanzania

CHAPTER ONE

1.0 GENERAL INTRODUCTION

1.1 Youth and Agriculture in Africa

Agriculture remains the major sector of the African economy that supports the livelihoods of 70-80% of workers (United Republic of Tanzania (URT), 2016; Food and Agricultural Organization of the United Nations (FAO), 2014; Brooks *et al.*, 2013). However, Africa is the region of the world where lack of livelihood opportunities for the youth remains a serious concern (Bezu and Holden, 2015; International Labor Organization, 2013; Mahendra and Venkatanarayana, 2011). About 60-70 percent of the total population in Africa is under the age of 35 with the unemployment rate estimated at 12% (AGRA, 2015; Proctor, 2012; Leavy and Smith, 2010). The United Nations (UN) defines youth as people from the ages 15 to 24 years, while the African Union (AU) defines youth or young people as every person between the ages of 15 and 35 years. The National Youth Development Policy of Tanzania (2007) shares the same view with the African Youth charter. Therefore, for the purpose of this paper, the broader definition by the African Union is retained, with the term youth including the group of young people, male and female, married or single, from age 15 to 35 years.

Besides, the wage sector of employment where most youth seek employment cannot absorb the large number of job seekers estimated to be between 10 to 12 million per year (Alliance for a Green Revolution in Africa (AGRA) 2015; International Labour Organisation (ILO), 2013). In Tanzania, the youth account for 67 per cent of the labour force and in each year, 900 000 young Tanzanians enter the job market which generates only 50 000 to 60 000 new jobs (United Republic of Tanzania (URT, 2016).

Evidently, there are few viable alternatives to agriculture especially given the many African small and poorly performing industrial sectors (FAO, 2013). It has, therefore, been strongly argued that, in many African countries, only the agricultural sector has sufficient scale and growth-linkages to significantly provide employment and sustainable livelihood for the youth (Agricultural Non-State Actors Forum, ANSAF, 2016; Brooks *et al.*, 2013; Diao *et al.*, 2010). In this particular context, the employment challenge in Africa is not just one of creating jobs in the wage sector, but of creating productive livelihood activities for the youth in agriculture.

1.2 Youth and Vegetable Farming

Inadequate farming resources such as land, water for irrigation as well as negative perception and belief that farming is characterized by drudgery and minimal financial returns have been the reasons for youths' aversion to farming (Njeru, 2017; Noorani, 2015; Charles, 2014). However, evidence shows that the youth are attracted to the production of fast-maturing crops such as vegetable and fruits in order to make quick money to meet the desires of their lives (Rutta, 2012). This means that the horticulture sector can be attractive to the youth because cash can be generated in a short period of time and even from small pieces of land; hence, from this form of agriculture, a decent livelihood can be secured (Rai *et al.*, 2019; Gurung *et al.*, 2016; Proctor *et al.*, 2012). Moreover, combined with cost-effective strategies, vegetable farming can generate more and sustainable job opportunities for the youth since it is labour intensive (Juma *et al.*, 2015). Some scholars have gone even further contending that vegetable farming can be practised profitably at both large and small scale levels mainly because it requires little water for irrigation, its market is readily available and chances of crop failure are almost none (Mariyono, 2018; Bhatta and Doppler, 2016).

1.3 Strategies to Engage the Youth in Agriculture

Agriculture in Sub-Saharan Africa represents more than just the ability to grow food. It sustains livelihoods through employment for the youth and wealth creation, and also becomes the locus of new social organisations (growers associations etc) (Wangwe, 2015). However, agriculture is not glamorous. It suffers from entrenched negative perceptions. In the minds of many African youths, a farmer is someone like their parents, doing backbreaking labour in the fields and getting little to show for it (Noorani, 2015). Hence, to provide conducive environment for the youth to engage in agriculture a number of strategies have been put in place. These include the AGRA (2015) effort to mobilise farmers' organisations in 14 countries, train on fertilizer micro-dosing and give youth farmers market access and bargaining power for their produce.

To harness the potential of the agriculture sector in providing employment for the youth, the government of Tanzania has made efforts to attract the youth to take up employment in agriculture. For example, the *Kilimo Kwanza* (URT, 2009), whose 8th pillar is science, technology and human resources. The strategy aimed at providing agricultural loans and land to entrepreneurial agricultural graduates so as to retain youths in agriculture. Also, the Sokoine University Graduate Enterprise Cooperative (SUGECO) was established in 2011 to equip its members with skills to write feasible business plans on agribusiness projects in order to access loans and credit facilities from financial institutions. This enables them to run small viable and profitable agricultural projects as their full time-jobs. Similarly, the National Agriculture Policy of 2013 underscores the importance of facilitating access to productive resources including labour-saving technologies, surveyed land and irrigation infrastructure for the youth (URT, 2013).

These efforts are also reflected in the 2016-2021 National Strategy for Youth Involvement in Agriculture which emphasizes on promoting decent livelihood for the youth in the agricultural sector. These initiatives have had a considerable impact as a large number of the youth have engaged in all kinds of income-generating activities in agriculture, particularly vegetable farming (Anania, 2016; Wangwe, 2015; Gulamiwa, 2015; FAO, 2013; Njenga *et al.*, 2012; Rutta, 2012).

1.4 Problem Statement and Justification for the Study

In recent years there has been a growing literature about youth in agriculture. Some previous studies on youth employment in agriculture include studies by Giuliani *et al.* (2017), Ayele *et al.* (2017), Mutua *et al.* (2017), Anania (2016) and Rutta (2012). These studies have focused on youth employment in agriculture versus perception and aspirations, policy, factors influencing youth participation in agriculture and type of crops produced, respectively. While the aforementioned studies have concentrated on factors affecting youths' participation in agriculture, limited scholarly attention has been paid to their engagement horticulture especially vegetable farming and associated livelihood outcomes. This study, therefore, contributes to the body of knowledge by providing empirical evidence on the livelihood outcomes of the youth who have established their livelihood as vegetable farmers in Ihumwa and Mtumba wards, Dodoma City.

To fill the above mentioned knowledge gap, the study analysed the strategies used by the youth in vegetable farming, explored the behavioral-related factors by examining the youths' perception towards the enterprise and the contribution of vegetable farming to their livelihood outcomes. This is critical because perception has an impact on the way youth act and organize their farming while the strategies used have direct implications on youths' livelihood outcomes and on the emerging visions of agriculture as an employment solution

for the youths. Thus, this study provides useful information to youths in their understanding of how their actions may impact their livelihood outcomes and what factors affect their livelihood outcomes in the vegetable business. Also, to the policy makers and development partners, the findings will help them in developing appropriate and effective strategies for supporting sustainable livelihoods of the youths engaged in agriculture. Moreover, the study addresses NSYIA 2016-2021 which aims at facilitating and building capacity of the youths for self-employment and realization of the Sustainable Development Goals (SDG) number 8.6 which emphasizes on reducing the proportion of those youths who are not in employment, education or training by 2020”.

1.5 Objectives of the Study

1.5.1 Overall objective of the study

The overall objective of this study was to determine the influence of vegetable farming on the livelihood outcomes of the youth in Ihumwa and Mtumba wards, Dodoma City in Tanzania.

1.5.2 Specific objectives

The specific objectives of the study were to:

- i. Analyse the strategies involved in vegetable farming among the youth in Ihumwa and Mtumba wards.
- ii. Examine youths’ perception towards vegetable farming in relation to their livelihood outcomes in Ihumwa and Mtumba wards.
- iii. Measure the levels of livelihood outcomes and their determinants among the youths engaged in vegetable farming in Ihumwa and Mtumba.
- iv. Assess the contribution of vegetable farming to livelihood outcomes among the youths in Ihumwa and Mtumba wards.

1.6 Research Questions

This study addressed the following research questions:

- i. How is vegetable farming organized among the youth in Dodoma?
- ii. What are the strategies employed by the youth in vegetable farming?
- iii. What determines the choice of strategies employed by the youth vegetable farmers?
- iv. How is vegetable farming perceived among the youth vegetable farmers?
- v. How do the livelihood outcomes achieved through farming influence the youth perception towards the sector?
- vi. To what extent does vegetable farming contribute to the livelihood outcomes of the youth?
- vii. What are the factors contributing to the livelihood outcomes levels achieved by the youth?

1.7 Theoretical Frameworks

This study is guided by the sustainable livelihood framework (SLF) and the Social Cognitive Career Theory (SCCT). Theoretical triangulation involves the use of more than one theoretical framework in the interpretation of the data (Yeasmin and Khan, 2012). Triangulation is mainly used for confirmatory and for completeness purposes. As a confirmatory approach, triangulation' can overcome challenges related to a single-method, single-observer and single-theory biasness and thus can be applied to confirm the research results and conclusions. For completeness purposes, researchers use triangulation to increase their in-depth and understanding of the phenomenon under investigation by combining multiple theories (Yeasmin and Khan, 2012). However, triangulation can neither bridge paradigm nor provide facts but allows for recognition of multiple realities deepening and widening one's understanding (Yeasmin and Khan, 2012). For this reason a careful approach of triangulation is recommended in the verification of the conclusion. In the current study therefore, although the SLF provided a comprehensive structure for achieving the goal of this study, which involved examining how the youth chose the

strategies they used in vegetable farming and what guided their choices and the extent to which vegetable farming contributed to their livelihood outcomes, it does not offer the grounds for analyzing the influence of perception. This necessitated the use of social cognitive career theory in this study.

Hence, the social cognitive career theory guided the analysis of youth perception towards vegetable farming in relation to their livelihood outcomes. This is owing to the fact that, although the SLF emphasizes on the importance of access to assets for the successful pursuit of livelihood strategies to attain livelihood priorities, it is ill-equipped to deal with perception analysis. Hence, youth perceptions toward vegetable farming are explained through the SCCT.

1.7.1 Sustainable livelihoods framework

This study used the Department for International Development sustainable livelihood framework (DFID, 1999) (Fig. 1.1) because of its holistic analytical nature. Using the Department for International Development's (DFID's) SLF (Fig. 1.2) as a key reference, the study modified the assets-institutions-livelihood strategy-outcome relationship and centred on the relationship between vegetable production and marketing strategies- livelihood assets- livelihood outcomes-perceptions as shown in Fig. 1.2.

Generally, the heart of SLF has been a link between asset – livelihood strategies – livelihood outcomes. Assets interact with policies, institutions and processes to shape the choice of livelihood strategies and, these in turn, shape the livelihood outcomes. According to Ashley and Carney (1999), DfID (1999) and Scoone (1998), SLF maintains individuals and households as the focus of analysis. This means SLF is people-centred in a direct sense and depends upon the involvement of those meant to be helped by change

(Bennett, 2010). This is both a principled and practical stance as it is hard to imagine being able to carry out a SLF without the involvement of these people (Scoones, 1998). This provides opportunities for community-based learning where people can learn from each other as well as from outsiders. According to Carney (2002), the SLF is credited as underpinning the success of major national and multi-national development approaches and research methodology. As such, with the use of the SLF, some of the poor's main livelihood assets will be determined including among others the education level, financial security and social capital.

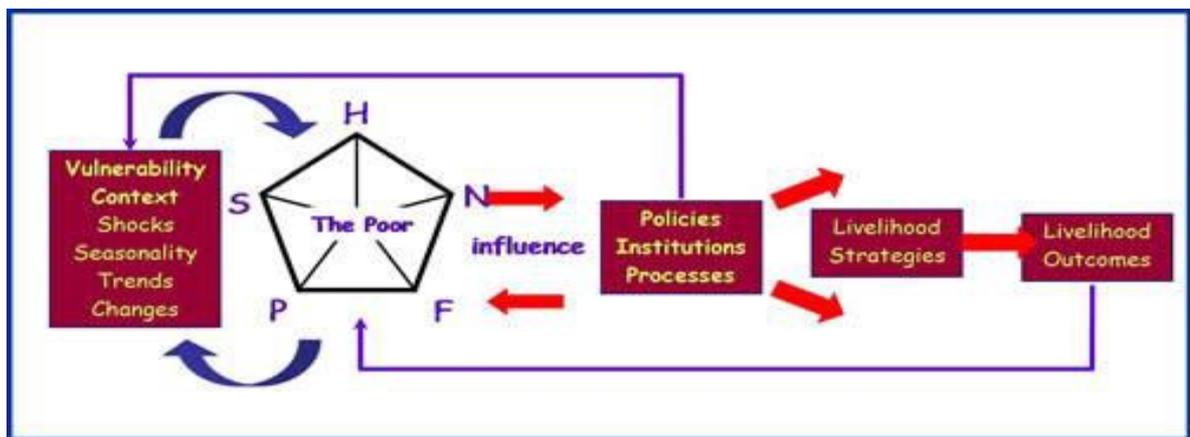


Figure 1.1: Department for International Development Sustainable Livelihood Framework, Source: (IFAD, 2011)

Key: S=social capital, P = Physical capital, F – Financial capital, N =natural resource base, H =human resource

Nevertheless, SLF just like any other frameworks and theories has had its critics. For example, Morse *et al.* (2009) argued that it is unclear how to analyse and measure capitals within SLF. The pentagon in Fig. 1.1 is a neat representation of important asset groups but each could contain many elements. However, the questions that arise are: How are these elements to be assessed? Is it necessary for all of them to be measured? If the latter can be done, then how can one determine which one should be assessed? Obviously, there is an element of context specificity here, but at least superficially it might seem straightforward. Another concern is on the importance of trust. Sustainable Livelihood Framework is reliant

upon the participation of those at the centre of the analysis but asset ownership can be sensitive for all sorts of reasons.

Furthermore, it would not be surprising if households withhold information if the questions raise some suspicions in the respondents; thus, making them to potentially distort the outcome of the SLF. Despite the criticisms, a number of agencies and scholars such as the United Nations Development Programme (UNDP) and Food and Agriculture Organization of the United Nations (FAO) have adopted the approach in operationalizing sustainable livelihood frameworks to suit their goals. For example, Mchopa and Jeckoniah (2018) assessed the livelihood outcomes of smallholder sunflower growers in Iramba district, Tanzania. Machimu (2017) also used the framework to analyse the livelihood outcomes of smallholder sugarcane outgrowers in Morogoro Region, Tanzania. In 1993, Oxfam employed the SLF in formulating its overall aims, improving project strategies and staff training through encouraging participation (Neefjes, 2000).

Furthermore, CARE improved the framework in 1994 to include cultural relations to fit its need to address gender issues in its efforts to achieve household livelihoods security in relief and development work. The UNDP also adopted the SLF to serve as both the conceptual and programming framework for poverty reduction (Helmore and Singh, 2001). Hence, the use of the SLF in this study provided a better understanding of how vegetable farming affects the livelihoods of the youth in Dodoma City. Equally important, the framework also helped us to determine how the youths' livelihoods are carved out through vegetable farming which is reflected in livelihood outcomes. Based on this framework, it is assumed that unemployment, as one of the vulnerability situation, triggers the youths to engage in vegetable farming (livelihood strategy (LS)). However, those sufficiently endowed with assets are more likely to be able to attain high livelihood outcomes (Carney,

1998). Implicitly, they can choose from a range of options in order to maximize their achievement of livelihoods rather than being forced into any given strategy as the only option. It is, therefore, theorized that the ability of the youth to pursue a meaningful livelihood strategies depends on their assets endowment and their ability (in terms of socio-demographic characteristics) to combine them (Borras *et al.*, 2011).

Literature (see for example Lyatuu and Urassa, 2015) underscores the influence of socio-demographic characteristics such as period of being in business, household head's age, sex, education level, land size and land ownership status. Nevertheless, the youth endure different scales of exposure to the institutions and policies that condition the environment in which they operate. This determines their farming strategies, their perception towards the sector and the consequent differences in welfare outcomes. It is imperative to note that the heart of the SLF is sufficient for the current study's analysis. However, the analysis of policies and institutions is beyond the scope of this thesis. Moreover, despite the significance of the SLF in analyzing how livelihoods could be achieved through livelihood strategy and their determinant factors, it does not offer the grounds for analyzing the influence of perception. This necessitated the use of social cognitive career theory in this study.

1.7.2 The Social Cognitive Career Theory (SCCT)

The theory focuses on three cognitive personal variables namely self-efficacy, outcome expectations and goals. Lent *et al.* (1994) has postulated that through continued activity, exposure, practice, and feedback, people refine their skills, develop personal performance standards, form a sense of their efficacy in particular tasks, and acquire certain expectations about the outcomes of activity engagement. Outcome expectations refer to beliefs about the consequences or outcomes of performing particular activities (e.g., what will happen if I do

this?). The choices that people make about the activities in which they will engage in as well as their efforts and persistence in these activities entail consideration of outcomes. For example, people are more likely to choose to engage in an activity that they see their involvement as leading to valued, positive outcomes such as social and self-approval, tangible rewards and attractive work conditions. Therefore, positive outcomes lead to positive perception towards the activity and desired attitudinal change. The theory is applied to this study in that it serves as interplay between livelihood outcomes and youth perception towards vegetable farming. As such, youths' negative or positive perception towards vegetable production is influenced by the livelihood outcomes achieved.

1.8 Conceptual Framework

The study's conceptual framework (Fig. 1.2) is informed by the above mentioned theories and the reviewed empirical literature in this study. Figure 1.2 illustrates the link between vegetable farming as a livelihood strategy, production and marketing strategies involved in vegetable farming, livelihood assets and selected household socio-economic characteristics (the independent variables) and the livelihood outcomes and perceptions which are the dependent variables. The study presupposes that youths' livelihood outcomes in vegetable farming is hindered or enhanced by production and marketing strategies, livelihood assets and socio-economic factors. For instance, youth good strategies to access finances for use as working capital are most likely to attain high livelihood outcomes as this may result in expanding their businesses through improved technologies and enhanced farming skills which contribute to improved production and productivity. However, the choice of these strategies is dictated by the livelihood assets possessed by the youths.

The study also hypothesized that attainment of a high level of livelihood outcomes enhances positive perception towards vegetable farming. According to the social cognitive

career theory positive outcomes lead to positive perception towards the activity and desired attitudinal change (Lent *et al.*, 1991). Moreover, low levels of livelihood outcomes enhance negative perception towards the enterprise as farmers' behaviour is shaped by what they perceive would be the impacts of the livelihood strategy on their livelihoods and this in turn, affects their livelihood strategy and livelihood outcomes. The study also assumed those socio-economic characteristics presented in Fig. 1.2, have a significant influence on the youths' ability to attain high livelihood outcomes. For example, women in Tanzania lack security of access to land due to traditional gender relations compared to men who stand a better chance of attaining high livelihood outcomes in the business since they can easily access land.

Furthermore, to better understand how youths' livelihood is carved out through vegetable farming, it was important to understand the strategies employed in farming as shown in Chapter 2. The rationale for this was based on the fact that, strategies employed in farming determines the livelihood outcomes to be attained. The information is useful in informing what farming strategies are essential in improving youths' livelihoods and what assets are highly influential. This is crucial in understanding the mechanisms that enable some youths to improve their livelihoods through vegetable farming and the factors that may instead limit them.

After analysing the strategies used by the youth in vegetable farming, it was important to determine the general perception of the youth towards vegetable farming and to find out whether perception towards the enterprise is the same across categories of livelihood outcome as shown in Chapter 3. The central assumption was that, low livelihood outcomes achieved through vegetable farming had a negative bearing on the youths' perception towards the sector and livelihood outcomes attained through farming vary across the

enterprise. This information is important since changing youths' perception of farming is a major target in improving the livelihood of the youth and reducing unemployment by engaging them in agricultural-related activities (URT, 2016). The study also hypothesized that, apart from strategies and perceptions, social and economic factors are likely to influence levels of livelihood outcomes achieved by the youth through vegetable farming. To address this, the study sought to answer the following question: What factors determine youths' livelihood outcomes in vegetable farming? (Chapter 4). The information is important to policy-makers and the youth in the planning and improvement of interventions aimed at enhancing youth livelihoods through farming.

In this study, therefore, high livelihood outcome level is expected to happen when there is an increase in household income as a result of engagement by the youth in vegetable farming, improvements in household assets, human and social capital and food security. Furthermore, livelihood outcomes are also expected to bring effect on youths' perception towards vegetable farming.

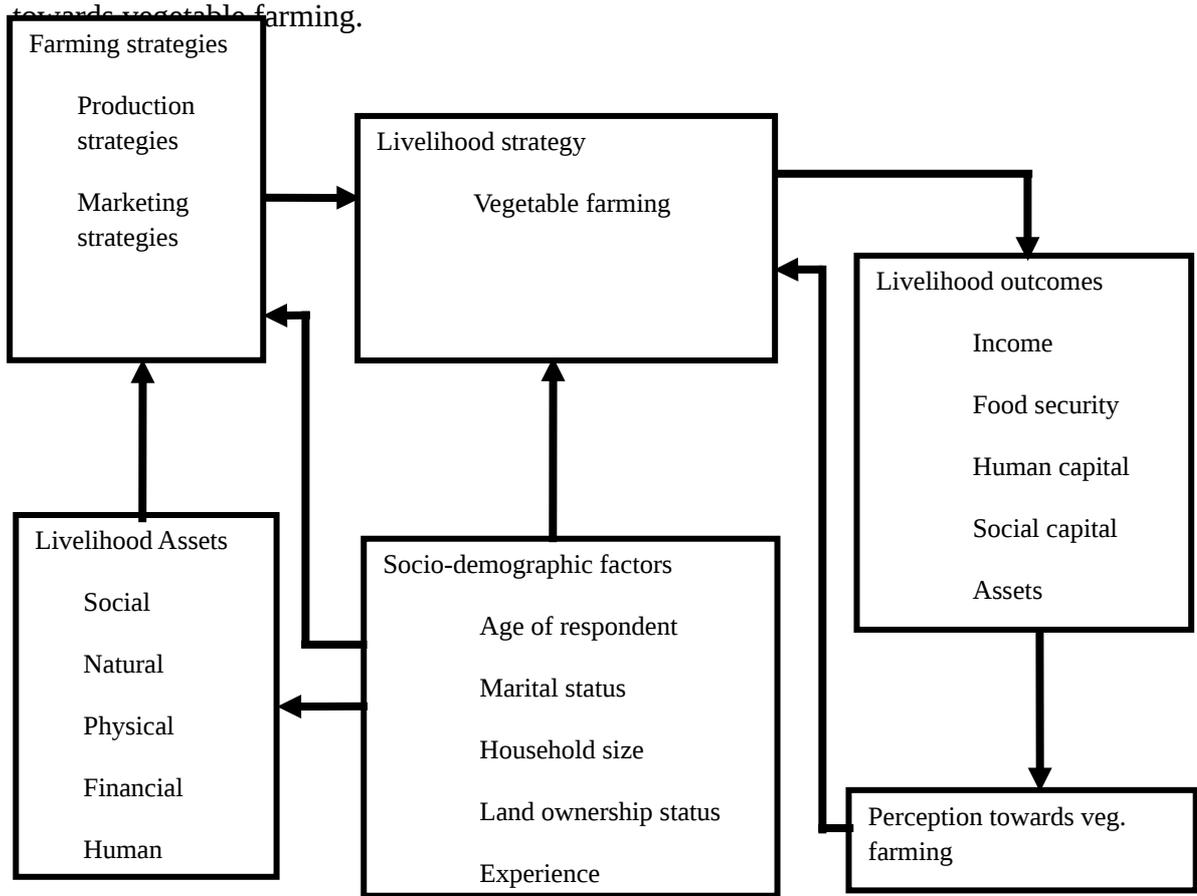


Figure 1.2: Conceptual framework adapted from DFID (1999)

1.9 General Methodology

1.9.1 Study area

This study was conducted in Ihumwa and Mtumba wards, Dodoma City. A map of Dodoma showing the location of the wards where the study was conducted is presented in Fig. 1.3. Ihumwa and Mtumba are among the six wards (Ihumwa, Msalato, Veyula, Mtumba, Mpunguzi, Hombolo) in Dodoma City where vegetable farming intensively done. Two wards were purposively selected for the study because they are the most prominent areas in vegetable production in the City. Dodoma is a semi-arid region characterized by a long dry season starting late April to early December, and a short single rainy season starting in December to mid-April. The average rainfall is 500mm annually, and about 85% of the rain is recorded in the four months between December and March (Agriculture Census, 2014). Being a semi-arid region, agricultural production is largely unreliable due to the scarcity of rain so farmers go to an extra mile by engaging in vegetable farming instead of perennial and annual crops. Moreover, the most recent government's decision to relocate its central administration from Dar es Salaam City to Dodoma City effective from September 2016 to

2020 makes the City one of the fastest growing urban areas in Tanzania. This makes the City strategically positioned for business due to increased population which increases demand of vegetable for household consumption but also hotels and restaurants.

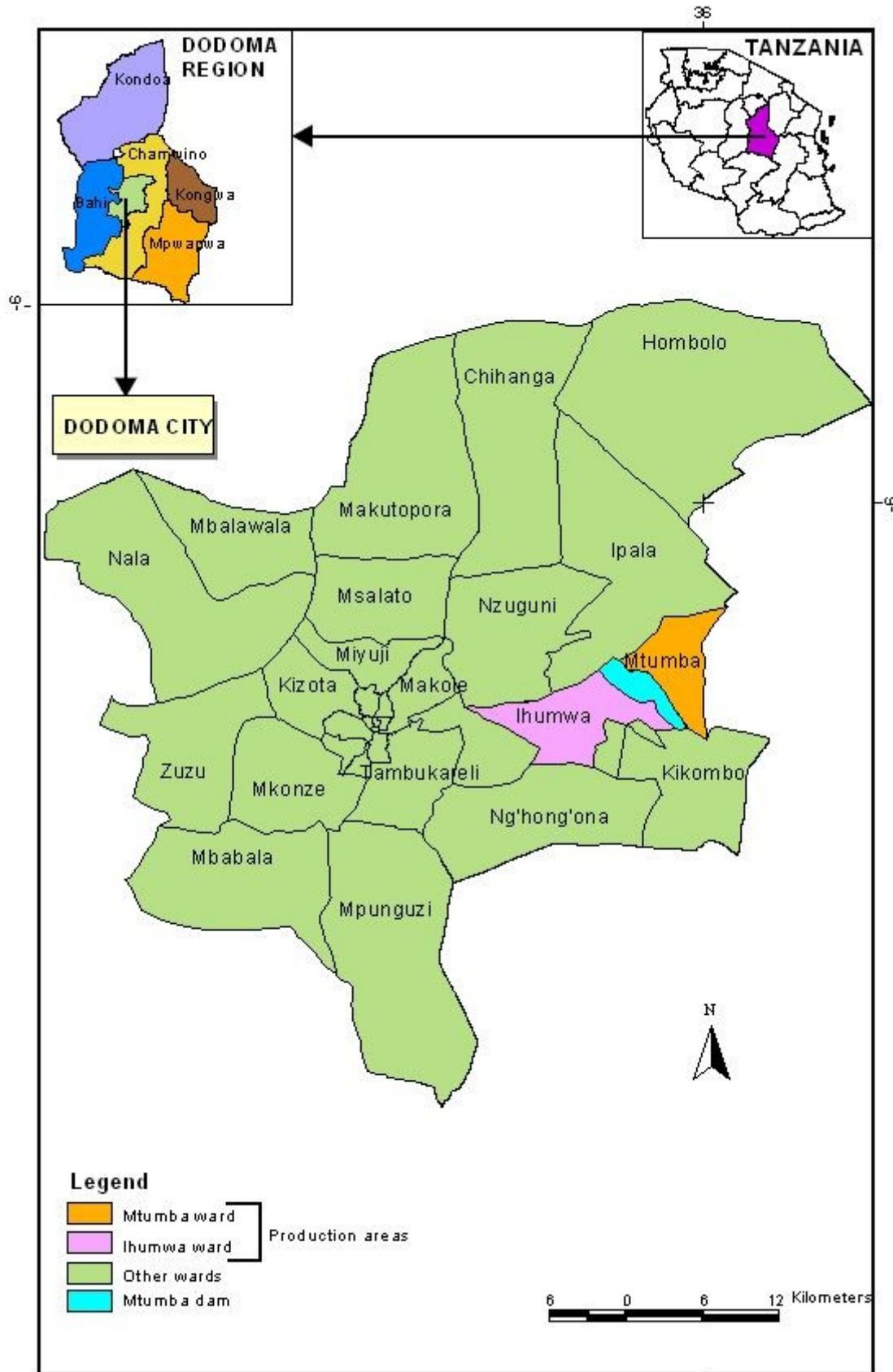


Figure 1.3: A map of Dodoma City showing the location of the study wards

1.9.2 Study design

The study employed a case study and cross sectional research designs whereby a mixed methods research approach was adopted. The design allows the researcher to converge quantitative and qualitative data in order to provide a comprehensive analysis of the research problem. It also enables the collection of both quantitative and qualitative data and then integrates the information in the interpretation of the overall results (Creswell, 2014).

1.9.3 Sampling technique and sample size

A two-stage sampling technique was used to select respondents for this study. The first stage involved purposive selection of vegetable production areas and all the nine (9) production areas found in the two wards were included in the study. This was important in capturing any differences in the livelihood outcomes of the youth vegetable farmers which could be associated with their production site. Simple random sampling technique by using the lottery method was used in the second stage to select 31 vegetable farmers (aged between 15 and 35 years) from each production area which made a total of 276 respondents. The list of vegetable farmers obtained from the Ward Executive Officers was used in the selection of these respondents. The sample size was determined by employing Yamane (1967) formula as detailed below:

Where:

$$n = \frac{N}{1 + N(e)^2}$$

Where: n = Sample size

N = Population size

e = Level of precision or sampling error, estimated in percentages (0.05)

$n = \frac{896}{1 + 896(0.05)^2} = 276$. However, the study ended up with 250 which is 91 percent of the required respondents.

1.9.4 Data collection

Both qualitative and quantitative data collection methods were used. Triangulating data sources is a means for seeking convergence across qualitative and quantitative methods because each method has its own limitation (Tashakkori and Teddlie, 2010). Quantitative data for the study were collected using an interview schedule. The collection of qualitative data including production and marketing strategies used by the youth in vegetable farming in the study area was done using focus group discussions (FGDs), in-depth interviews and key informants (KIs). The FGDs and KIs were guided by a checklist of items. A total of nine FGDs composed of 9-12 participants were conducted, one in each production area. For clarity and good quality of data a FGD should have 9-12 participants (Masadeh, 2012). In addition, nine (9) key informants were interviewed on the basis of their positions and experience. These were one (1) City Agriculture Development officer, two (2) Ward Community Development Officers, two (2) Ward Executive Officers, two (2) agro-input dealers, and two (2) Ward Agricultural Extension Officers.

1.9.5 Data analysis

The details for analysing data with respect to the specific objectives of the study and the measurement of variables are presented chronologically in Chapter 2 under respective papers. Summary of data analysis methods for each specific objective is presented in Table 1. Content analysis method as recommended by Josilowski (2017) and Mayring (2014) was used to analyse qualitative data. This was informed by the interpretative phenomenological approach for purposes of understanding the phenomenon under investigation; that is, the strategies employed in vegetable production and marketing from the actor's point of view. In fact the approach allows the researcher to describe the lived experiences of individuals about a phenomenon as described by participants. This description culminates in the essence of the experiences for several individuals who have all experienced the phenomenon and in the end the views from the participant's life with those of the researcher are combined to provide the results (Creswell, 2014).

The perceptions of the youth towards vegetable farming were measured by a Likert scale. The scale has been found to be an effective technique for the measurement of perceptions (Likert, 1932). The study used a 5 points Likert scale (1 = strongly agree, 2 = agree, 3 = undecided, 4 = disagree and 5 = strongly disagree). Responses from all statements were combined to create a measurement of a Perception Scale (PS). PS is a single variable used to represent cumulative perception of attitude (Likert, 1932). Statements favourable to the construct were positively worded while unfavorable statements used negative connotation. Then numerical values for the response options were reversed when calculating the overall score.

The higher values indicated positive perceptions toward vegetable farming while low values indicated negative perceptions (i.e. unfavourably response) towards the enterprise. The overall scores on the Likert scale were categorized into positive, neutral and negative perception. The highest possible score was calculated by multiplying 8 statements by 5 points to get 40 points, while the middle point was calculated by multiplying 8 statements by 3 points to get 24 points, and the lowest possible score was calculated by multiplying 8 statements by 1 point to get 8 points. Therefore, 24 was the cut-off point and stood for neutral perception. Hence, scores from 8 to 23 on the overall scores were considered as negative perception whereas 25 to 40 stood for positive perception.

Livelihood outcome was measured by developing a livelihood outcomes index. The index sought to measure whether engagement in vegetable farming improved the youth's human capital, social networks and assets, improved household food security and increased household income. Each indicator was measured by three sub-indicators which were measured on three points Likert scale (low, medium and high livelihood outcomes) and coded as 1, 2 and 3. The overall score for each of the five indicators was found, and these scores were used in developing the livelihood outcome index. The highest possible score for the five indicators was obtained by multiplying 3 by 15 to yield 45, while the mid value

was obtained by multiplying 2 by 15 to yield 30 and the minimum possible score was obtained by multiplying 1 by 15 to yield 15. So, the mid-cut value of 30 scores was coded as medium, 15 to 29 low and 31 to 45 high. Field (2009) suggests that, it is important to check the reliability of a scale and the most common measure of scale reliability is Cronbach's alpha. Reliability gives Indication of an instrument whether it can be interpreted consistently across different situations. Cronbach's alpha value ranges from 0 to 1.0 (De Vaus, 2002). Scholars suggest that a value of 0.7 to 0.8 is an acceptable value for Cronbach's alpha (Pallant, 2007; Field, 2009). The Cronbach's alpha for perception scale was 0.74 while for the livelihood outcomes was 0.76 which indicates that the research instruments were reliable.

Chi-square was used to determine the association between livelihood outcomes and perception among the youth involved in vegetable farming at 5% level of significance. Spearman correlation coefficients were used to measure the strength and direction of the relationship between the two variables. As advised by Field (2013), the appropriate model for predicting ordered categorical outcomes is ordinal logistic regression as it considers the order of values of outcome variables. Hence, it was used to assess the determinants of the level of livelihood outcomes among the youths involved in vegetable farming. Interpretation of the output from the model focused on β -coefficients for determining whether the direction of the predictor variable was positive or negative (positive values connoted a positive direction, meaning that the variable increases the probability for the outcome variable to occur; significant (p -values < 0.05) for measuring the significance of the contribution of each of the predictor variables on the predictive ability of the model and the odds ratio (Exp (B) values) for explaining the chances for the outcome variable to occur subject to a predictor variable or when a predictor variable is increased by one.

Table 1.1: Data Analysis Methods for Each Specific Objective of the Study

S/N	Objective	Data analysis method
1.	Analyse the strategies involved in vegetable farming among the youths in Ihumwa and Mtumba Wards.	Content and descriptive analyses; interpretative phenomenological approach
2.	Examine youths' perception towards vegetable farming in relation to their livelihood outcomes in Ihumwa and Mtumba Wards.	Content and descriptive analyses; Chi square, Correlation analysis
3.	Determine the contribution of vegetable farming to livelihood outcomes among the youths in Ihumwa and Mtumba wards.	Content and descriptive analyses; Ordinal logistics regression

1.10 Organization of the Thesis

This thesis is organised into five chapters. The first chapter consists of the introduction which highlights the background to the problem that the thesis addresses, among other items. Chapter two presents the first manuscript which covers the first objective of the study and focuses on production and marketing strategies employed by the youths in vegetable farming. Chapter three presents the second manuscript that focused on youths' perception towards vegetable farming in relation to their livelihood outcomes. Chapter four presents the third manuscript on the levels of livelihood outcomes and their determinants among the youth vegetable farmers. The fifth chapter presents a summary of the results and discussion presented in all the manuscripts and ultimately draws the conclusions on the study findings and offers recommendations.

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CHAPTER TWO

2.0 PRODUCTION AND MARKETING STRATEGIES EMPLOYED BY YOUTH VEGETABLE FARMERS IN TANZANIA: A CASE OF IHUMWA AND MTUMBA WARDS IN DODOMA CITY

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2.1 Abstract

Using a case study approach and the sustainable livelihood framework (SLF), this chapter explored production and marketing strategies used by youth vegetable farmers in Ihumwa and Mtumba wards in Dodoma City. Data were collected using In-depth-interviews, focus group discussion FGDs and Key informants interview (KI). The collected data were analysed using content analysis techniques which were informed by interpretative phenomenological approach for the purposes of understanding the phenomenon under investigation. The study established that the strategies used by the youth differed depending on the type of assets that the youth farmers were entitled to. For example, youth who had strong network were able to produce cost effectively and aggregation of their vegetable resulted into marketing of larger volume of vegetable. This improved access to bulk buyers and increased their collective and individual profit. However, timing in production, producing vegetable which are beyond the youth farmers comfort zone such as

rarely produced in the area and beyond the production of traditional crops for market targets were important strategies associated with youths' success in vegetable farming. However, working under limited resources, compelled some youths to venture into survival strategies such as producing under rain-fed conditions and using poor production tools. The study concluded that production and marketing strategies are interlinked in such a way that production strategies are conditioned by market opportunities. This is reflected in youth engaging in production of vegetable which needed low investment mainly in order to minimize the risks associated with marketing. It is therefore recommended that these issues need to be addressed in interventions put in place to promote youths' involvement in agriculture in Tanzania.

Key words: Youth, vegetable farming strategies, Dodoma City

2.2 Introduction

Involvement of the youth in various agricultural activities such as vegetable farming, livestock production, crop processing and marketing has been widely documented (Ibidapo *et al.*, 2017; Agboola *et al.*, 2015; Oluwasola, 2015; Gulamiwa, 2015; FAO, 2013; Njenga *et al.*, 2012). It is generally argued that the agricultural sector has the potential to fuel a sustainable inclusive growth process and providing jobs especially given the many African countries' small and poorly performing industrial sectors (URT, 2016; Alliance for a Green Revolution in Africa (AGRA) 2015; Brooks *et al.*, 2013; FAO, 2013). However evidence show that the youth exit the agricultural sector prematurely and this is largely because of the minimal financial returns in comparison with formal and other informal sectors (Juma *et al.*, 2015; Leavy and Hossain, 2014). Implicitly, to fulfil its potential as an employment solution for the youth, the sector must first become more profitable, competitive and intellectually stimulating (Brooks *et al.*, 2012, Proctor, 2012). Hence, given the

significance of the agricultural sector in providing employment for the youths, much has been written concerning the sector in recent years. In particular, some studies have focused on policies for engaging the youths (example, Ayel *et al.*, 2017; Losch, 2014; Rutta, 2012).

On the other hand, other studies point to the type of crops the youths engage in so as to earn quick money (Brooks *et al.*, 2013; Rutta, 2012; Proctor *et al.*, 2012). Moreover, a large body of literature exists on the factors affecting youths' participation in agriculture (Mutua *et al.*, 2017; Nguyen *et al.*, 2016; Anania, 2016; AGRA, 2015; FAO, 2014; Naamwintome and Bagson, 2013; White, 2012; Laevy and Smith, 2010; Adekunle *et al.*, 2009). However, while acknowledging that the concern about youth employment is not new in agriculture discourse, the strategies used by the youth in undertaking agricultural activities have hardly attracted scholarly attention. Consequently, this paper went beyond the more common focus on why youths choose to leave farming and instead analysed their strategies in farming by documenting the lived experiences of those who are establishing themselves as vegetable producers.

In this paper strategies are used to refer to actions consciously implemented by farmers in order to achieve given performance with an expected effect on the farm trajectory (Grando *et al.*, 2016). These strategies may involve efficient production of traditional farm commodities, on-farm processing and direct marketing of products to consumers, just to mention a few. Evidence shows that farmers select their strategies in specific contexts with the aim of improving farm business and enhancing livelihoods or preventing the effects of potentially harmful changes (Grando *et al.*, 2016). Yet, similar situations do not necessarily lead to the choice of the same strategies for different youth farmers (Umunnakwe *et al.*, 2015; Sheheli, 2012). Analysing various strategies in which livelihoods are formed is crucial in understanding the mechanisms that enable some people to uplift themselves out

of poverty and the structural factors that may instead limit them. Thus, understanding why the youth farmers employ a particular strategy merits attention. In doing so, it becomes possible to draw from examples of the best production and marketing practices for designing youth policies, support programmes and interventions.

2.3 Theoretical Framework

This paper draws on the Sustainable Livelihoods Framework (SLF) as an interpretive lens. The framework is considered relevant given its strength it offers in explaining how livelihood strategies are reflected in people's livelihood outcomes. Specifically the paper is focused on how livelihood assets impact on production and marketing strategies used by the youth in vegetable farming. The SLF identifies five assets which are the human, natural, financial, social and physical capitals from which individuals may determine their production possibilities (Ashley and Carney, 1999). For example, when personal characteristics such as farming skills, experience and knowledge increase, people can raise productivity through adopting better farming practices and improve their livelihoods. Also, the more the youth farmers are connected with others in formal and informal groups, the better they understand the rules and opportunities for participation. Natural resources such as land and water, when accessible, can raise production through expansion of farm size and irrigation farming. Financial assets including savings (cash as well as liquid assets) and credit (formal & informal), when accessible, can also enhance production and productivity through purchase of inputs and labour saving tools. Lastly, physical infrastructure and technology including roads and communications means between consumers and producers are important for marketing of products (Lemke *et al.*, 2012).

However, youths possess different levels of resource endowment and endure different scales of exposure to the institutions and policies that condition the environment in which

they operate. The interaction of these factors determines youths' strategies in vegetable farming and the consequent differences in welfare outcomes. In practice, SLF is people-centred in a direct sense, and depends upon the involvement of those meant to be helped by change (Bennett, 2010). This is both a principled and practical stance as it is hard to imagine being able to apply SLF without the involvement of people (Scoones, 1998). This provides opportunities for community-based learning where people can learn from each other as well as from outsiders.

2.4 Methodology

This study was conducted in Mtumba and Ihumwa wards in Dodoma City¹, Tanzania. The two wards were purposively selected for the study because they are prominent areas in vegetable production in the City. Based on the rapid assessment of the youths' participation in agriculture conducted by the Ministry of Agriculture Livestock and Fisheries in 2014, Dodoma City ranks fourth in terms of the number of youths engaged in agricultural activities in Tanzania and the first in central zone (URT, 2016). Moreover, the study area is categorized as a semi-arid region with a long dry season from late April to early December, and a short single rainy season from December to mid-April. The average rainfall is 500mm annually, and about 85% of this falls in the four months between December and March (URT, 2014). Based on these factors, agricultural production in the area is largely unreliable due to scarcity of rain; so, the farmers have to go to an extra mile by engaging in vegetable farming instead of perennial or annual crops.

A multiple-case studies research approach was used to gain a deeper and holistic understanding of the strategies used by the youth in vegetable production in Ihumwa and Mtumba wards. According to Yin (2014), qualitative case study designs explore differences

¹ Formerly a Municipality and only attained the City status in 2018

within and between cases and provide a basis to apply solutions to situations. Moreover, multiple case studies can be used to either augur contrasting results for expected reasons or either augur similar results in the studies (Yin, 2014). A two-stage sampling technique was used in selecting respondents for the study. The first stage involved purposive selection of production areas and the second stage involved selection of respondents. Nine production areas were identified from the two wards and were all covered in the study. These included Chang'ombe, Chilwana, Mbugani, Iloilo, Shuleni, Kididimo, Mission Station and Bondeni. The reason for including all the production areas was to capture the differences in strategies used by the youth in vegetable farming that could be associated with their production site.

The second stage involved selection of the participants for focus group discussion, key informant interview and In-depth interviews. In each production area; one group comprising a total of 9-12 youth farmers was selected for focus group discussion (FGD). According to Barbour and Kitzinger (2011), this is a reasonable number for a FGD to be conducted and obtain the meaningful information. Therefore, a total of nine (9) FGDs were conducted to discuss various strategies used by the youth in the vegetable farming enterprise. Moreover, after every FGD a wealth ranking exercise was conducted at the production area to identify the youth vegetable farmers who were considered as successful and less successful in the area. The criteria used in wealth ranking included the ability to engage in vegetable production throughout the year, timely purchase of inputs, use of modern equipment and the type of vegetables produced. These criteria were identified in the field by the youth in collaboration with the researcher.

From the wealth ranking exercise five cases were identified as successful and four identified as less successful cases according to the wealth ranking criteria mentioned earlier. Hence, a maximum variation purposive sampling technique was applied to select

the four youth vegetable farmers who saved as cases in this study for eliciting more information on the strategies used. The maximum variation purposive sampling technique was used to ensure diversity of strategies used by individual youth farmers ([Cresswell and Plano, 2011](#)). Of the four cases two were identified as successful while the other two as the less successful according to the criteria mentioned earlier. Interviews and FGD guides were developed to provide a guided discussion during the discussion and probe unanticipated responses without deviating from the core interview questions (Rubin and Babbie, 1997). All interviews and FGDs with youth vegetable farmers were recorded to ensure that information was well captured. However, consent was sought from the participants before recording and they were informed that the information obtained were for academic purposely only. Key informant interviews were conducted with the Ward Executive Officers, Ward Community Development Officers, agro-input dealers, Agricultural Extension Officers and horticulturalists. FGDs and KI interviews were conducted in the participants' workplaces while in-depth interviews with selected youth farmers were conducted at their households. Both FGD and Interviews took about 45 to 90 minutes.

A considerable amount of transcripts from interviews with the selected cases and key informants, FGDs and observations were transcribed and coded into emergent themes and analysed using the content analysis method (Mayring, 2014). This was informed by the interpretative phenomenological approach for purposes of understanding the phenomenon under investigation from the youth farmer's point of view. To ensure privacy of the respondents and to maintain confidentiality of their accounts, pseudonyms have been used throughout this paper.

2.5 Results

The findings of the study have been organized into two major parts. The first part describes the four case studies while the second part presents result obtained from the FGDs.

2.5.1 Cases

As mentioned earlier, four cases were selected purposively based on wealth ranking criteria whereby the first two cases (first and second) were considered successful and the other two (three and four) were considered less successful. The first, second, third and fourth cases respectively are identified by pseudonyms as John, Herman, Daniel and Pendo.

2.5.1.1 Case # 1 John

John's interview was conducted on August 2nd, 2017. He was one of the successful youth farmers according to the criteria used in wealth ranking. He was 33 years old with seven years of farming experience. John holds a bachelor's degree in Development Finance and Investment Planning from the Institute of Rural Development Planning based in Dodoma City. He had worked with the School of Journalism as a database analyst for two years before he resigned in 2012 and started farming as a career. John is one of the six founders of the Tanzania Youth Investment Club (TYIC), which supports the youth to get into agribusiness. It is a registered organization which started with 100 members but the rest dropped and at the time of the interview there were only 18 members. As a group, they mainly produced tomatoes, onions, carrots and cucumbers on a 2.8 ha land. At the end of each production season they share the profits according to the share of investment made by each member. In fact the share considered the time one spent, how many times the member visited the garden and what he did. They allocated the amount of money to be paid for every piece of work.

Through the organization, they secured some funds from the *Mabilioni ya Kikwete* Fund Scheme² and FAO amounting to TZS 56 000 000 and TZS 8 000 000 respectively which they invested in the drilling and construction of a deep borehole and water pumps for irrigation. They also negotiated with agro input companies to get inputs directly from them. Also, they had been able to establish buyers' database within and outside the City of Dodoma which they use whenever they want to sell their produce individually or as a group. Apart from the group's joint venture, John practises individually greenhouse farming involving production of red and yellow pepper on a 0.2 ha land and tomatoes on 1.4 ha. From the sale of vegetables he gets an average of 2.6 million per season. He has been able to secure 51 acres of land of his own and put up a business of importing irrigation tubes from China, which he sells to other farmers. He has attended trainings and workshops on vegetable production, greenhouse farming and entrepreneurship skills inside and outside the country. In addition, he conducts agricultural related consultancies as a means of increasing income. When he was asked about what makes a farmer successful in this business, he said;

“It is a matter of being visionary and having relevant farming skills”.

In future, John plans to establish his own food processing plant and raise livestock.

2.5.1.2 Case # 2 Herman

Herman is one of the successful youth farmers too and his interview took place on 3rd July 2017. He was 35 years old and had been in vegetable farming for 17 years. He started vegetable farming as a career after completing primary education and inheriting 1.4 ha of land from his parents. He started by producing *Amaranthus* and Chinese cabbage but they did not fetch him profit owing to high competition in the market as almost all farmers were

²*Mabilioni ya Kikwete* (Kikwete's billions) was a fund established by the Fourth Phase Government President (2005-2015), His Excellency President Jakaya Mrisho Kikwete. Under this funding scheme TZS 1 billion was allocated to every region in the country (Tanzania) to be lent to the youth to enable them undertake enterprises using low interest loans.

producing the same commodities and selling them in the same area. Besides, the income earned was used to purchase livestock and land which he sold when the market prices rose in order to make profit. Through this business, he saved enough capital which he used to drill a borehole and to purchase a water pump. The facilities helped him to increase production and in 2016 he managed to expand his farm land by 0.2 ha. He later started production of rare crops in the area such as coat meal and chilli pepper which had good market. From this strategy, he was able to build his first mud house with corrugated iron sheets roofing. Herman also produced such crops as onions which could be easily stored and sold when the price was favourable. This helped him to extend his borehole and buy bigger water pumps which could supply water to the neighbourhood for domestic use and irrigation. From these investments, he managed to build a brick house for his family and another one for renting. Most of his customers bought products from his farm because he conducted most of the production in the dry season when many farmers did not cultivate because they depended on rain-fed agriculture. From vegetable sale Herman gets an average of 2.3 million per season.

Herman was not a member of any farmers' organization and was not interested in joining one because of his scepticism of their reliability as shown by his remarks;

“Farmers around this area formed an organization once and were assisted with a water pump, but one of the members disappeared with the machine”.

Herman gets agricultural inputs from the local retail shops but complained that most of them were expensive and ineffective;

“For example, a 30 ml bottle for Coragen (an insecticide for TUTA OBSOLUTA) is sold at TZS 25 000/= and sometimes farmers are supposed to use more than 4 bottles on a 0.2 ha land, depending on the stage of the produce and sometimes they need to spray 3-4 times before harvesting”.

When asked about what makes a farmer successful in this business, he said;

“It is one’s ability to buy inputs and to value your work”.

In future Herman plans to buy heavy duty water tanks so that he can supply water for irrigation and domestic use to the entire local community.

2.5.1.3 Case # 3: Daniel

The interview with Daniel was conducted on 20th July 2017. He was one of the youngest (20 years) youth farmers and less successful according to the wealth ranking. Daniel had four years’ experience in vegetable farming and he started farming as a career after dropping out of school when he was in form two. He owns 0.2 ha land which he inherited from his parents and lives with his eighteen years old brother who helps him in his small-scale farming. He uses his plot mainly to produce Chinese cabbage and tomatoes. He said that he had not been able to expand his production since he started farming because what he got could not cater for the needs of the family. Therefore, he depends on proceeds of the labour he provides to other people’s farms for feeding his family and vegetable production. His involvement in vegetation production is seasonal as it was done only during the rainy seasons because he did not have a reliable source of water for vegetable production. From vegetable sale Daniel gets an average of TZS 450, 000/= per season. He normally buy agricultural inputs from retail shops, which he complained were very expensive as revealed by his remark;

“Sometimes when the plants are highly infested with pests, we just cut them down and start replanting because we can’t afford buying the pesticides”.

Daniel had not consulted any agricultural extension officer because he did not know if there was one in the area as he had never seen any since he started farming. When he was asked about how and where he normally sold his produce, he said;

“I don’t produce much, so I sell my products in the locality, and when buyers come to our production site sometimes I show them my produce so that they can buy if interested”.

He also explained that he was not a member of any farmers’ organization because there was no FOs in the area. However, he expressed his wish to join one someday. Also, he reported that comparing now and when he started farming, it was easy for him to meet the costs of his health needs. From vegetable sales he had been able to renovate his house from a thatched roof house to one with corrugated iron sheets. When asked about what makes a farmer successful in that business, he said that it was mainly one’s investment capital. Daniel planned to continue with his secondary school education in the future since he wants to pursue his education up to the university level.

2.5.1.4 Case # 4: Pendo

Pendo also was one of the less successful cases according to the criteria used. Her interview took place on 2nd September 2017. She was 33 years old and a single mother of three children. She started vegetable farming after completing her primary education and inherited 0.4 ha of land from her parents. On that plot, she produced mainly Chinese cabbage and *Amaranthus*. She complained about not earning much because she did not get enough time for farming as she also had to take care of her family. From her vegetable garden she gets an average of TZS 600 000/= per season. Pendo was a member of a women’s self-help group (SHG)³ in the area from which she used to borrow up to TZS 100 000/= per month for vegetable production. She did most of her vegetable farming

³Self Help Group (SHG) refers to a small economically homogeneous affinity group in which members voluntarily come together. They save a small amount of money regularly, which is deposited in a common fund to meet members' needs and provide collateral free loans decided by the group.

during the rainy seasons because she did not have a reliable source of water for irrigation purposes. During the interview, she said;

“During the dry seasons, most of the water wells we depend on for watering our crops dry up or remain with very little water which is deep in such a way that only men can manage to get it with a bucket from there because they are energetic”.

Pendo used to buy her agricultural inputs from retail shops after consulting other farmers about the quality and type of inputs to buy. She said that the most challenging part of her work was to get the inputs because they were very expensive and sometimes they were required to get them from Dar es Salaam. She sold her vegetable at the city market. She explained that the selling price depends on the prevailing circumstances and season. For instance, when there was a lot of vegetable in the market, the prices drastically dropped and only increased when there was scarcity of the produce. She also complained about not having a permanent place for selling her produce and those they were often chased away by police officers whenever they tried to hawk their produce. When asked why she did not take her produce to Dar es Salaam as other farmers did, she said;

“Middle men cheat farmers a lot, so if I want to get good profit I have to go there myself but I have no one to take care of my business during my absence”.

From the sale of vegetables, she was able to build a house with block bricks which was not yet finished and take her children to school as one of the children was in secondary school. When asked what made a farmer successful in this business, she said;

"It is the ability to buy agricultural inputs and get reliable sources of water".

She said that she planned to diversify her farming by engaging in poultry keeping and starting a retail shop in the future.

2.5.2 Results from FGDs and KIIs

Focus group discussions and key informant interviews were used to explore more on the strategies used by the youth in vegetable farming. One of the issues which were raised during the discussions was the youth's preference to working individually but not in groups as members of cooperative societies. It was revealed that the major reason for this tendency was mistrust amongst them. For example, in a male FGD conducted at Ihumwa on 31st August 2017, it was revealed that an organisation that was formed in 2012 did not last because one member disappeared with the group's water pumps and generator. The mistrust also evident in the interview with the City Agriculture, Irrigation and Cooperative Officer (CAICO) who said;

“It is hard to find youths with a common purpose and that is why the majority of them have failed to access the funds allocated for youth development programmes in the city”.

In a female FGD conducted at Ihumwa on 27th August 2017, it emerged that knowledge of agro-shop dealers about the inputs they sold was considered important in providing adequate information to farmers. For instance, one of the members said;

“With the seeds we used in the past, we could pick Chinese cabbage leaves up to four times (cycles) before we cut down the plants, but nowadays we do it only once or twice and the plants mature”.

When contacted to give their opinion on this matter, most input dealers couldn't provide a better explanation of the claims. However, one of the technicians at the Horticulture Unit at Sokoine University of Agriculture explained;

“It is common with hybrid seeds because their plants tend to mature at the same time, unlike plants from traditional seeds which tend to mature slowly”.

It was also revealed that the type of crops produced by the youth had implications on their livelihoods as vegetable farmers. As such, some crops were considered low paying in terms of income generated compared to others. For instance, it was revealed in a male FGD conducted at Mtumba on 22nd July 2017 that farmers grew *Amaranthus* when felt tired because it was not the kind of a crop which one could make much money from. They only produced it to get just a little amount of money for their families' basic needs. Drawing on both cases, FGDs and KIIs, the strategies employed by the youth in vegetable production are as presented in Table 1. This informs the discussion below.

Table 2.1: Strategies employed by the youth in vegetable production

Production strategies		
Funds for working capital	Access to inputs	Type of crops produced
<ol style="list-style-type: none"> 1. Membership in FO 2. Selling labour. 3. Business diversification 	<ol style="list-style-type: none"> 1. Agro dealer companies 2. Agro-dealer shops 	<ol style="list-style-type: none"> 1. Production of vegetable which needed high/low investment.
Marketing strategies		
Mode of sale	Choice of vegetable	Production season
<ol style="list-style-type: none"> 1. Online 2. Market vending 3. Farm gate 	<ol style="list-style-type: none"> 1. Rarely produced 2. Easily stored 	<ol style="list-style-type: none"> 1. Dry season 2. Rainy season

2.6 Discussion

According to this study, vegetable farming was largely based on production and marketing strategies. As regards production strategies, funds for working capital, access to inputs and types of crops produced were critical issues in vegetable farming and business.

2.6.1 Strategies used for accessibility of funds for working capital

The sub-themes that emerged under this theme were to join farmer's organisation and strategic sale of labour. The study findings show that investment in social capital had implications regarding accessibility of funds among the youth farmers. For example, John and Herman seemed successful in the business compared to the rest as they were able to

diversify into non-farm activities and acquired some valuable assets. However, it had taken John seven years to excel while it took Herman even longer-seventeen years in total. This had been possible for John because he was a member of a farmers' organization (FO⁴) and through it he received some funds and training. Herman had never accessed any agricultural related opportunity but diversified his business which had an implication on time and finance. This made it difficult for Herman to undertake improved farm practices and increase production.

Evidently, this discrepancy in their welfare outcomes is attributed to the strategies used in accessing funds as working capital. Previous studies contend that access to financial sources is a critical factor in developing self-employment opportunities for the youth (Akpan *et al.*, 2015; Ahaibwe *et al.*, 2013; Adesiji *et al.*, 2011). Besides, all four cases had land which they could use as collateral for accessibility of funds but they could not because they had no legal rights over the land on which they did their farming and getting it was reported as a complicated business that they could not afford. Hence, the best alternative for them was to join a FO as it serves as a means for advocacy and communication with financial institutions and other development actors.

Nevertheless, it was evident that successful organizational development demands members' commitment as it has been learnt from John's story members dropped from 100 to 18. This means that farmer's organisation should be considered for the youth who have established themselves as farmers already for commitment purposes. This will help them join the organisation while knowing what it takes to be successful in the business and that the organization is only used to fulfil their dreams. With this approach every member will be responsible and self-motivated because of the investment done instead of just joining the organization with higher expectation of excelling because of the organisation Education

⁴FO has been defined as a formal or informal membership-based collective action institution serving its members that get their entire livelihood from agriculture (FAO, 2014)

also seems an important aspect for the youth when it comes to accessing financial services since they are more interested in modernised kind of farming which require better farming technologies. This is owed to the fact that most youth do not own assets which could be used as collateral for funds accessibility. As revealed from Herman's story, it took him 17 years to excel in the business because he had no the required knowledge and skills to write feasible business plan and take it to appropriate funding organization just like what John did.

In the same vein, FOs' capacity to serve members cannot be ignored if members' livelihoods are to be improved. For instance, Pendo was a member of a self-help group (SHG) which could provide a token amount of money as loan to its members. As revealed from her own story, even after seventeen years of vegetable production she was still using a bucket for watering her vegetable garden. This means the amount of money she received could not adequately enable her to adopt better technologies including the use of better farming tools and this led to her low livelihood outcomes. According to Bullen and Sokheang (2015), if SHGs are not well connected to formal institutions for additional funds, they have only a limited capacity to grow and serve their members. However, Pendo being a single mother to three children and provide them with education means she had to balance vegetable farming with taking care of the family. This reduces her time to concentrate on her business.

Strategic sale of labour

Selling labour appeared to be one of the most important strategies used for accessing funds among youth farmers. The youth in the study area sold their labour⁵ strategically. They worked in groups and ensured that members of their groups produced the same type of crops and at the same time. This was mostly done before they started production to make

⁵Selling labour refers to youth farmers with their own land for vegetable production but derive part of their income as payment for work performed on the farms of others

sure that the money they got could enable them to buy all the needed inputs for farm production in that particular season. This approach gave them time to concentrate in their own individual farming activities during the season. On the other hand, it took a long time for these youths to realize their ambition in vegetable production because waged agricultural workers were normally confronted with poor and unstable wages. The income obtained from this strategy could not adequately cater for their production needs to excel in the business. This could be one of the reasons for Daniel's low livelihood outcome compared to John's and Herman's. According to Shoaib *et al.* (2016), agricultural labour does not ensure decent levels of income and sustainable livelihoods; hence, agricultural labourers are among the groups with the highest incidence of poverty in many countries.

Beyond “comfort zone” in crops production

The study findings show that the youth were interested in commercial farming but not in subsistence farming. However, the selection of which crop to grow was determined by financial capital as most of the well-paying crops such as onions, zucchini, and beetroot required high investment. For example, while *Amaranthus* and Chinese cabbage were the most produced crops, onions were less produced. However, the findings showed that onions were doing well in terms of income generated from their sales compared to the crops mentioned earlier. These crops were preferred because their seeds were sold at low prices compared to onion seeds but also it takes short time to grow them. This is because within one month Chinese cabbage can mature and be picked while onions take three months involving huge resource expenditure in terms of labour, time and cash. This gives the impression that the tendency to grow crops which require less investment without considering the outcomes makes farmers to end up as subsistence producers. Clearly, it takes more than production of crops which are within the comfort zone for farmers to transform from being subsistence to becoming commercial producers. In a study by Greig

(2009), it was revealed that, for commercial farmers, the economic capability of the crop is more influential; for subsistence farmers the taste of the crop and less investment costs by the farmer is important.

2.6.2 Strategies for accessing inputs

Vegetable farmers including the youth either purchased inputs directly from agro-input companies or got them from agro dealer shops. John used the first approach and was one of the most successful vegetable producers in the study area. This is because most of these companies do provide trainings and monitor the performance of their products in the field. Hence, this lowers production cost which might rise due to inappropriate use of inputs and purchase of spurious inputs. For example, in one of the female FGDs conducted at Ihumwa on 30th August, 2017, it was revealed that farmers planted tomatoes in 2016 but that the plants could not bear fruits at all so they had to cut down the plants and plant others using different types of seed. When one the government officials was interviewed on the matter, she opined;

“It is a free market; so, it is not easy to control the quality and price. That is why we have been promoting producers’ associations so that farmers get inputs direct from agro-input companies because it makes it easy to hold them responsible for poor performance of the inputs supplied by them”.

On the other hand, the study findings show that agro-shop dealers provided the major source of extension advisory services in the area. This implies that input dealers must possess the appropriate knowledge about the inputs they sell in order to provide adequate information to farmers. For example, during one of the female FGDs conducted at Mtumba on 11th July, 2017 it was revealed that farmers were concerned with hybrid seeds which, when they use them, ended up only picking Chinese leafs once or twice while with traditional seeds they used to pick up to four times (cycles) before the plants matured.

Following this allegation the input dealers who were interviewed couldn't provide a better explanation. This indicated lack of knowledge among the farmers for they did not understand that the hybrid plants tend to mature at the same time, unlike plants from traditional seeds which tend to mature slowly and at different time. Thus, farmers needed information on the characteristics of these seeds for an informed decision making. These observations are corroborated by Waghmode *et al.* (2014) that a proper training of agriculture input dealers on a normative basis could go a long way in transforming agriculture from subsistence to a business activity among smallholder farmers

2.6.3 Strategies for marketing and trading of products

The study findings show that two marketing strategies were practised by the youth vegetable farmers' i.e direct market channel and farm gate sales. In addition, two ways of selling products directly to customers were identified. The first approach involved bundling produce into 200–500 gram bunches and selling them to customers at the market. The second one involved online selling through establishment of buyers' database. Although scholars such as Karaxha *et al.* (2016) acknowledge the advantage of the direct marketing channel, evidence from this study suggests that several factors including location must be considered when choosing this channel. For instance, Pendo and John used this channel but the former seemed less successful in the business. The disparity was attributed to the fact that Pendo lacked a permanent place for selling her vegetables. Hence, charged low prices for her products to attract more customers and ensure that the produce was sold on the same day since she had no facilities to properly handle the unsold produce at the end of the day. As a result, some leftover produce was freely given away the next day or sold at a throw-away price. Consequently, lowering the income generated from the products lowers the income generated from the products and ultimately leading to a poor livelihood.

Herman used farm gate sales approach and seemed successful compared to Pendo but less successful compared to John who used online approach. The difference observed between John and Herman livelihood is created by John's exposure through the trainings and workshop he attended. This helped him understand what vegetable to produce, when and where to sell even before the actual production through constant communication with buyers through information and communication technology. Generally, based on this approach, production is done strategically to maximize profit as it is easy to get information about changing consumer preferences in terms of quantity, quality, variety, and food safety. As reported elsewhere, access to information can possibly enable better incomes and productivity to the farmers (Mittal and Tripathi, 2009). Moreover, the disparity between farm gate price and final market price is also an important area for the livelihood differences observed. This is because only an informed farmer is in a vantage position to ask for a better farm gate price and given poor information dispersion among farmers this approach can hardly improve farmer's livelihood.

Beyond traditional crops for market targets

The study results show that the types of vegetable produced by the youth had important implications for marketing. For instance, in one of the male FGDs it was claimed that farmers only grew African spinach leaves (*Amaranthus* spp.) during the low season because it was not paying in terms of income generated. This means that *Amaranthus* was considered an inferior crop. Hence, farmers who mainly produced this type of crop were more likely to have low livelihood outcomes in this business compared to those who produced superior products. For example, Herman happened to be one of the successful farmers because he produced crops such as beetroot, coat meal, red and yellow pepper which were rarely produced in the area. These crops were mostly sold in supermarkets and

big hotels, which means that a good price was fetched for the products compared to *Amaranthus* which was commonly produced and sold everywhere.

Also, crops like onions had guaranteed market because they could be easily stored after harvest until when the prices are favourable to the farmers. However, production and processing of these crops requires some skills. For instance, to process and preserve fresh produce successfully, the spoilage agents must be destroyed without ruining the nutritional value or palatability of the produce itself. This means that youth farmers' investment in human capital is inevitable for a successful business. It is also established that skills and competencies of youths do not meet the needs of today's agricultural sector (AGRA, 2015; Ahaibwe *et al.*, 2013).

Timing of crops production

The study findings show two production seasons; the first one involved seasonal production of vegetables and the second one involved production of the vegetables in all seasons. In the first category, there were youth farmers who strategically did most of their production in the dry season and some strategically produced in the rainy season. Herman produced during the dry season and seemed successful in the business. He fetched good prices for his produce because of the high demand in the market as during this season most farmers failed to produce due to their dependency on rain for farming. However, John produced in all seasons and happened to be even more successful. The disparity observed is explained by the fact that that, although all approaches worked well for the farmers, Herman could not tap the potential market opportunities which needed large volumes and constant supply throughout the year. This is because he worked individually. According to World Bank (2011) and Gabagambi (2011), if the smallholder farmers are to reach

economically viable volumes which can improve access to bulk buyers and increase profit aggregation of crops is necessary.

The second category of producers involved those who undertook vegetable production in the rainy season because of lacking other sources of water for production. Pendo and Daniel used this strategy and going by the experience of both it gives the impression that it is difficult to succeed in the business using this approach. This is because Dodoma is a semi-arid region hence rainfall is unpredictable and for this reason irrigation farming is necessary in the area. Implicitly, water is the most important strategic resource in the area as it reduces the risk of drought, increases yields and fetches higher income for the farmers. Mihailovic *et al.* (2014) also argued that expected yields in irrigation systems are higher than production without irrigation for around 30%, but also up to 100% in years with longer dry periods.

2.7 Conclusions and Recommendations

Production and marketing strategies are interlinked in such a way that production strategies are conditioned by market opportunities. This is reflected in youth engaging in production of crops which needed low investment mainly in order to minimize the risks associated with marketing. Timing in crop production, producing crops which are beyond the youth farmers comfort zone and beyond the production of traditional crops for market targets were important strategies associated with youths' success in vegetable farming. However, the youth produce vegetables with limited resources which affect the choices of their strategies. This is reflected in the usage of poor farming tools such as buckets used for watering vegetable gardens and dependence on rainfall which means vegetable production fluctuates with rainfall distribution. Apparently, for the youths to improve their access to potential market opportunities available, they need to employ strategies which could ensure

reliable supply of vegetables throughout the year. This, however, depends on the livelihood assets the youth possess. Hence, the challenge that they face is how to increase their livelihood assets because that could determine their choice of strategies.

The study, therefore, suggests that with some assistance from local government authorities, the youth should work together in viable economic groups or cooperatives. This will help them to be easily recognized for funding and trainings on better farming practices and entrepreneurial skills as most of facilitators require farmers to be in groups. This can also improve their bargaining power and improve access to bulk buyers through aggregation of crops and promoting their commodities as a team. However the formation of groups should consider the youth who have established themselves as vegetable producers for commitment purposes. This is because evidence (refer John's story) shows that the youth join farmer's organization with higher expectation not understanding that becoming successful in the business requires individual determination. The group only helps in achieving their dreams. Hence because it takes time to meet ones expectation especially when resources are limited these youth quit farming and weaken the organization. Moreover, the government should make sure that policy and legislation recognize the many facets of land rights and usage. This could make financing of agriculture attractive to the formal banking industry and will help the youth in the area to realize their ambitions in agriculture by accessing relevant modern farming technology through using their land as collateral.

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CHAPTER THREE

3.0 LIVELIHOOD OUTCOMES AND PERCEPTION TOWARDS VEGETABLE FARMING AMONG THE YOUTH IN TANZANIA: A CASE OF IHUMWA AND MTUMBA WARDS, DODOMA CITY

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3.1 Abstract

This article aims at determining the youths' perception of vegetable farming in relation to their livelihood outcomes in Ihumwa and Mtumba wards in Dodoma City. The study employed a cross sectional research design whereby a mixed methods research approach was adopted. Quantitative data were collected using a structured questionnaire while qualitative data from Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) were collected using interview guides. A 5 points' Likert scale was used to measure the youths' perceptions towards vegetable farming while improvement in livelihood outcomes was measured on a 3 points' Likert scale. Overall, 58.4% of the youths had high livelihood outcomes, while 53.6% of the youths had positive perceptions towards vegetable farming. Chi-square analysis revealed that there was statistically significant association ($\chi^2 = 138.0$ df = 4; p = 0.007) between different livelihood outcomes categories and the youths' perceptions towards vegetable farming. Spearman correlation coefficient findings indicated that there was a positive and statistically significant relationship between livelihood

outcomes and the youths' perception toward the enterprise ($r = 0.507$; $p = 0.000$). The study concluded that vegetable farming as a livelihood activity for the youths has the potential for improving their livelihoods and influence positive perceptions toward the sector. This is due to the fact the youth are attracted to production of fast maturing crops in order to make quick money and meet the desires of their lives. It is therefore urgent that, the government's efforts to engage the youth in farming should not be focused on agriculture as a livelihood activity per se but on specific agriculture enterprises. However, these should be the enterprises that generate income within a short period of time such as vegetable, fruits and green maize to mention a few. The local government in collaboration with the youth should identify high value vegetable in their areas and carve their niche in the markets as this will make farming more profitable for the youth and enable them to realize their ambition in farming. This information is useful for policy makers in agriculture and other key actors in formulating appropriate strategies to engage the youths in farming on a large scale by targeting agricultural enterprises which attract them.

Key words: Livelihood outcomes, perception towards vegetable farming, Dodoma City

3.2 Introduction

Vegetable farming has become an important asset of livelihood (Juma *et al.*, 2018; Ghimire *et al.*, 2018; Darkey *et al.*, 2014). It has supported the livelihood of farmers through income generation, promoting food security and reducing food expenses. In particular, vegetable farming is a source of employment for the youth especially in Africa, Asia and South America and a productive enterprise for cash generation due to high unemployment rate in these areas (Gurung *et al.*, 2016; Juma *et al.*, 2015; Gulamiwa, 2015; Ahaibwe *et al.*, 2013). In fact, pro-poor urban scholars argue that vegetable farming is more beneficial than cereal crops as it can help farmers generate cash even from a small area of land in a short

period of time (Rai *et al.*, 2019; Rutta, 2012). Therefore, vegetable farming since it is labour intensive has considerable potential for job and wealth creation and may absorb large numbers of youths who currently crowd the cities with underemployment and unemployment (Rai *et al.*, 2019; Dias, 2011).

Despite its importance and profitability, evidence shows that the youth are discouraged from engaging in farming. This is because of their negative attitude, perception and beliefs as well as inadequate farming resources such as land, and water for irrigation (Njeru, 2017; Noorani, 2015; Charles, 2014 and World Bank, 2014). Other scholars (Juma *et al.*, 2015; Leavy and Hossain, 2014) have pointed out that the youths generally regarded farmers as physical labourers who earn very little from agricultural production in comparison with formal and other informal sectors. As a result Africa's agriculture is predominantly done by the older (60 years and above) generation (Bhatta and Doppler, 2016). On the other hand, it has been realized that vegetable farming, unlike other agricultural commodities, can be practised profitably in both large and small scale. This is mainly because it requires minimal land space, little water for irrigation, readily available market and minimal chances of crop failure (Rai *et al.*, 2019; Mariyono, 2018).

According to Asongwe *et al.* (2014), Tanzania Horticultural association (TAHA) (2014) and Rutta (2012), the youth are attracted to production of fast maturing crops such as vegetables and fruits in order to make quick money to meet their daily life desires. Hence, there is need to examine the perceptions of the youth who choose vegetable farming to be their career in relation to their livelihood outcomes. Most studies conducted on youths' perception towards farming have focused on agriculture as a livelihood activity in general. In particular, Katel and Pelzom (2017), Charles (2014) and Luckey (2012) assessed youth perceptions and knowledge of agriculture. Douglas (2017), Njeru (2017) and Noorani

(2015) reported on the relationship between youths' perceptions and participation in agriculture, while Giuliani *et al.* (2017), Ayinde *et al.* (2016) and Anyidoho *et al.* (2012) looked into the youths' perceptions and aspirations in agriculture.

Thus, this study aimed at determining the youths' perceptions on vegetable farming in relation to their livelihood outcomes. More specifically, the study intended to answer the following research questions: 1) How is vegetable farming perceived among the youth? 2) What are the livelihood outcomes levels of the youth involved in vegetable farming and 3) How is youths' perception towards vegetable farming linked to their livelihood outcomes? The rest of the chapter is organized as follows. The theoretical framework is presented followed by a description of the methodology adopted for the study. Next, results are presented and discussed after which the conclusions of the study are drawn based on which recommendations are made towards the end of the chapter.

3.3 Theoretical Framework

This chapter was guided by the Sustainable Livelihood Framework (SLF) developed by DFID (1999) and the Social Cognitive Career Theory (SCCT) developed by Lent *et al.* (1994). Using the SLF, the chapter focuses on the livelihood outcomes. Livelihood outcomes are the achievements or outputs of livelihood strategies which are often the types of impacts that people are interested in (DFID, 1999). According to DFID (2001), livelihood outcomes are important to be established in terms of levels achieved in order to determine the impact of the livelihood strategies on the livelihoods that the people are engaged in. Hence, the livelihood outcomes addressed in this study are the changes in income, assets, food security and social network and human capital as a result of undertaking vegetable farming.

Despite the significance of the SLF in analyzing how livelihoods could be achieved through livelihood strategy it does not offer the grounds for analyzing the influence of livelihood outcomes on perception. This necessitated the use of social cognitive career theory in this study. Social cognitive career theory focuses on three cognitive personal variables namely self-efficacy, outcomes and goals (Lent *et al.*, 1994). This study focused on outcome expectations as beliefs about the consequences of performing particular activities. According to Lent *et al.* (1994), the choices that people make about the activities in which they will engage entail consideration of the expected outcomes. Nevertheless, people are more likely to choose an activity they perceive their involvement in will lead to valued, and positive outcomes in terms of tangible rewards such as income or social and self-approval. Positive outcomes lead to positive perception towards the activity and desired attitudinal change (Lent *et al.*, 1994).

Perception is defined in this study as a [belief](#) or [opinion](#), often [held](#) by many [people based](#) on how things [seem](#) to be (Smeets and Brenner, 2001). The theory serves as an interplay between livelihood outcomes and youth perception towards vegetable farming. As such, youths' negative or positive perception towards vegetable farming is associated with livelihood outcomes from the activity. However, the association between perception and livelihood outcomes is intervened by livelihood assets and institutions. Therefore, increased asset base may result in improved technologies and enhanced farming skills all of which improve productivity and hence, livelihood outcomes. On the other hand, if the youth fail to achieve the quality of life they desire, it may be because their desired outcomes conflict with institutions and policies governing their community or because they do not have the means (assets) to achieve them (DFID, 2001).

3.4 Methodology

The study was conducted in Ihumwa and Mtumba Wards in Dodoma City. Dodoma City is one of the fastest growing urban areas in Tanzania and where the growth of the urban informal sector is envisaged to continue. This makes the City strategically positioned for business due to increased population which increases the demand for vegetable both for household consumption but also for hotels and restaurants. Moreover, the recent government's decision to relocate its central administration from Dar es Salaam to Dodoma effective from September, 2016, would have an impact on both production and investments in agriculture including vegetable production.

The paper employed a cross-sectional research designs whereby a mixed methods research approach was adopted. The approach involves combining or integration of qualitative and quantitative research and data. This allowed the researcher to converge quantitative and qualitative data in order to provide a comprehensive analysis of the research problem (Cresswell, 2014). A two-stage sampling technique was used to select respondents. The first stage involved identification of production areas and all nine (9) production areas found in Ihumwa and Mtumba wards were covered. The reason for including all the production areas was to capture any difference in the livelihood outcomes of the youth that might be associated their production site. In Tanzania, one considered a youth is a person between the ages of 15-35 years (National Youth Development Policy, 2007). Hence, simple random sampling technique by using the lottery method was used in the second stage to select 276 farmers aged between 15-35 years whose main source of livelihood was vegetable farming. The sampling frame comprised a list of all vegetable farmers which prepared by the Ward Executive Officers was used in the selection of youth vegetable farmers. The sample size was determined by Yamane (1967) formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where: n = Sample size

N = Population size, and

e = Level of precision or sampling error, estimated in percentage (0.05).

Therefore, $n = 896/1+896(0.05)^2 = 276$, but the actual number of respondents used was 250 because 26 out of the 276 who were sampled were not available during the time of data collection. However this is 91% of the respondents.

Both primary and secondary data were collected. A structured questionnaire with closed and open ended questions was used to collect quantitative data on youths' livelihood outcomes and perceptions towards vegetable farming. Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) were used as the main methods of qualitative data collection. A checklist was used to gather data from 9 key informants (1 City Agriculture Irrigation and Cooperative Officer, 2 Ward Community Development Officers, 2 Ward Executive Officers, 2 agro-input dealers and 2 Ward Agricultural Extension Officers). Moreover, 9 focus group discussions (FGDs), each of which consisted of 9-12 youth farmers (Barbour, 2011), were held using an FGD guide. The instruments' validity was ascertained by agricultural extension experts and horticulturalists while a pilot test involving 30 youth farmers from Msalato Ward was conducted to determine the reliability of the instruments. The Chronbach's alpha was 0.76 which is above the 0.70 minimum acceptable for educational research at a significance level of 0.05.

Perception was measured using a Likert scale which comprised 10 statements. The study used a 5 points Likert scale (1 = strongly agree, 2 = agree, 3 = undecided, 4 = disagree and 5 = strongly disagree). Responses from all statements were combined to create a measurement of a perception scale (PS). PS is a single variable used to represent cumulative perception of attitude (Likert, 1932). Statements favourable to the construct

were positively worded while unfavorable statements used negative connotation. Then numerical values for the response options were reversed when calculating the overall score. The higher values indicated positive perceptions toward vegetable farming while low values indicated negative perceptions (i.e. unfavourably response) towards the enterprise.

However, before formulating the scale Principal Component Analysis (PCA) was used to identify variables that were used for formulating a perception scale. Factorability of variables using Bartlett's test of sphericity and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy were used. According to Pallant (2007), Bartlett's test of sphericity should be significant ($p < 0.05$) for the factor analysis to be considered appropriate. The KMO index ranges from 0 to 1, with 0.6 being taken as the minimum value for a good factor analysis (Tabachnick and Fidell, 2007). The overall KMO test for youth perception scale was 0.82 and the probability value for Bartlett's test was $p < 0.000$. Therefore, the sample was sufficient for further analysis for the study. However, of the 10 items subjected to the factor analysis, the communalities after extraction ranged between 0.263 and 0.865 (Table 3.1); which means that some items were below the cut-off point of 0.3. According to Pallant (2011), communalities give information on how much variance in each item is explained and a value less than 0.3 indicates that the respective item does not fit well with other items in its component. Therefore, two items with communalities below 0.3 were not selected for further analysis. The dropped statement included statement number six that says the post-harvest loss management techniques applied by the youth farmers are not sufficient to reduce loss and statement number nine that says buyers are satisfied with the quality of vegetable I produce.

Table 3.1: Communalities values for youth perception measurement after extraction

Statement	Initial	Extraction
There is adequate monetary gain from vegetable farming	1.00	0.645
Vegetable farming is not a respectable profession	1.00	0.785
Vegetable production can best be practised by the old and less educated	1.00	0.675
Vegetable production skills and abilities I possess are not sufficient for improving production	1.00	0.345
From vegetable farming I have managed to invest in other income generating activities	1.00	0.756
The post-harvest loss management techniques applied by the youth farmers are not sufficient to reduce loss	1.00	0.263
Access to inputs and marketing is poor in farming	1.00	0.456
All the time I have been in vegetable farming I have not been food insecure	1.00	0.865
Buyers are satisfied with the quality of vegetable I produced.	1.00	0.295
Vegetable farming has satisfactorily improved my standard of living	1.00	0.358

Hence, the respondents' responses from the remaining eight statements were added up to formulate the youths' perception scale (PS). The overall scores on the perception scale were categorized into positive, neutral and negative perceptions. The highest possible score was calculated by multiplying 8 statements by 5 points to get 40 points, while the middle point was calculated by multiplying 8 statements by 3 points to get 24 points, and the lowest possible score was calculated by multiplying 8 statements by 1 point to get 8 points. Therefore, 24 was the cut-off point and stood for neutral perception. Hence, scores from 8 to 23 on the overall scores were considered as negative perception whereas 25 to 40 stood for positive perception.

Livelihood outcome Index (LOI) was developed and used to measure whether engagement in vegetable production improved human capital, social capital, assets, improved household food security and household income. Each livelihood outcome indicator was measured by three sub-indicators which made a total of 15 sub-indicators as indicated in Table 5. These sub-indicators were measured on a three-alternative responses (low, medium and high livelihood outcomes), and the responses were coded as 1, 2 and 3 respectively. The overall score for each of the five indicators was established and these scores were used in

constructing the livelihood outcome index. The highest possible score for the five indicators were obtained by multiplying 3 by 15 to yield 45, while the mid value was obtained by multiplying 2 by 15 to yield 30 and the minimum possible score was obtained by multiplying 1 by 15 to yield 15.

Furthermore, the mid-cut value of 30 scores was coded as medium, 15 to 29 as low and 31 to 45 as high. The reliability of the index was checked by Cronbach's alpha (Field, 2009). Field (2009) suggests that, it is important to check the reliability of a scale and the most common measure of scale reliability is Cronbach's alpha. Reliability gives Indication of an instrument whether it can be interpreted consistently across different situations. Cronbach's alpha value ranges from 0 to 1.0 (De Vaus, 2002). Scholars suggest that a value of 0.7 to 0.8 is an acceptable value for Cronbach's alpha (Pallant, 2013; Field, 2009). The Cronbach's alpha for perception scale was 0.74 while for the livelihood outcomes was 0.76 which indicates that the research instruments were reliable. Descriptive statistics including frequencies and percentages were used to summarise the results by using IBM statistics. Chi-square was used to determine association between perceptions and livelihood outcomes among the youth involved in vegetable farming at 5% level of significance. Spearman correlation coefficient was used to measure the strength of the relationship between the two variables.

3.5 Results and Discussion

3.5.1 Socio-economic characteristics of the respondents in the study area

The study findings in Table 3.2 indicate that 66.0% of the respondents were aged between 31 and 35 years. This indicates that the respondents were in their prime ages and productive years which should positively affect farm size and earnings. Table 3.2 also shows that more than half (68.0%) of the respondents were males. This is due to the fact

that vegetable farming is a very tedious and labour intensive enterprise especially during weeding and irrigating times of plants in the dry season. To this end one of the youth female participants in the FGD said;

“We produce during the rainy season mainly because in dry seasons most of the wells we depend on for watering our crops dry up or remain with very little water which is deep in such a way that only men can manage to get it from there...”

(FGD of Mtumba, 17th March, 2017).

However, the finding that the majority of the respondents were male in the study area contradict the finding by Juma *et al.* (2018) who reported dominance of women in vegetable framing in Kenya. This could be because vegetable farming was not the main source of livelihood for the respondents in that study and most of them were not business owners. Hence it is normal find women as casual labourers in most farms in Africa because traditionally land belongs to men.

With regards to level of education, only 6% of the farmers had no formal education. High level of literacy portends a positive impact in farm development because education is an important personal trait for adoption of scientific agriculture.

Table 3.2: Socio-economic characteristics of youth farmers (n = 250)

Variable	n	%
Sex		
Female	80	32.0
Male	170	68.0
Education level		
No formal education	15	6.0
Primary	133	53.2
Secondary	102	40.8
Age (Years)		
15-20	17	6.8
21-25	32	12.8
26-30	36	14.4
31-35	165	66.0

3.5.2 Youth perception towards vegetable farming enterprise in Ihumwa and Mtumba

The study findings in Fig. 3.1 reveal that in general the youth had a positive perception towards vegetable farming as more than half (53.6%) of those interviewed demonstrated positive perceptions towards the enterprise. This is attributed to the fact that unlike other agriculture commodities vegetable farming helps the youth to improve their livelihood in a short period of time by generating cash even from a small piece of land. This observation featured in one of the interview with the key informant that:

“...given that Dodoma is a semi-arid region vegetable farming is more beneficial for the youth than other cereal crops since it requires little water for irrigation and has quick returns...”

(KI, 23rd August, 2017)

It is also revealed by other scholars such as Gurung *et al.* (2016), Foeken (2013) and Rutta (2012) that the youth are attracted to production of crops with short incubation period in order to make quick money.

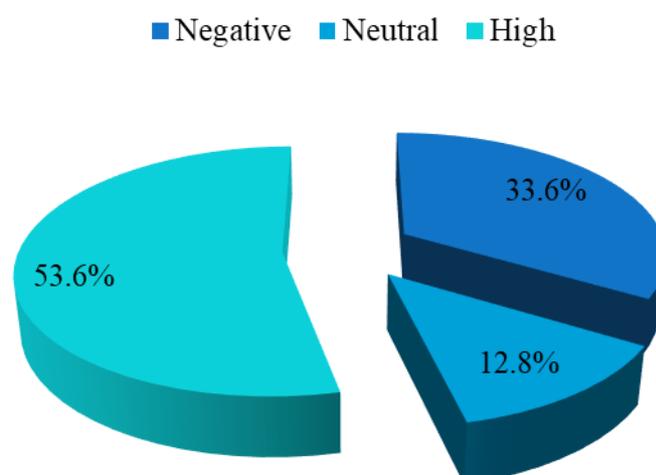


Figure 3.1: Categories of perception towards vegetable farming among the youth vegetable farmers

However, the statement-wise analysis of the youth perception toward vegetable farming presented in Table 3.3 indicates that respondents agreed with five perceptual statements

and disagreed with three which are worth noting for intervention. The table reveals that majority (93.2%) of the respondents disagreed with the statement that “vegetable farming can best be practised by the old and the less educated”. This is because there were many successful youth in vegetable farming in the area, who included both the educated and less educated. These, therefore, were seen as agents of positive change who motivate the youth to engage in the business while improving the image of the industry in their eyes. These results correspond with those of studies by Njeru (2017) and Leavy and Hossain (2014) who concluded that the presence of youths’ role models in agriculture influences the youths’ positive perception towards the sector.

Table 3.3: Distribution of youth in vegetable farming according to their perception of the enterprise (n = 250)

Statements	Disagree		Neutral		Agree	
	n	%	n	%	n	%
There is adequate monetary gain from vegetable farming	53	21.2	4	1.6	193	77.2
Vegetable farming is not a respectable profession	175	70.0	7	2.8	68	27.2
Vegetable production can best be practised by the old and less educated	233	93.2	15	6.0	2	0.8
Vegetable production skills and abilities I possess are not sufficient for improving production	69	27.6	15	6.0	166	66.4
From vegetable farming I have managed to invest in other income generating activities	105	42.0	5	2.0	140	56
Access to inputs and marketing is poor in farming	88	35.2	19	7.6	143	57.2
All the time I have been in vegetable farming I have not been food insecure	62	28.4	19	7.6	169	67.6
Vegetable farming has satisfactorily improved my standard of living	188	75.2	9	3.6	53	21.2

More than three-quarters (77.2%) of the respondents agreed with the statement that “there is adequate monetary gain from vegetable farming”. Implicitly, the amount of income obtained from vegetable sales has a positive bearing on the youths’ perceptions towards farming. This might be attributed to the fact that income from vegetable farming can be generated within a short time and the growing demand in city markets has diversified the

opportunities available for vegetable farmers. For example, in one of the FGDs, one member said;

" ...We are capable of running our families efficiently because we can produce vegetables even four times per year and generate income depending on the varieties that one produces ..." (Male participant in FGD held at Mtumba, 30th August, 2017).

The above quotation demonstrates how the youth are motivated by the quick money obtained from vegetable farming. Thus, if the income obtained from farming activities cannot meet the youths' quick demands; they are most likely to develop a negative perception towards the activity. Similarly, Oluwasola (2015) asserts that vegetable farming is very profitable with its income far exceeding the cost of production. In the same vein, Mariyono (2018) has asserted that profit from vegetable farming can increase the income of the farm households. Likewise, this is linked to the Social Cognitive Career Theory (SCCT) which argues that people are more likely to engage in an activity which leads to positive outcomes, and this develops positive perception towards the activity.

However, these results contradict with those by Njeru (2017) and Noorani (2015) who found that the youth perceived farming as being unprofitable; thereby leading to their negative perception towards the sector. This might be because these studies focused on the youth's perception on agriculture as a career generally and not on specific enterprises which the youths are engaged in. Hence, it is possible to find that the vegetable enterprise is considered lucrative among the youths because it meets their demands quickly. About three-quarters (75.2%) of the youth interviewed disagreed with the statement that "vegetable farming has satisfactorily improved my standard of living". This might be because it takes time to realize one's dreams especially when resources needed to succeed,

or even enter into farming as business, are not sufficient. For example, it was revealed in a male FGD conducted at Mtumba on 13th July 2017 that the youth vegetable farmers wished to establish their own food processing units and most of them were interested in modern technology based farming and market oriented farming which has not been attained by many. These results are similar to those by Proctor's (2012) argument that young people want to practise modern agriculture that uses more of technical skills and less energy to produce.

About 70% of the youths disagreed that "Vegetable farming is not viewed as a respectable profession in the society". This could be due to the fact that youth involved in vegetable farming have had their status in the community improved. For instance, when interviewed one of the government officials for Ihumwa Ward it was pointed out that;

"...Vegetable farming is an important livelihood activity in the area since it has really transformed many farmers' lives. Most of the children of vegetable producers wear good and clean uniforms at school..." (KI, 22nd August, 2017)

The above is in agreement with the findings by Leavy and Hossain (2014) who contend that status is very important in meeting the youths' aspirations in agriculture.

Achievement of food security in one's family is a basic outcome expectation from any livelihood activity; yet 28.4% of the respondents disagreed with the statement that "all the time I have been in vegetable farming I have not faced food insecurity". This is because most respondents were small scale producers (below 1 ha) and produced vegetables mainly during the rainy season because in the dry season most of the water wells they depend on for watering their crops dry up. Seasonal farming might lead to transitory food insecurity in some households due to decreased production which leads to low income for accessing food through purchase; hence, having a negative bearing on the youths' perception towards

vegetable farming. On the other hand, this also means that vegetable farmers in the study area cannot supply large buyers with sufficient quantities of their produce to make them attractive suppliers and sustain the market.

Almost two-thirds (66.4%) of the respondents agreed with the statement that “the farming skills and abilities I possess are not sufficient for improving production”. Low skills affect productivity, and this may lead to low livelihood outcomes which creates a negative perception towards farming among the youths. It was revealed in the FGD conducted at Mtumba on 13th July 2017 that most youth acquired vegetable farming skills from parents who were also vegetable producers. This could be a better explanation why they had low skills because, as perceptions, expectations, employment and technology in agriculture change, a revised set of skills is needed to address new challenges. This means also that developing mechanisms and offering platforms to improve extension services for effective dissemination of relevant agricultural knowledge and information plays an important role in improving the youths’ perception towards farming. In fact, for improved agricultural practices to be adopted and properly used, farmers must be supported by extension services. These results compare well to the findings reported by Douglas (2017) and Shireesha *et al.* (2016) who observed that, to improve the youths’ perception in farming, there is a need to bring noteworthy change in their farming by exploring updated knowledge and skills to make their farming more profitable.

More than a half (57.2%) of the interviewed youth agreed that “Access to inputs and marketing is poor in farming”. This means that ways of accessing agricultural inputs did not favour the youths’ prosperity in vegetable farming; thus, contributing to the negative perception towards it. Access to inputs is a critical factor in improving vegetable productivity and productivity is linked to market accessibility. High output improves access

to potential buyers who need large quantities of the produce and constant supplies. Achievement of this could lead to increased income and ultimately improved livelihoods and vice versa.

More than a half of the respondents (56%) also agreed with the statement that “From vegetable farming I have managed to invest in other income generating activities”. This reveals livelihood diversification has negative bearing on the youths’ perception towards vegetable farming and it is essential for improving the youths’ livelihoods. This finding is supported by the finding by Pelzom and Katel (2017) who assessed the youths’ perception towards agriculture and its potential for providing employment in Bhutan and Oluwasola (2015) who studied vegetable production, livelihood diversification and employment generation in Nigeria.

3.5.3 Levels of livelihood outcomes among the youth vegetable farmers

The current study established the levels of livelihood outcomes of the youth in vegetable farming, and the results in Fig. 3.2 indicate that more than a half (58.4%) of the respondents belonged to the high livelihood outcomes category. This means they scored 29 to 45 on the Livelihood Outcome Index (LOI). Implicitly, vegetable production as a livelihood strategy for the youth has helped to improve their livelihoods.

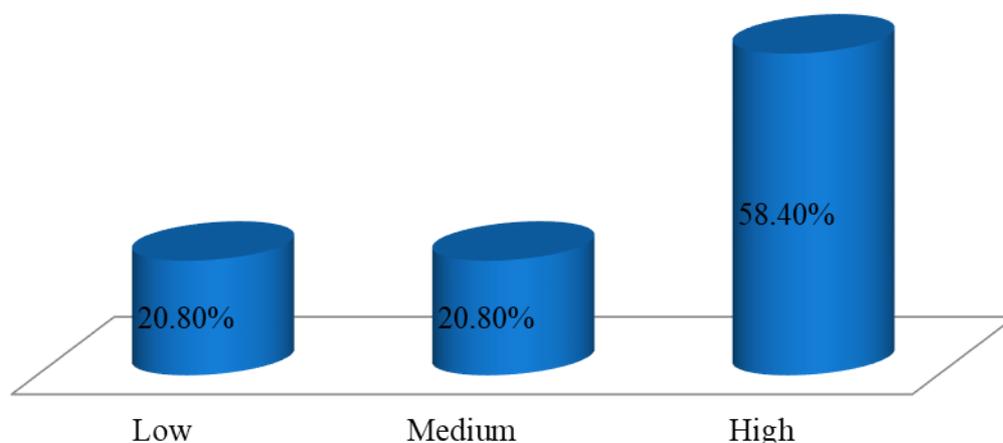


Figure 3.2: Overall livelihood outcome levels of the youth vegetable farmers

Moreover, Table 3.4 shows that increased household income ranked high (77.6%) among the livelihood outcomes achieved by the youth involved in vegetable farming in the study area. This might be because vegetable production was the primary occupation for the respondents, and they were the business owners. So, their interest in vegetable farming was more than subsistence as they were involved in farming to make a living out of it. Hence, they took advantage of innovations and prevailing economic opportunities aimed at enhancing farm income. For example, in a male FGD, one of the participants had this to say:

“...We normally organise ourselves during the rainy season to produce vegetables for Dar es Salaam market because during that period most of the vegetable farmers there don’t produce due to floods in swampy areas where they undertake their farming activities...”(FGD Male participants, Mtumba Ward, 30th August 2017).

Table 3.4 also indicates that improvement in human capital ranked low among the livelihood outcomes achieved. From the table, 61% of those who had not attended any training belonged to low livelihood outcomes category too. This implies that knowledge and information about best agricultural practices is very important in promoting production and entrepreneurial skills especially for the youths who wish to become agro-entrepreneurs. The table further shows that attending vegetable producers’ meetings was

the highly (39.6%) achieved among the three indicators used. However, in an FGD conducted at Mtumba on 28th August 2017, it was revealed that public meetings were meant for addressing common problems or outbreaks of vegetable diseases, which means that they had a small impact on individual farmer's performance in the enterprise.

Table 3.4: Percentage distribution of respondents according to improvement in livelihood outcome indicators (n = 250)

Indicators	Low		Medium		High	
	n	%	n	%	n	%
Improved assets						
Improving housing conditions	50	20.0	5	2.0	195	78.0
Improving household assets	49	19.6	2	0.8	199	79.6
Improved farm implements	53	21.2	4	1.6	193	77.2
Overall	56	22.4	2	.8	192	76.8
improved human capital						
Attending producer meetings involving cost	56	22.4	95	38.0	99	39.6
Attending training which require payments	61	24.4	102	40.8	87	34.8
Seeking advice from agric. extension experts	57	22.8	98	39.2	95	38.0
Overall	60	24.0	100	40.0	90	36.0
Improved food security						
Eating 3 meals per day	85	34.0	27	10.8	138	55.2
Eating kind of food you prefer	80	32.0	20	8.0	150	60.0
Reducing share of food	79	31.6	24	9.6	147	58.8
Overall	82	32.8	25	10.0	143	57.2
Improved social capital						
Access networking services	115	46.0	23	9.2	112	44.8
Increasing vegetable outlet	110	44.0	27	10.8	113	45.2
Participate in social activities by contrib.	98	39.2	34	13.6	118	47.2
Overall	112	44.8	28	11.2	110	44.0
Increased household income						
Saving income from previous season	45	18.0	12	4.8	193	77.2
Diversifying into other economic activities	49	19.6	15	6.0	186	74.4
Increased production	40	16.0	10	4.0	200	80.0
Overall	43	17.2	13	5.2	194	77.6

3.5.4 Association between livelihood outcomes and youths' perception towards vegetable farming

The findings presented in Table 3.5 show that the majority of the respondents with low level livelihood outcomes (88.5%) had negative perception towards vegetable production. As compared to other livelihood categories, the majority (71.2%) with high level of livelihood outcomes fell under high perception category. The chi-square findings further show that there was a statistically significant association ($\chi^2 = 138.0$ df = 4; p = 0.007)

between different livelihood outcomes categories and youths' perception on vegetable farming. Furthermore, correlation findings, from correlating the number of points scored on the scale of perception towards vegetable farming and the points scored on the livelihood outcome index, show that there was a positive and statistically significant relationship between livelihood outcomes and the youths' perception towards vegetable farming ($r = 0.507$; $p = 0.000$). As such, the more the one's livelihood improves, the more positive the youths' perception towards the enterprise. Similarly, Uaiene *et al.* (2009) argued that farmer's behavior is shaped by what they perceive would be the impacts of the livelihood strategy on their livelihoods.

Table 3.5: Association between levels of livelihood outcomes and youths perception

Levels of livelihood outcomes	Perception categories							
	Negative		Neutral		Positive		Total	
	n	%	n	%	n	%	n	%
Low	46	88.5	3	5.8	3	5.8	52	20.8
Medium	3	5.8	22	42.3	27	51.9	52	20.8
High	35	24.0	7	4.8	104	71.2	146	58.4
Total	84	33.6	32	12.8	134	53.6	250	100.0

$\chi^2 = 138.0$ df = 4; $p = 0.007$; $r = 0.507$; $p = 0.000$

The study findings above could be attributed to the fact that the vegetable farmers involved in the study were business owners (not casual labourers). They might have been motivated by the flexibility of producing vegetables for enhancing their own livelihoods; hence, treating vegetable farming more as a commercial activity rather than subsistence one. These findings agree with those by Douglas *et al.* (2017) which revealed that the amount of income obtained from the farm was statistically significantly related to the youths' perception towards farming with a positive relationship, with a unit increase in income contributing to increasing perception by a small margin. Additionally, Giuliani *et al.* (2017) argue that in areas where basic needs are met through farming, youth involved in agriculture would indeed prefer to develop their agricultural vocation. The findings from a

study by Gulamiwa (2015) and Juma *et al.* (2015) also showed that high income generating farming activities motivate young people to think positively about farming.

3.6 Conclusions and Recommendations

Evidently, the youth vegetable farmers in the study area had positive perception towards the enterprise as more than a half (53.6 %) of the respondents were categorized into positive perception category. However, this was mostly contributed by the quick return from the activity as evidence show that the youth are attracted to production of crops with short incubation period in order to make quick money. This was confirmed by the chi-square findings which show a statistically significant association ($\chi^2 = 138.0$ df = 4; p = 0.007) between different livelihood outcomes categories and youths' perception of vegetable farming. Correlation analysis further indicate a positive and statistically significant relationship between livelihood outcomes and the youths' perception towards vegetable farming ($r = 0.507$; p = 0.000). This means that the perceptions of the youth towards farming cannot be generalized since it is determined by the enterprise which the youth are engaged in. However, investing in farming activities which could generate income within a short period of time and the use of role models in the youths' perception towards farming appeared to be key areas of consideration.

The local government authorities, in collaboration with the youths, therefore, are urged to identify high income generating vegetable in their areas. This could be done by identifying high value crops and markets for the crops as this could guarantee their income and catalyse their interest in farming. Furthermore, the government, in collaboration with the youths and other development partners such as the input dealers, should come up with strategies to showcase the career paths of successful young farmers and agripreneurs as exemplary models to encourage the youths to engage in the agricultural sector. This could be done by putting in place a support structure like producer incentives for the youths participating in agriculture by organizing platforms for youth producers' competitions at

different levels (community, regional, national). Through these platforms, youth farmers could identify the right alternatives to overcome their structural barriers such as access to quality and affordable inputs and marketing collectively.

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CHAPTER FOUR

4.0 CONTRIBUTION OF VEGETABLE FARMING TO LIVELIHOOD OUTCOMES AMONG THE YOUTH IN IHUMWA AND MTUMBA WARDS, DODOMA CITY, TANZANIA

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4.1 Abstract

This paper examines the contribution of vegetable farming to livelihood outcomes among the youths in Ihumwa and Mtumba wards in Dodoma City. The paper employed a cross-sectional research designs whereby a mixed methods research approach was adopted. The approach involves combining or integration of qualitative and quantitative research and data (Cresswell, 2014). Quantitative data were obtained by administering interview schedules to the youth vegetable farmers while qualitative data from Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) were collected using interview guides. A livelihood outcome index was developed to measure the livelihood outcome levels of the youth involved in vegetable farming. The index sought to measure whether engagement in vegetable production improved human capital, social capital, assets, household food security and a household's income. Each livelihood outcome indicator was measured by three sub-indicators which were measured in a 3 point Likert scale (low, medium and high livelihood outcomes) and coded as 1, 2 and 3. Ordinal logistic regression model (OLRM) was employed to determine the chances of the youths' livelihood outcome

levels being high due to vegetable farming. This paper concludes that a greater proportion (58.4%) of the youth was categorized into the high livelihood outcomes. This means vegetable farming contributes highly to the livelihood outcomes of the youth. With regard to the factors contributing to this, the results from OLRM revealed that land size, access to credit, vegetable variety and education were the most significant ($p \leq 0.05$) predictors of the livelihood outcomes. Thus, it is recommended that the government in collaborations with other development partners and the youth address these factors when designing intervention for improving the livelihoods of youth engaged in vegetable farming.

Key words: Livelihood outcomes, vegetable farming, youths, Tanzania

4.2 Introduction

Agriculture is Africa's major economic sector whereby it supports the livelihoods of 70-80 percent involved in agriculture (Brooks *et al.*, 2013). A number of scholars therefore strongly argue that, in many African countries, only the agricultural sector has sufficient scale and growth-linkages to significantly provide employment and sustainable livelihoods for the youths (Agricultural Non-State Actors Forum, ANSAF, 2016; Brooks *et al.*, 2013; Diao *et al.*, 2010). This is because the wage sector of employment where most of the youth seek employment cannot absorb the large number of job seekers, estimated to be between 10 to 12 million per year (Alliance for a Green Revolution in Africa (AGRA), 2015; International Labour Organisation (ILO), 2013). In Tanzania, for instance, the youth account for 67 per cent of the labour force and each year 900 000 young Tanzanians enter the job market that is generating only 50 000 to 60 000 new jobs annually (United Republic of Tanzania (URT), 2016). This implies that, in Africa, the main challenge is not just one of creating jobs in the wage sector but creating productive livelihood activities for the youth in agriculture. Some scholars have gone even further to observe that the horticultural sector

is attractive to the youth since even those with a minimal land space can secure a decent livelihood (Foeken, 2013; Rutta, 2012; Proctor *et al.*, 2012). Moreover, the incubation period for vegetables is rather short as compared to annual or perennial crops (Tanzania Horticultural Association, TAHA, 2014).

To harness the potential of agriculture in Tanzania, several policy strategies have been put in place to create a favourable environment for the Tanzanian youth establishing their livelihoods in agriculture. Some of these strategies include formulation of *Kilimo Kwanza* strategy (URT, 2009), whose 8th pillar is science, technology and human resources development. Through this pillar the strategy aimed at providing agricultural loans and land to entrepreneurial agricultural graduates so as to retain them in agriculture. In 2011, Sokoine University of Agriculture (SUA) launched Sokoine University Graduate Entrepreneurs Cooperative (SUGECO) to provide entrepreneurship skills that could enable its graduates to engage in agriculture. Similarly, the 2013 National Agriculture Policy underscores the importance of facilitating access to productive resources including labour saving technologies, surveyed land and irrigation infrastructure for the youth to engage in agriculture as a livelihood activity (URT, 2013).

Furthermore, efforts are also reflected in the 2016-2021 National Strategy for youths' involvement in agriculture which emphasizes on promoting decent livelihoods in the agricultural sector. These strategies have had appreciable impact as a number of the youths have resorted to various kinds of income generating activities in agriculture particularly vegetable production (Agboola *et al.*, 2015; Oluwasola, 2015; Gulamiwa, 2015; FAO, 2013; Njenga *et al.*, 2012; Rutta, 2012). Despite the appreciable impact of the strategies and interventions, the extent to which such engagement in vegetable farming improves youths' livelihood is hardly known in Tanzania. Consequently, this paper sought to

determine the contribution of vegetable farming to livelihood outcomes of the youth in Dodoma City. More specifically, the paper describes the socio-economic characteristics of vegetable producers, determines the levels of livelihood outcomes achieved among the youth and assesses the contribution of vegetable farming to livelihood outcomes among the youths. The findings are expected to contribute to the design of relevant youth policies, support programmes and interventions for engaging the youth in farming.

4.3 Theoretical Framework

This paper draws on the sustainable livelihoods framework (DFID, 1999). It argues that the way to improve livelihood outcomes of the poor people is to build around understanding of five principal categories of livelihood assets (physical, human, financial, natural, and social). This means that realization of desired livelihood outcomes depends on people's access to different types of assets and their ability to put these to productive use. For example, when personal characteristics such as farming skills, experience and knowledge increase, people can raise productivity through adopting better farming practices and improve their livelihoods. Also, the more the youth farmers are connected with others in formal and informal groups, the better they understand the rules and opportunities for participation. Natural resources such as land and water, when accessible, can raise production through expansion of farm size and irrigation farming. Financial assets including savings (cash as well as liquid assets) and credit (formal & informal), when accessible, can also enhance production and productivity through purchase of inputs and labour saving tools. Lastly, physical infrastructure and technology including roads and communications means between consumers and producers are important for marketing of products (Lemke *et al.*, 2012).

Synergies exist among assets such that building on one asset can increase the value of another asset. For example, land ownership as collateral provides access to financial resources such as loans (Muyanga *et al.*, 2013). The converse is also true, restricted access to one's asset can limit one's ability to access others. However, youth farmers possess these assets to varying degrees sometimes driven by personal choice or traits such as age, sex and at other times by forces outside individual control (Mazibuko, 2013). Also, the structures and processes of the community and society to which the youth belong shapes livelihood both by determining who gains access to which types of assets, and defining what range of livelihood strategies are open and attractive to people for their livelihood outcomes (Krantz, 2001). Hence, the SLF is considered relevant for this study owing to its strength in explaining how the livelihood outcomes of the youth could be achieved through vegetable farming and how the livelihood assets they possess contribute to varying outcome levels of livelihood among them.

4.4 Methodology

The study was carried out in Ihumwa and Mtumba Wards in Dodoma City. The two wards were selected for the study out of the City's six wards that are prominent for vegetable farming. The other wards are Msalato, Veyula, Mpunguzi and Hombolo. Dodoma City is one of the fastest growing urban areas in Tanzania and where the growth of the urban informal sector is envisaged to continue. In fact, the population of the area was estimated to have increased from 398 798 in 2012 to 700 000 in 2017 (URT, 2018). Moreover, Dodoma is a semi-arid region characterized by a long dry season starting late April to early December, and a short single rainy season starting December to mid-April. The average rainfall is 500mm annually, and about 85% of this rains in the four months between December and March (Agriculture Census, 2014). Being a semi-arid region, agricultural

production is largely unreliable due to the scarcity of rain. Hence, farmers go to an extra mile by engaging in vegetable farming and so do the youths

The paper employed a cross-sectional research designs whereby a mixed methods research approach was adopted. The approach involves combining or integration of qualitative and quantitative research and data (Cresswell, 2014). Contradictions or incongruent findings are explained or further probed in this approach. This allows the researcher to converge quantitative and qualitative data in order to provide a comprehensive analysis of the research problem (Cresswell, 2014). A two-stage sampling technique was used to select respondents for the study. The first stage involved identification of production areas and all nine (9) production areas found in Ihumwa and Mtumba wards were covered. The reason for including all the production areas was to capture any difference in the livelihood outcomes of the youth vegetable farmers that might be associated with their production sites.

The population for the study consisted of all the vegetable farmers in Ihumwa and Mtumba Wards. The sampling frame which comprised a list of all vegetable farmers prepared by the Ward Executive Officers was used in the selection of youth farmers. In Tanzania, one considered a youth is a person between the ages of 15-35 years (URT, 2007). Hence, simple random sampling technique by using the lottery method was used in the second stage to select 276 farmers aged between 15-35 years whose main source of livelihood was vegetable farming. The sample size was determined by employing Yamane (1967) formula, which is:

$n = \frac{N}{1 + N(e)^2}$, where: n = Sample size, N = Population size and e = Level of precision or sampling error, estimated in percentages (0.05). Therefore, $n = \frac{896}{1 + 896(0.05)^2} = 276$

The actual number of respondents used was 250 because 26 out of the 276 who were sampled were not available during the time of data collection. However, this is more than 90 percent of the required respondents.

A checklist was used to gather data from 9 key informants (one City Agriculture Irrigation and Cooperative Officer, two Ward Community Development Officers, two Ward Executive Officers, two agro-input dealers and two Ward Agricultural Extension Officers). Moreover, nine focus group discussions (FGDs), each of which consisted of 9-12 youth farmers (Barbour, 2011), were held using an FGD guide. The instruments' validity was ascertained by two agricultural extension experts and two horticulturalists. The experts confirmed that the research tools contained items that would solicit the intended responses on the contribution of vegetable farming to the livelihood outcomes of the youth. Also, the experts reviewed the items for clarity and ensured that all items which could confuse respondents and research assistants were removed or rephrased for clarity. A pilot test involving 30 youth farmers from Msalato Ward was conducted to determine the reliability of the instruments. The Chronbach's alpha was 0.76 which is above the 0.70 minimum acceptable for educational research at a significance level of 0.05.

A considerable amount of transcripts from interviews and FGDs were transcribed and coded into emergent themes and analysed using the content analysis method (Mayring, 2014). Descriptive statistics, including frequency counts, means and percentages were used to describe the socio-economic characteristics of respondents by using IBM SPSS.

Livelihood outcomes were measured by developing a livelihood outcomes index. The index sought to measure whether engagement in vegetable production improved human capital, social capital, assets, household food security and household income. Each

livelihood outcome indicator was measured by three sub-indicators which made a total of 15 sub-indicators as indicated in Table 4. These sub-indicators were measured on a three points Likert scale (low, medium and high livelihood outcomes) and coded as 1, 2 and 3. The overall score for each of the five indicators was found, and these scores were used in developing the livelihood outcome index. The highest possible score for the five indicators was obtained by multiplying 3 by 15 to yield 45, while the mid value was obtained by multiplying 2 by 15 to yield 30 and the minimum possible score was obtained by multiplying 1 by 15 to yield 15. So, the mid-cut value of 30 scores was coded as medium, 15 to 29 low and 31 to 45 high.

Ordinal logistic regression analytical model was used to determine the likelihood of the youth livelihood outcome levels being high due to vegetable farming. The reason for using ordinal regression model was due to the fact that the dependent variable was measured at the ordinal level in terms of ranked alternative responses (High level = 2, medium level = 1 and low level = 0 of livelihood outcomes) (Pallant, 2013). Explanation of the overall output from the model, among other things, focused on p-values at $p \leq 0.05$ which was considered to be statistically significant for testing the significance of the effect; coefficients for measuring the directions of livelihood outcomes to higher or low category and the value for individual coefficients as indicated by a positive or negative sign. A positive sign associated with an indication of a coefficient variable that increases the probability of being grouped in the category of high level of livelihood and vice versa. The odds ratio (Exp (B) values) explained the chances for the outcome variable to occur subject to a predictor variable or when a predictor variable is increased by one. Wald statistics allied with measuring the strength of the influence on livelihood outcomes. The independent variables included socio-demographic variables as indicated in the ordinal logistic regression model below. The ordinal logistic regression model used in this study, which is presented in Equation (1), was adopted from Agresti and Finlay (2009) and is as follows:

$$P(Y) = e^{\alpha + \beta_1 X_1 + \dots + \beta_k X_k} \dots \dots \dots \text{Equation (1)}$$

$$1 + e^{\alpha + \beta_1 X_1 + \dots + \beta_k X_k}$$

Where: $P(Y)$ = the probability of the success alternative occurring, e = the natural log, α = the intercept of the equation, β_1 to β_k = coefficients of the predictor variables, and X_1 to X_k = predictor variables entered in the ordinal regression model. Specifically in this study: $P(Y)$ = the probability of the youth being grouped in high level of livelihood outcomes; α = the intercept of the equation; $\beta_1 \dots \beta_k$ = Regression coefficients; $X_1 \dots X_k$ predictor or independent variables entered in the model, which were: X_1 = age of respondent (measured in years), X_2 = education level of respondents (0 = No formal education, 1 = Primary education), X_3 = Farming experience (measured in years), X_4 = Access to credit (Accessed 1, 0 otherwise), X_5 = Farm size (measured in ha), X_6 = Marital status (Married 1 and 0 otherwise), X_7 = vegetable variety (improved 1, 0 traditional) X_8 = Land ownership status (1 own, 0 hired) X_9 = Sex (Male 1, Female 0) X_{10} = Marital status (Married 1. Otherwise)

4.5 Results and Discussion

In the first part of this section the socio-economic characteristics of youths involved in vegetable farming are described followed by the determination of the levels of livelihood outcomes for the youth in vegetable farming. The last part presents the determinants of livelihood outcome levels achieved by the youth vegetable farmers.

4.5.1 Socio-economic characteristics of youths' vegetable farmers in Ihumwa and

Mtumba

4.5.1.1 Age, sex and level of education

The socio-economic characteristics of the youth vegetable farmers are presented in Table 4.1. The table shows that the highest (80.4 %) age frequency of the youth vegetable farmers fell within the 26 - 35 years age bracket, while only 19.6% of them were in the age group 15 – 25 years. The reason for having low percentage of the youth in age group 15-25 is

because at tender ages a lot of options are still at the youths' disposal; hence, they cannot make concrete decisions on whether to farm or not. To this end, in a male FGD, one of the participants said:

"...We have different goals and plans; some of us are here to get some cash and go back to school and pursue other career opportunities available..." (FGD Mtumba, 29th March, 2017).

Girei and Giroh (2012) affirm that the level of involvement in farming tends to increase with the optimum age group and similarly starts to drop with increase in age. The table also shows that slightly more than two-thirds of the youth involved in vegetable farming were males (68%). The difficulties faced by women to inherit land due to cultural factors might have contributed to the difference as the study revealed that more than half (54.4%) of respondents inherited land from family. In Tanzania, customary practices often require women to access land through their fathers, brothers, husbands or other men relatives who control the land (Moyo, 2016).

The study findings (Table 4.1) also show that only 6% of the respondents lacked formal education. This implies that the majority (94%) of the respondents were literate so able to acquire information on appropriate technologies for agricultural production from various sources such as brochures, newspapers, leaflets and posters. Educational status is an important personal trait as it tells an individual's level of understanding and comprehension of the government's policy and strategies aimed at enhancing farm output, income and farmers' livelihood. In the female FGD conducted at Ihumwa, one of the members had this to say:

"We don't know if there is any agricultural extension officer in the area. For appropriate use of inputs, we read instructions from the labels of the products and share information among ourselves..." (Female FGD participant Ihumwa, 30th July 2017)

According to Douglas *et al.* (2017) and Kimaro *et al.* (2015), literate farmers are more knowledgeable about current technologies for better production than illiterate farmers.

4.5.1.2 Marital status and household size

Table 4.1 shows that the majority (84.8%) of the respondents were married. Marriage entails some kind of responsibility including providing food for the family. This result was affirmed by one KI in Mtumba who said:

“Marriage is a very important institution here. It is used as a criterion for a man to be assigned a portion of land for vegetable farming by his family or father” (KI Mtumba).

This was the reason why most couples have at least a portion of land for vegetable farming. The table also indicates that the mean household size of the respondents was 4.3 persons while the minimum and maximum household sizes were one (1.0) and seven (7.0) persons respectively. Further, the study findings show that the greatest proportion of the households had family sizes from three (3) to four (4) persons which is below the national mean of 4.9 persons (NBS, 2013). The small size of the household contributes to enhancing savings, but could also adversely affect farm operations if household members provided the main source of labour. Given that vegetable farming is a labour intensive activity, one will be forced to rely on hired labour and these results in increasing investment costs on it. For example, in a female FGD at Ihumwa, one of the participants claimed;

“Vegetable farming is very paying for men because they get enough time to take care of their gardens, unlike women most of who are supposed, all the time, to balance child care with production” (FGD with women held at Ihumwa, 18th July 2017).

Table 4.1: Socio-demographic characteristics of youth vegetable farmers (n = 250)

Variable	n	%
Sex		
Female	80	32.0
Male	170	68.0
Age (Years)		
15-25	49	19.6
26-35	201	80.4
Education level		
No formal education	15	6.0
Primary	133	53.2
Secondary	102	40.8
Marital status		
Single	23	9.2
Married	212	84.8
Divorced	5	2.0
Land acquisition		
Inherited	136	54.4
Bought	70	28.0
Rented	44	17.6
Farm land size (acre)		
Below 2.6 (1ha)	196	78.4
Above 2.6	54	21.6
Experience in farming (years)		
Less than 5	43	17.2
5 – 10	67	26.8
More than 10	140	56.0

4.5.1.3 Land ownership status, farm land size and experience in farming

Table 4.1 shows that more than half (54.4%) of the vegetable farmers acquired land for farming through inheritance, followed by those who bought (28%) theirs and only small proportional (17.6%) of respondents rented theirs. This implies that the youth farmer's farm size is determined by what plot of land is allocated to him or her. However, evidence shows that access to farming land for personal projects has an impact on youths' welfare in agriculture because there is limitation to the type of activities that they could be involved in on the family land or as tenants. In an interview, one of the KI interviewees pointed out;

“In the African tradition, the youth usually farm on their parents' land until when the parents die or decide to allocate a piece of land for each child. The situation has a negative bearing on the youths' perception towards farming since it limits

their flexibility to plan activities and budget for their incomes.” (KI, 3rd July, Dodoma City official).

The findings are in line with those by the International Fund for Agriculture Development (IFAD), (2011) which argue that land tenure issues affect every day’s choices for farmers on the extent to invest on the land or to adopt new technologies and innovations.

More than three-quarters (78.4%) of the respondents had land whose sizes was below 1 ha (2.6 acres). This is not far from expectation as even with a small portion of land a descent livelihood can be realised from vegetable farming. This finding supports that of Ngegba *et al.* (2016) who found that a large proportion of the vegetable farmers cultivate less than 1 ha of land. The results in Table 4.1 also show that more than half (56%) of the respondents had been in the farming business for more than ten years. The mean years of farming experience were 10.8 years. This implies that the majority of the respondents had been long enough in the business. This is an important factor for understanding the technicalities involved in vegetable production and marketing which is important in determining both the quantity of the yields and the levels of livelihood outcomes. Findings by Oluwasola (2015) support this result by pointing out that the majority of vegetable farmers in Oyo State Nigeria had a farming experience of more than ten years and that was sufficient to know how to produce cost effectively. Likewise, the more an individual gets experienced in farming, the more they realize the benefits and become aware of the importance of the industry (Agboola *et al.*, 2015; Oluwasola, 2015).

4.5.1.4 Main types of vegetables produced

The study findings in Table 4.2 reveal that the most preferred vegetable crop is *Amaranthus*. This is because it requires little investment in terms of time, labour and inputs

as within one month it can be mature enough to be picked. On the other hand, beetroot that could earn one more money only about a third of the youths grew it. The reasons behind limited involvement of the youth in production of these types of crops are many as summarised by participants in a FGD as follows;

“Beetroots are very profitable; they are sold at about TZS 5 000/= per kg at market places, but growing them needs a lot because seeds are very expensive, and it requires one to sacrifice everything to take good care of them because they are easily infested” (FGD participants Ihumwa, 30th August 2017).

In the same vein, coat meal was lowly produced though it seemed paying as a bunch of five to seven leaves could be sold at TZS 500/= in the market. The plausible explanation for its low production could be because the product was not commonly consumed and most of the farmers in the area depended on the local market. It follows that the types of crop produced by the youth had implications on their vegetable enterprises and ultimately on their livelihood outcomes.

Table 4.2: Types of vegetable mainly produced by the youth (n = 250)

Vegetable type	Frequency	Percentage
<i>Amaranthus</i>	138	55.2
Chinese cabbage	126	50.4
Tomatoes	124	49.6
Onions	94	37.6
Beetroot	87	34.8
Coatmeal	58	23.2
<i>Mnafu</i>	57	22.8

*Multiple responses

4.5.2 Levels of livelihood outcome levels among the youth vegetable farmers

Figure 4.1 shows that more than half (58.4 %) of the respondents scored 31 to 45 on the livelihood outcome index (LOI) scale that was used and thus categorized as belonging to the high livelihood outcomes category. These findings indicate that involvement of the

youth in vegetable farming had a significant impact on their livelihood outcomes. The results can be explained by increased market opportunities for vegetable producers following the rapid expansion of urbanization in Dodoma. According to Rai *et al.* (2019), vegetable farming has become an important asset of livelihood for the youth surrounding cities. Ibidapo *et al.* (2017) and Gurung *et al.* (2016) also argue that vegetable farming has become an important asset of livelihood and poverty reduction for the youth as it supports food provision, income generation and employment for the youth. Likewise, Rai (2017) stated that vegetable farming has a positive impact on the livelihood and socio-economic conditions of the farmers.

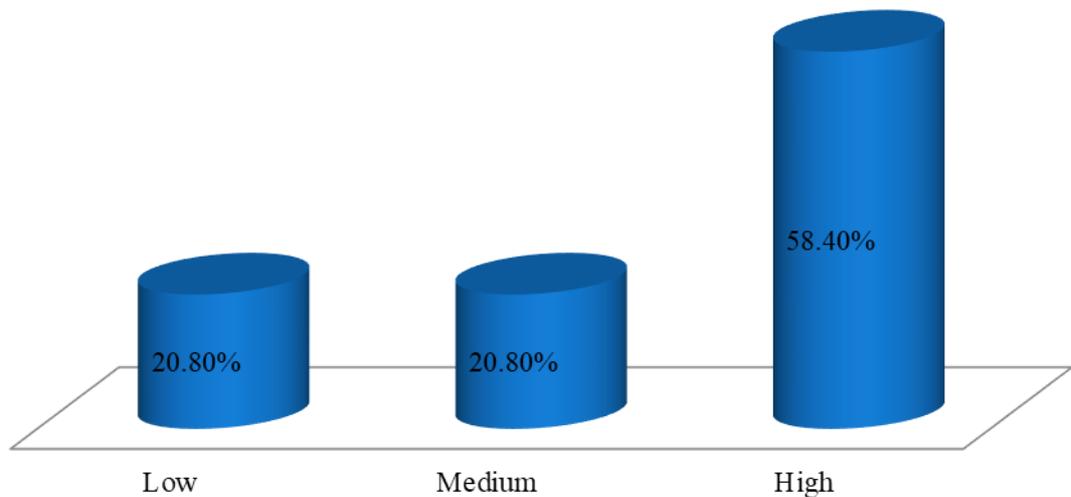


Figure 4.1: Levels of livelihood outcomes among the youth vegetable farmers

The analysis of individual indicators of livelihood in Table 4.3 shows that increased income and improved assets ranked high among the five indicators as 77.8% and 76.6% of the respondents scored between 31 and 45 respectively on the LOI.

Table 4.3: Percentage distribution of respondents according to the improvement on livelihood outcome indicators (n = 250)

Indicators	Low		Medium		High	
	n	%	n	%	n	%
Improved assets						
Improving housing conditions	50	20.0	5	2.0	195	78.0
Improving household assets	53	21.2	4	1.6	193	77.2
Improved farm implements	49	19.6	2	0.8	199	79.6
Overall	56	22.4	2	0.8	192	76.8
Improved human capital						
Attending producer meetings involving cost	56	22.4	95	38.0	99	39.6
Attending training which require payments	61	24.4	102	40.8	87	34.8
Seeking advice from agric. extension experts	57	22.8	98	39.2	95	38.0
Overall	60	24.0	100	40.0	90	36.0
Improved food security						
Eating kind of food you prefer	85	34.0	27	10.8	138	55.2
Eating 3 meals per day	80	32.0	20	8.0	150	60.0
Reducing share of food	79	31.6	24	9.6	147	58.8
Overall	82	32.8	25	10.0	143	57.2
Improved social capital						
Access networking services	115	46.0	23	9.2	112	44.8
Increasing vegetable outlet through networks	110	44.0	27	10.8	113	45.2
Participate in social activities by contribution.	98	39.2	34	13.6	118	47.2
Overall	112	44.8	28	11.2	110	44.0
Increased household income						
Saving income from previous season	45	18.0	12	4.8	193	77.2
Diversifying into other economic activities	49	19.6	15	6.0	186	74.4
Increased production	40	16.0	10	4.0	200	80.0
Overall	43	17.2	13	5.2	194	77.6

In particular, on average the youth vegetable farmers in Ihumwa and Mtumba had net monetary value of TZS 1 824 100 million per season (Table 4.4). These results are attributed to the fact that the incubation period for vegetables is rather shorter compared to the annual or perennial crops; so, it motivated the youths to work innovatively in order to earn more cash. For example, one male FGD participant said:

“...We prepare to produce mainly during the dry season in order to fetch good prices for the produce. During this season, there are few vegetable in the market as most farmers don't produce due to their dependency on rain for their vegetable production...” (FGD Ihumwa 12th August, 2017).

The study findings (Table 4.3) further show that improved human capital and social capital ranked low among the indicators of livelihoods analysed in this study. This means that

majority of the respondents scored 15 to 29 under these indicators on the LOI. This could be because farmers were likely to invest the profits accrued from their farms in the purchase of inputs and other equipment that would assist them to maintain their farms than investing it in other aspects of their livelihoods such as attending trainings.

Table 4.4: Percentage distribution of youth vegetable farmers by income obtained per season (n=250)

Income categories	Frequency	%
less 1 000 000	69	27.6
1 000 000-1 999 999	107	42.8
2 000 000 and above	74	29.6
Average: 1 824 100		

On the other hand, the level of livelihood outcome of individual youth farmers is also dependent on the extent to which they are entitled to or lay claim to livelihood assets. This is evidenced by the OLRM results in Table 4.5 which show that factors such as access to credit, land size and level of education were very important in improving youths' livelihood outcomes. Hence, this conforms to the SLF that those endowed with livelihood assets are more likely to be able to make positive livelihood choices (Carney, 1998).

Table 4.5: Determinants of livelihood outcomes levels among youth vegetable farmers

Variable	B	SE	Wald	Sig.	OR
Sex (Reference female)	0.428	0.413	1.075	0.300	1.53
Marital status (Reference Married)	-0.526	0.690	0.582	0.446	0.59
No formal education (reference secondary)	-2.155	1.295	2.769	0.046	0.12
Primary education (Reference secondary)	-0.176	0.830	0.045	0.832	0.84
Farm land size	0.200	0.028	50.640	0.000	1.12
Experience on veg. production	0.021	0.037	0.332	0.564	1.02
Age	-0.007	0.013	0.302	0.583	0.31
Access to credit (No access)	0.101	0.244	0.17	0.031	1.11
More improved varieties (Reference more trad)	0.005	0.072	7.291	0.007	1.01
Land ownership (Reference hired)	0.697	0.315	4.893	0.027	0.71

2 Log Likelihood (Intercept Only = 393.226, Final = 217.252) p = 0.000, Goodness of Fit = 1, Cox and Snell = 0.596, Nagelkerke = 0.691

4.5.3 Factors determining livelihood outcomes realized in vegetable farming

Using the Ordinal Logistic Regression Model, the study examined the variables that played a great effect on the chances of the livelihood outcomes of the youth vegetable farmers being high. The model is relevant in prediction of dependent variables with greater than two categories measured at ordinal level of measurement (Agresti and Finlay, 2009). Livelihood outcomes were measured as low, medium and high levels of livelihoods. Therefore, the OLM was appropriate to determine the influence of independent variables on the livelihood outcomes of youth vegetable farmers. The model fitting information showed statistically significant chi-square ($p \leq 0.05$) indicating the presence of association between the dependent variable (livelihood outcomes) and a combination of the independent variables that were entered in the model; hence, the model gave better predictions of the outcome categories. The Cox and Snell Pseudo R-Square was 0.596 while the Nagelkerke Pseudo R-Square was 0.691, implying that 59.6 to 69 percent of variation observed in youths' livelihood outcomes was explained by a combination of the independent variables entered in the model. The 2 Log Likelihood (Intercept only = 393.226, Final = 217.252) implies that additional independent factors improved the model.

The results presented in Table 4.5 indicate that four out of ten independent variables (land size, access to credit, vegetable variety and education) were the most significant factors on influencing youths' livelihood outcomes in vegetable farming ($p \leq 0.05$). Size of land under vegetable farming had a positive beta coefficient (0.200) and it is significant ($p \leq 0.05$). This implies that, as the farm size increases, the probability of farmers being categorized in high livelihood outcome level increases. The odds ratio for land size is 1.22, meaning that for a unit increase in vegetable farm size by 1 Ha increases the odds of moving from low to higher livelihood categories by 1.22, with the other variables in the model being held constant. This might be attributed to the fact that most of these farmers had not invested

much on human capital notably farming skills and improved technology as such the improvement in their livelihood is achieved by cultivating more land. This is in consonant with Machimu (2017) who established that with low farming technology, smallholder sugarcane farmers' net income in Kilombero Valley to a large extent depended on the land size cultivated. Furthermore, a report by IFAD (2011) demonstrates that due to little improvement in factors of production agricultural growth in African countries is generally achieved by cultivating more land and mobilising a larger agricultural labour force which produces very little improvement in yields.

The study findings in Table 4.5 further show that production of more improved vegetable varieties had a significant impact on youths' livelihood outcomes. The beta coefficient (0.005) for production of more improved varieties is positive and statistically significant ($p \leq 0.05$). This means production of more improved vegetable varieties increases the probability of the youth attaining high livelihood outcomes. The odds ratio for production of more improved varieties also signifies that production of improved varieties increases the likelihood of the youth being categorized in high livelihood outcomes by 1.01. This could be due to high yield and resistances to pests and diseases. A study by Juthathip *et al.* (2014) affirms that farmers get higher household income from the adoption of improved or hybrid varieties of the vegetable crops. A study by Oluwasola (2015) concluded that production of the improved vegetable varieties has high impact on productivity and wellbeing of smallholder farmers.

Furthermore, the results (Table 4.5) show positive beta coefficient (0.101) for access to credit and it is statistically significant ($p \leq 0.05$). This implies that access to credit increase the probability of being in one of the higher categories of livelihood outcome. The odds ratio of 1.11 implies that respondents who accessed credit were 1.11 times more likely to

be in the higher livelihood category than those lacked access. This could be because, with insufficient financial investment it becomes difficult for the youth vegetable farmers to meet production costs such as purchasing inputs and improved farm equipment.

The negative coefficient (-2.155) on no formal education indicates that youth vegetable farmers with no formal education were most likely to be found in low livelihood outcomes level. Moreover, the odds ratio revealed that the chances of those with no formal education were 0.12 less likely to be categorized in high livelihood outcomes compared to those with secondary education. Literature (Agboola *et al.*, 2014; Amrouk *et al.*, 2013) shows that educational level has positive implication on farmers' livelihood outcomes. However, these results contradict the findings by Naamwintone and Bagson (2013) who established that farmers do not need any formal education. This might be because education seems to have higher payoff to productivity in modern than in traditional agriculture and that the youth want to practise modern agriculture that uses more of technical skills. For example, one of the government officials for Dodoma City said:

“...It is not surprising for uneducated youth to complain that vegetable farming is not paying because they prefer technology oriented kind of farming over the traditional way of farming which they consider stressful but technology requires some sort of formal education...” (KI, 30th August, 2017).

In a related finding, Oduro *et al.* (2014) reported that education has two main effects on agriculture, “worker effect” and “allocative effect”. Worker effect is when an educated farmer, given the same number of inputs, can produce a greater output compared with the uneducated one. With allocative effect, a worker is able to acquire information about cost and characteristics of inputs and interpret the information to make decisions that will enhance output. This has been the case with current study as the more educated were able

to employ better farming strategies and produce vegetable cost effectively because they had sufficient information about marketing and other opportunities available

4.6 Conclusions and Recommendations

Based on the above findings and discussion, it is concluded that vegetable farming is an activity that can uplift the livelihood of the youth more than half (58%) of the respondents had attained high level of livelihood outcomes. However, a weak impact of vegetable farming was noted in improved human and social capital in such a way that improvement in the livelihoods of the youth can only be achieved by cultivating more land. Therefore, the challenge they face is how to improve these assets for them to be able to adopt better farming skills and improved technology and ultimately realise their ambition in vegetable farming industry. Moreover, the results from the OLRM revealed that land size, access to credits and educational level had strong effect and positive implication on the youths' livelihood outcomes in vegetable farming. It is, therefore, recommended that the government, in collaboration with other development partners and youths' farming schemes when designing intervention for improving the livelihoods of the youth engaged in farming, should target their different segments based on their capabilities. This could be done by considering how youths access funds for working capital, farming land size and education of the farmer which were found to be more significant factors in determining youths' livelihood outcomes in vegetable farming.

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CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of major findings

The current study aimed at determining the influence of vegetable farming on the livelihoods of the youth vegetable farmers in Mtumba and Ihumwa wards, Dodoma City. The study focused on the livelihood outcomes of these youth given the high unemployment rate and the fact that agriculture has been said to be the only sector that has sufficient scale and growth-linkages to significantly provide employment and sustainable livelihoods for the youth. Hence, the major findings of this study which are used as the basis for recommendations are highlighted in the following sub-sections.

5.1.1 Strategies used in vegetable farming

Manuscript one in chapter two of this study discussed production and marketing strategies used by the youth in vegetable farming in order to address the first objective. This objective was guided by SLF whereby the livelihood assets possessed by the youth were viewed as a tool for guiding their choices of production and marketing strategies. The findings show production and marketing strategies are interlinked: production strategies are conditioned by market opportunities for example, the youth engaged in production of crops which needed low investment mainly in order to minimize the risks associated with poor market. Moreover, working under limited resources, compelled some youth to venture into survival strategies. This is reflected in producing under rain fed conditions and production of crops which are within their comfort zone. Great dependence on rainfall means that farmers' vegetable yields and production in general, fluctuate with rainfall distribution. The current study also established that the strategies used by the youth differed depending on the type of assets they were entitled to. For example, those with strong network appeared to have access to reliable

markets for their produce and could easily access funds for working capital. Hence, the finding conforms to SLF argument that those endowed with assets are more likely to be able to make positive livelihood choices and ultimately improved livelihoods.

5.1.2 Livelihood outcomes and perception towards vegetable farming

Youths' perception towards vegetable farming in relation to their livelihood outcomes is discussed in manuscript two (Chapter three). This chapter draws on the Sustainable livelihood Framework (SLF) and the Social Cognitive Career Theory (SCCT). Improved livelihood outcomes from vegetable farming are viewed as catalyst for the youths' positive perception towards the activity and desired attitudinal change. As such, youths' negative or positive perception towards vegetable farming is associated with livelihood outcomes achieved from the activity. The study found that a greater proportion of the youth in Ihumwa and Mtumba who had high livelihood outcomes had positive perception towards vegetable farming too. Furthermore, the results show that majority of the respondents with low livelihoods (88.5%) had negative perception towards vegetable farming. As compared to other livelihood categories, majority (71.2%) of respondents with large livelihood outcome fell under high perception category. This was confirmed by the chi-square findings which revealed a statistically significant association ($\chi^2 = 138.0$ df = 4; $p = 0.007$) between different livelihood outcomes categories and youth perceptions on vegetable farming.

Furthermore, correlation findings, from correlating the number of points scored on the scale of perception towards vegetable farming and the points scored on the livelihood outcome index, indicated that there was a significant and positive relationship between the livelihood outcomes categories and youths' perception towards vegetable farming ($r = 0.507$; $p = 0.000$). As such, the more the livelihood improves, the more positive is the

youths' perception towards the farming enterprise. Likewise, this is linked to the Social Cognitive Career Theory (SCCT) which postulates that people are more likely to engage in an activity which leads to positive outcomes, and this develops positive perceptions towards the activity. The study further indicates that investing in farming activities which could generate income within a short period of time and the use of role models in youths' perception towards farming appear to be key areas of consideration.

5.1.3 Livelihood outcomes and their determinants among youth vegetable farmers

The livelihood outcome levels of the youth involved in vegetable farming is discussed in manuscript three (chapter four). Specifically, the manuscript addresses the third and fourth specific objectives of the main study. Using quantitative and qualitative methods, paper three explored the way livelihood outcomes are achieved through vegetable farming, and determined the variables that played a great effect on the livelihood outcomes of the youth vegetable farmers. The manuscript was guided by the SLF whose assumptions are based on three interrelated dimensions namely livelihood assets, livelihood strategies and institutional structures which influence one another to produce or undermine the livelihood outcomes. The study findings show that more than a half of the vegetable farmers in Ihumwa and Mtumba wards have attained high levels of livelihood outcomes. However, as pointed out in the DFID's sustainable livelihood framework, there was a variation of the influences of different variables on the likelihood for the youth to attain high livelihood level. This was affirmed by the results from the ordinal logistic regression analysis which showed that land size, access to credit, vegetable varieties produced and education level were the most significant factors in influencing youths' livelihood outcomes in vegetable farming ($p \leq 0.05$). Land size indicated positive ($\beta = 0.200$) with strong association (Wald=50.640) on the livelihood outcomes levels achieved by the youths in Ihumwa and Mtumba wards. This implies that youth vegetable farmers land size used is an important

determinant factor associated with livelihood outcomes. Access to credit facilities appeared to have a positive association on the youths' livelihood outcomes in vegetable farming. Education level had negative influence. Despite the fact that vegetable farming was found to be lucrative, a substantial proportion of the youth were still at low level of livelihood outcomes, notably in the human and social capital. As such, these issues need to be addressed in interventions to promote the youths' involvement in agriculture in Tanzania.

5.2 Conclusions

5.2.1 Production and marketing strategies used by the youth vegetable farmers

The current study shows that vegetable farming is a potential livelihood activity that can improve the livelihood of the youth and reduce unemployment rate due to its quick return nature. Particularly evidence show that production and marketing strategies are interlinked in such a way that production strategies are conditioned by market opportunities. This is reflected in youth engaging in production of crops which needed low investment mainly in order to minimize the risks associated with marketing. Moreover, working under limited resources, compelled some youths to venture into survival strategies such as producing under rain-fed conditions and production of crops which are within youth farmer's comfort zone. Great dependence on rainfall means that farmers' vegetable yields and production in general, fluctuate with rainfall distribution.

5.2.2 Livelihood outcomes and youth perception towards vegetable farming

The present study also indicates that the youth vegetable farmers in the study area had positive perception towards the enterprise. This was confirmed by the fact that majority of respondents with low livelihoods (88.5%) had negative perception as compared to other livelihood categories, majority (71.2%) of respondents with large livelihood outcome fell under high perception category. However, this was mostly contributed by the quick return

from the activity as evidence show that the youth are attracted to production of crops with short incubation period in order to make quick money. This means that the perceptions of the youth towards farming cannot be generalized since it is determined by the enterprise which the youth are engaged in.

5.2.3 Contribution of vegetable to livelihood outcomes among the youth

Generally, vegetable farming contributes highly to the livelihood outcomes of the youth as more than half (58%), attained high level of livelihood outcomes. However a weak impact of vegetable farming was observed on improved human and social capital indicators. The analysis shows that even a small increase in farming skills can contribute significantly to production and productivity as 61 percent of the youth who did not attend any training fell into low livelihood category. This means that improvement in the livelihood outcomes of the youth vegetable farmer can only be achieved by expanding land under cultivation in order to increase vegetable production. Moreover, the observed differences on the livelihood outcomes among the youth indicate that improvement in the livelihoods of individual youth farmers depend on the extent to which they are entitled to or lay claim to livelihood assets. This was affirmed by the results from OLRM. In addition to estimating the extent to which vegetable farming contributes to the livelihood outcomes of the youth, this study highlights some of the constraints to vegetable farming that might have limited the youth to realize their ambition in farming. Consequently, the challenge facing vegetable farming in Dodoma city is to generate technologies or innovations that best reflect the obtaining production and marketing environment.

5.3 Recommendations

Based on the study findings and conclusions the study advances the following recommendations in order to enhance the youths' participation in vegetable farming and

suggest how to undertake vegetable farming enterprise for attaining the desired livelihood outcomes in the study area and other areas in Tanzania with similar contexts.

5.3.1 Improving youths' production and marketing strategies

Based on the conclusion that the youth were working under limited resources and therefore compelled to venture into survival production and marketing strategies, the youth are, advised to take initiative in improve their livelihood assets particularly human and social capital. This could be done through consulting experts such as agricultural extension officers, horticulturists or those from different agricultural research and attending training on appropriate farming practices and entrepreneurial skills. On the other hand, with some assistance from the local government authorities and other development partners, the youth should be encouraged to form or join schemes or clubs. This will ease access to financial institutions for funding and other agricultural opportunities available. This can also improve their bargaining power and access to bulk buyers through aggregation of their crops and promoting their commodities as a team. However formation of farmers' organization should consider the youth who have established as vegetable farmers for commitment purposes.

Moreover, the government of Tanzania, through the local government authorities in collaboration with the youths, should organize a platform for youth producers' competitions at different levels (community, regional, national) to attract more youths into the agriculture industry. Through these platforms, the youths can strategize on how to overcome barriers such as inaccessibility to quality and affordable inputs and collective marketing.

5.3.2 Enhancing youths' perception towards vegetable farming

The study findings show that investing in farming activities which could generate income within a short period of time catalyses youths' positive perception towards farming. Hence the local government, in collaboration with the youth and other development partners should identify high value vegetable in the area and identify prospective markets for these products to catalyze the youths' interest in farming. In the same vein, higher value vegetable should be produced in demonstration areas to show the youth farmers how to improve their farming skills and generate adequate income. Furthermore, the government, through the Ministry of Agriculture, Food Security and Cooperatives and the Ministry of Labour, Employment and Youth Development, should put in place a support structure like producer incentive for all the youth participating in agricultural production. This could be done by arranging lucrative markets for their produce both within and outside the country. This will help them realise their ambition in vegetable farming and ultimately improve their perception towards the sector.

Given that the use of role models in influencing the youths' perception towards farming appears to be a key area of consideration, the local government, in collaboration with the youth and other development partners, should come up with appropriate strategies to showcase the career paths of successful young farmers and agripreneurs as exemplary models to motivate the youth while improving the image of the industry in their eyes

5.3.3 Livelihood outcomes in vegetable farming and their determinants

It was observed that while land size, access to credits, and production of improved varieties had positive influence on youths' perception towards vegetable farming the level of education exert a negative influence on it. Therefore, the government through the Ministry of Agriculture, Food Security and Cooperatives, in collaboration with the local government

authorities and other development partners, should set up appropriate infrastructure for the youth involved in vegetable farming. For example, the City should set aside land specifically for the youth projects as well as set up irrigation schemes since Dodoma is a semi-arid region. Also, the current advanced technology which guarantees higher production and productivity should be promoted among the youth vegetable farmers in order to increase their income and ultimately improve their livelihood outcomes. The government, through the Ministry of Constitutional Affairs and Justice and policy makers should ensure that policy and legislation recognize the many facets of land rights and usage by speeding up and blending the current land formalization programme with the creation of awareness on tenure security. This could make financing of agriculture attractive to the formal banking industry and will ultimately help the youth to realize their technology modernized farming desires by using their land as collateral.

Given that a substantial proportion of the youth are still at low level of livelihood outcomes in terms of human and social capital, the local government should partner with research and academic institutions such as Sokoine University of Agriculture to equipping the youths with farming and entrepreneurial skills to enable them to adopt new technologies which could guarantee them higher productivity so increase production.

5.3.4 Areas for further research

The study recommends the following areas which were not covered in this study for further research:

- i. This study did not look into other factors which are depicted to have influence on livelihoods outcomes by the sustainable livelihoods framework. Therefore, future studies should focus on the influence of institutions, policies, organizations and external contexts such as technology, demography and seasonality.

- ii. Youths' perception towards vegetable farming in other areas. This will generate more indicators to enable policy makers to improve and implement appropriate intervention programmes in improving their perception towards the sector.

- iii. A comparative study of vegetable farming with farming of other crops. This will help to identify other enterprises which could catalyse the youths' interest in farming.

APPENDICES

Appendix 1: Interview schedule used for the research

Dear Respondent,

My name is, I am currently doing a study on Youth Employment in Agriculture and Livelihood Outcomes. Overall goal is to have data or information for developing a PhD study. The information provided shall be treated with utmost confidentiality and will only be used for the purpose of the study and not otherwise. You have been chosen by chance to participate in this study and there is no correct or wrong answer. Your participation is voluntary, but your experience could be very helpful to other youths and the government.

A. FARMERS IDENTIFICATION

S/No	Item	Response
1.	Date of interview	
2.	Questionnaire No.	
3.	Name of interviewer	
4.	Name of respondent	
5.	Education level	
6.	Marital status	
7.	Hamlet	
8.	Ward	

B. FARMERS BACKGROUND VARIABLES

Please fill the responses in the space provided.

9. Household composition

S/N	Member/ Name	Sex	Age	Relationship to household head	Highest level of education	Main occupation	% Contribution of main occupation to household income/ monthly

10. For how long have you lived in this village? _____ (years/ months)

11. Are you a native/were you born in this village? yes/no

12. If not when (year) did you move to this village? _____

13. What prompted you to come to this place? 1) vegetable production, 2) others (specify) _____

C. INFORMATION ON CROP PRODUCTION

14. For how long have you been in vegetable farming? (specify number of years)

15. What are the main types of vegetable do you grow?
 1)
 2)
 3)
16. What type or varieties do you grow? 1= More Improved, 2= More local, 3= Both
17. If you are growing local varieties, are you not aware of the improved varieties? (If not aware, go to question 19), 1= Not aware, 2= Aware
18. If aware and not using them, what are the reasons? 1. High price 2. Vulnerable to diseases 3. Not readily available 4. Common traditional practices 5. Others (specify)
19. If you are growing both local and improved varieties which one yields more?
 1= Improved 2= Local
20. Are seeds or planting materials available? 1- Yes, 2= No
21. Where do you get planting materials/seeds? 1= Own nursery 2= Other farmers 3= buy from shops 4= Others (Specify).....
22. Can adequate supplies be obtained when needed from the mentioned source? 1= Yes 2= No
23. Are they of adequate quality? 1= Yes, 2= No (If yes, go to question 25)
24. If not of adequate quality, why do you think so?.....
25. Summarize the problems occurring at farming which may affect quality/ quantity of the product. 1..... 2..... 3.....
26. Has the average vegetable produce changed overtime? 1= increases, 2= decreased, 3= fluctuating
27. Please give reasons (for the response given above)

D. FARM SIZE AND LAND HOLDINGS

28. What is the size of your vegetable land?.....acres
29. Is all the land you own in one plot? 1=Yes 2= No
30. If no, show their size and ownership status in the table below

Plot No	Plot size (acre)	Ownership status 1. Inherited (Indicate the year). 2. Bought (amount in TZS) & year 3. Rented (amount in TZS) per year	Average earning per month in TZS
1			
2			
3			
4			

4.	Equipment							

46. Which of the following farming practice is mostly influencing the produce quality? /quantity production. (Rank and give reasons for each)
1. planting pattern
 2. Irrigation
 3. weed control
 4. fertilization
 5. field sanitation
 6. Others

F. KNOWLEDGE ON VEGETABLE PRODUCTION

47. How did you acquire the knowledge/skills in vegetable production? 1. Formal institution 2. Friends/Family 3. Other farmers
48. If from formal institution, name of the institute and types of training.
49. Was there any payment for the training/advice?
50. If yes, How much?
51. Do you seek agriculture advice? Yes/ No
52. If yes, from whom? 1. Ward Agriculture Extension officer
2. Neighbors/ Friends
3. Others (specify) _____
53. If no, why? _____

G. VEGETABLE MARKET

Buyers

54. To whom do you sell vegetables? (circle one) 1= home consumers, 2= hotel and restaurants, 3= supermarkets, 4= Small Traders in the municipal 5= Vegetable processors, 6= Big traders in the municipal 7= All of the above, 8= any other customers (specify) _____
55. How far is the market where you sell your vegetable? i) Buyers come in my garden ii) Less than 1 km ii) 2-5 km iii) 6-10 km iv) More than 10 km
56. What are the terms of payments? (Circle one) 1= Cash terms only, 2= Credit terms, 3= in advance. 4= both of the above, 5= others (specify)
57. Who determines the price of vegetables? 1= Producer, 2= Traders, 3= Other (Specify).....
58. How is the price determined?.....
59. Do you charge different prices to different buyers? 1= Yes, 2= No. (If no, go to qn 63)
60. If yes, give reason.....
61. What major factors do you consider when you decide to sell your produce? 1= price offered, 2= personal tie with middlemen, 3= honesty from buyers, 4= Others (Specify).....
62. Do you have any information pertaining other markets? (circle one)..... 1=Yes, 2=No
63. If yes, how far from those market? (circle one) 1= rural markets.....km 2= urban markets.....km(If no, go to qn 68)
64. How do you obtain/get such pieces of information?..... 1= Direct visit to market, 2= Cross check with many middlemen/agents/ buyers, 3= Hear from neighbors and friends 4= Hear from mass media, 5= other sources (specify).....
65. How do you take advantage of such information?
66. Have you been able to increase customers for the past three years? 1=yes 2=No

67. If yes, please show market trends for the past three years. (in the table below)

Markets trend for farmer's vegetable

S/No	Farmers outlet	2013	2014	2015	2016	2017
1	Local market					
2	Small Traders in the municipal					
3	Big traders in the municipal					
4	hotel restaurants supermarkets					
5	Big traders outside the municipal					
6	Farmers association					

68. Are you satisfied with the following services offered by your vegetable buyers?

S/N	Service	1. Yes 2. No 3. Neutral	If Yes, why?	If No, why?
1	Price			
2	Weighing procedure			
3	Payment time			
4	Communication in case of payment delay			
5	Market information reliability			

Grading

69. Do you sell vegetable in different grades? (e.g small/big bunches, good quality/bad)? (circle one) 1= Yes, 2= No

70. If yes what criteria do you use in sorting?.....

71. Do local, regional or national standards exist for sorting?.....1= Yes 2=No

72. Does the present method of grading appear to affect the following 1)= quantity of produce available for market? 1= Yes 2= No 2) Value of produce available for sale 1=Yes 2= No 3) quality of produce available for sale.

73. If yes, explain.....

74. Does the volume of produce unsuitable for market appear to be: 1= High 2= Medium 3= low?

Packaging

75. How is the produce packed for marketing?

76. Are packages reused or recycled?

77. Does the present method of packages appear to affect the following: i) quantity of produce available for market? 1= Yes, 2= No, ii) quality of produce available for market? 1=Yes, 2= No, iii) value of produce available for market? 1= Yes, 2= No

78. If Yes, explain.....

79. Does the volume of produce unsuitable for marketing appear to be: 1= High, 2= Medium, 3= Low?

Storage

80. Do you store your vegetable before selling/ for later sales in the season? 1= Yes, 2= No

81. If yes, for how long is the produce stored? (circle one) 1= 1-3 days, 2= 4-7 days, 3= more than one week, 4= others (specify)

82. In what type of storage facility? (mention)

83. If no, why?

84. Is the storage structure used to store vegetable after harvesting 1. modern 2. traditional

- 85. Does the present storage facility appear to affect the following: i) quantity of produce available for market? 1= Yes, 2= No, ii) quality of produce available for market? 1= Yes, 2= No, iii) value of produce available for market? 1= Yes, 2= No
- 86. If yes, please explain.....
- 87. Does the volume of produce unsuitable for marketing appear to be: 1= High, 2= Medium, 3= Low?
- 88. Summarize the problems occurring at harvest which may affect marketing of the product.
 1..... 2..... 3.....
 4.....

Transportation

- 89. How do you deliver your products? 1= Own transport, 2= Hired transport, 3= None of the above but customers come to buy at production premises, 4= Others (specify)_____
- 90. What distance is the produce transported from farm to market? _____km.
- 91. Which means of transport do you use? (tick means of transport alternatives and costs involved)

Means of transport	Owned	Hired(TZS/Unit)
Bicycle		
Oxcart		
Motorbike		
Lorry/truck		
Other		

- 92. What are the conditions of the roads? 1= Poor, 2= good
- 93. Does the present method of transport appear to affect the following: quantity of produce available for market? 1= Yes, 2= No, quality of produce available for market? 1= Yes, 2= No, value of produce available for market? 1= Yes, 2= No.
- 94. If yes, please explain
- 95. Does the volume of produce unsuitable for market appear to be: 1= High, 2= Medium, 3= Low?

96. Which are most serious problems affecting the performance of vegetable production?

Rank	Problem relating to government policy	Problem relating to marketing system	Personal problem
1			
2			
3			

Government policy problems: 1= Very high tax rate, 2= unnecessary by-laws formulated by local government, 3= importation of vegetable products from other areas, 4= other (specify).....

Market system problems: 1= Poor infrastructure facilities such as transport, feeder roads, 2= lack of market, 3= poor quality of vegetable, 4= high transport cost, 5= lack of appropriate technologies, 6= Others (specify).....

Personal problem: 1= Lack of working capital, 2= lack of experience, 3= limited labor force, 4= others (specify).....

97. Please indicate the route cause and possible solutions for the most critical problem listed above.

Problem	code	Route cause	Possible solution
1. Government policy			
2. Marketing system			
3. Personal			

98. In your own opinion, suggest the kind of immediate and long-term improvement that should be undertaken to improve the marketing systems of vegetable in Tanzania _____

H. FARMERS ORGANISATION

99. Are you a member of any farmer’s organization? 1. Yes 2. No

100. If No, Why?

101. If yes, what are the benefit do you get? (Rank the alternatives as per your understanding)

1. Technical supports
2. Farm inputs supports
3. Transportation arrangements support.....
4. Financial supports
5. Extension service supports
6. Training supports
7. Others (specify)

102. Which activities have you participated in vegetable producer’s association group?

- (i) Leadership
- (ii) Attending meetings
- (iii) Giving financial contribution
- (iv) Others (specify)

103. How many times have you attended in the association meeting last year?

- (i) One
- (ii) Twice
- (iii) Three to six times
- (iv) More than six times

104. Who are the decision-makers in the association? 1. Leaders
 2. All members 3. Other (specify)

105. Are you satisfied with the following services offered by your farmers organization?

S/N	Service	1. Yes 2. No 3. Neutral	If Yes, why?	If No, why?
1	Price negotiation			
2	Credit facilitation			
3	Farm inputs facilitation			
4	Extension service			
5	Market search			
6	Transportation			
7	Payments follow up			
8	Skills enhancement training			

106. What are your opinions regarding the conditions in terms of enabling people to join farmers association? 1. Too tough 2. Reasonable..... 3. Easy.....

107. What is your view regarding vegetable producer’s association membership growth?
 1. Increasing.....2. Declining 3. stagnant

108. Please give reasons for the response given above

- (i)
- (ii)
- (iii)

109. What do you consider to be the major obstacles towards effective participation of members in the association activities?

- (i)
- (ii)
- (iii)

110. What is your general view concerning the management of your farmers’ association service?

- 1. Well managed
- 2. Not managed well

111. If not well managed, why?

112. What are your general views about vegetable farmers’ association with respect to the following issues? -

- (i) Group management/leadership
- (ii) Financial management.....
- Economic performance
- (iii) Goal achievement
- (iv) Leadership accountability
- (v) Implementation strategies

I. ACCESS TO FINANCIAL RESOURCES

113. Have you received any loan/credits for vegetable production? 1. Yes 2. No
114. If no, how did you get your business capital? 1= Own saving 2= family 3= other
115. If yes, from which institution/ organization? 1. Bank 2. Microfinance(examples) 3.Private lenders 4.others (specify) _____
116. What type of loan did you get? 1. Cash 2. Input 3.Other
117. Are prevailing market interest rates at level that allows you to repay the loan and still make a profit? 1= Yes, 2= No (explain).....
118. Do you get any constraints in receiving loan/credits? 1= Yes 2=No
119. If, Yes, Please mention main constraints. 1.....2.....
120. How do you cope with the mentioned constraints above?
121. Apart from credit facilities, what other facilitating services are available to vegetable producers? (for example: 1= inputs, 2= technical advice, 3= extension services, 4= subsidies etc.) (Please tick which is appropriate and mention the institute)
122. What are your views concerning financial services provided for the youth engaged in farming?

J. INSTITUTIONAL ARRANGEMENT

123. Are there any laws, regulations, incentives or disincentives related to production or marketing the produce? (example: existing price supports or controls) 1= Yes, 2= No
124. Are there any organization involved in youth projects related to production or marketing the vegetable? 1= Yes, 2= No

K. PERCEPTIONS ON VEGETABLE PRODUCTION

125. For each of the following statements indicate whether the respondents 1= Strongly agree 2= agree, 3= undecided, 4= disagree and 5= strongly disagree

Statements	Responses				
	1	2	3	4	5
There is adequate monetary gain from vegetable farming					
Vegetable farming is not a respectable profession					
Vegetable production can best be practised by the old and less educated					
Vegetable production skills and abilities I possess are not sufficient for improving production					
From vegetable farming I have managed to invest in other income generating activities					
The post-harvest loss management techniques applied by farmers is not sufficient to reduce loss					
Access to inputs and marketing is poor in farming					
All the time I have been in vegetable farming I have not been food insecure					
Buyers are satisfied with the quality of vegetable I produced.					
Vegetable farming has satisfactorily improved my standard of living					

L. LIVELIHOOD OUTCOMES AMONG THE YOUTH VEGETABLE FARMERS

126. For each Indicator indicate to what extent vegetable farming had delivered the expected livelihood benefits

Indicators	Responses		
Improved Assets	Lowly	Moderately	Highly
Improving housing conditions			
Improving household assets			
Improved farm implements			
improved human capital	Rarely	Frequently	Most frequently
Attending producer meetings which involving cost			
Attending training which require payments			
Seeking advice from agric. extension experts			
Improved food security	Rarely	Frequently	Most frequently
Eating 3 meals per day			
Eating kind of food you prefer			
Reducing share of food because there was no enough food			
Improved social networks	Lowly	Moderately	Highly
Access networking services			
Increasing vegetable outlet through networks			
Participate in social activities which require contribution.			
Increased household income	Lowly	Moderately	Highly
Saving income from previous season			
Diversifying into other economic activities			
Increased production			

127. Apart from vegetable farming what other income generating activities do you do?

1.....2..... 3.....

128 For each activity mentioned indicate what percentage it contributes to the household income

Activity No.	Percentage
1	
2	
3	

M. FARMERS EXPECTATIONS AND FUTURE PLANS

129. What benefits did you expect from vegetable farming? 1.....2.....3.....

130. What benefits have you achieved which you think couldn't have been possible without engaging in this business??

1.
2.
3.
4.

131. Have you invested the benefits in other activities?

1. No
2. Yes

132. If yes, mention the activities

- (i)
- (ii)
- (iii)
- (iv)

133. If no, why you have not managed to invest in other activities? (Give reasons)

- (i)
- (ii)
- (iii)

134. Are you satisfied with the benefits you have achieved?

- 1. No
- 2. Yes

135. If no, why?

.....
.....

136. Do you think you still need to continue with vegetable production?

- 1. No
- 2. Yes

137. If yes, what are the most important factors that keep you in farming? (Rank answers as per order of importance)

- 1
- 2
- 3

138. If no, what do you expect to do instead of vegetable farming?

Thank you for your cooperation!

Appendix 2: Checklist of items used for focus group discussion and in-depth interview

Strategies used in vegetable farming

1. How is vegetable production organized among the youth in the area?
2. What are the main strategies used by youths in vegetable farming?
3. Which ones are considered more paying than others and why?
4. What determines the choice of strategies employed by the youth vegetable farmers?
5. What opportunities and constraints are attached to engaging in high paying strategies?

Perceptions toward vegetable farming

1. How is vegetable farming perceived among the youth?
2. What are the factors that determine youths' negative/positive perception in the area?
3. Are there any linkages between livelihood outcomes achieved among the youth and perceptions towards the sector?

Livelihood outcomes achieved among the youth

1. What factors/issues/behavior denote improvement in livelihood among the youth?
2. Qualities considered low improvement in not well.
3. Whether majority of the youth have the mentioned qualities of improved livelihood.
4. What are the factors that promote improved livelihoods among the youth vegetable farmers in the area?
5. To what extent vegetable farming contributes to improved livelihood among the youth vegetable farmers?

Appendix 3: Checklist of items used for key informant interview

1. What are your key roles and responsibilities with regard to vegetable farming among the youth?
2. Do you encounter any challenges to effectively perform your responsibilities?
3. How is vegetable farming as a livelihood strategy for the youth perceived in the area?
4. Are there any interventions to make vegetable more profitable for the youth?
5. Are there any strategies to engage more youth in vegetable farming in the area?
6. What do you think could be the opportunities and challenges of youth in vegetable farming?
7. Are there any efforts to overcome the challenges and take advantage of the opportunities?
8. Do you think vegetable farming is a sustainable livelihood activity for the youth?
9. Do the youth seek agricultural extension services?
10. Are there any difficulties in accessing these services?

Appendix 4: Operational definition of variable used in Ordinal Regression Model

Variables	Operation definition	Level of measurement
Dependent variable		
Livelihood outcomes level	Whether youth attained low, medium or high level of livelihood	Ordinal Classified in terms of ordered livelihood levels (low, medium and high level of livelihood)
Independent variables		
Age	Age of the respondent	Continuous Measured in years
Education (years of schooling)	Level of education of respondents	Categorical No formal=0 Primary = 1 Secondary=2
Marital status of women	If the respondent is married, cohabitate, single, widowed or divorced. The responses were then coded into dummy variable (Married or otherwise)	Categorical Married =1 Otherwise =0
Experience in vegetable farming	Years since youth started vegetable production	categorical More than ten years = 1, 1-10 years = 0
Access of credits	Received loan for vegetable farming	Nominal Yes = 1, No = 0
Land ownership status	Whether vegetable land belonged to the respondent or rented	Categorical Own = 1, Rented = 0
Type of vegetable produced	Whether the respondents produced more improved or more local varieties	Categorical More improved = 1, More local = 0
Land size	Total land size (Ha) involved in vegetable farming	Categorical More than 1 = 1, Less than 1 = 0