

**AN ASSESSMENT OF EFFECTS OF MANGO VALUE ADDITION ACTIVITIES ON  
WOMEN ECONOMIC EMPOWERMENT IN TANA DELTA SUB-COUNTY, KENYA.**

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**A56/80600/2015**

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN  
AGRICULTURAL RESOURCE MANAGEMENT OF THE UNIVERSITY OF  
NAIROBI.**

**2023**

## DECLARATION

This thesis is my original work and has not been submitted for the award of a degree in any other University

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## **DEDICATION**

This thesis is dedicated to my family.

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## **ABBREVIATIONS AND ACRONYMS**

<b>FAO</b>	Food and Agriculture organization
<b>GDP</b>	Gross domestic product
<b>HCDA</b>	Horticultural crops development Authority
<b>KACCAL</b>	Kenya Adaptation to Climate change in Arid and Semi-Arid Areas of Kenya
<b>KAPAP</b>	Kenya Agricultural Productivity and Agribusiness Project
<b>KGS</b>	Kilograms
<b>LAPSSET</b>	Lamu Port and Southern Sudan Ethiopia Transport Project
<b>MOA</b>	Ministry of Agriculture
<b>WB</b>	World Bank

## ABSTRACT

This study examined the effect of mango value addition activities on women's economic empowerment in Tana Delta Sub-County. It was founded on the need to re-evaluate the effectiveness of local and international organizations that attempt to provide solutions to communities, but fail to follow up on whether the expected goals have been met. This study was anchored on two projects in Tana Delta Sub County: Kenya Adaptation to Climate Change in Arid and Semi-Arid Areas (KACCAL) (2015-2016) and Kenya Agricultural Productivity and Agribusiness (KAPAP) (2010-2015). The study focused on mango value addition activities performed by women in the mango production chain, such as sorting, grading, packaging, and processing. The objectives of the study were: to assess the effect of mango value addition activities on women economic empowerment and to assess to what level women are empowered depending on the activity they are involved in. A descriptive research design was used in the study. The target population included all farmers involved in KACCAL projects, as well as Agricultural Officers and Chiefs in the sub-county, from which a sample of 210 farmers, 14 agricultural officers, and 14 chiefs were drawn, using simple random sampling and purposive sampling techniques. The questionnaire, interview schedule, and document analysis were used to collect both quantitative and qualitative data. The collected data was analyzed using SPSS and content analysis procedures, and the results were presented in percentages, frequencies, tables, and narratives. The results indicated that, 38.1 percent of the respondents were involved in sorting, 28.6 percent in grading, 19 percent in packaging, and 14.3 percent in processing activities. From the results, it was found out that packaging as a value addition activity contributed the most to the economic empowerment of women since it had a coefficient of 0.076

followed by processing with a beta coefficient of 0.073 then sorting with a coefficient of 0.07 and lastly grading with a coefficient of 0.069.

This demonstrates that women actively participated in mango value addition activities as a of earning an income and a way of meeting their economic needs. This study's findings contribute to governments' efforts to find more innovative ways of creating targeted interventions for effective involvement of women in the agricultural sector to economically empower them. Policymakers, development practitioners, and other actors may also consider these cases when planning national women's development activities.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1. Background of the Study**

Women economic empowerment is defined as their ability of women to participate equally in productive activities, gain access to decent work, and participate fully in economic decision-making at all levels. In a study on empowerment, Kabeer (2009) defines women empowerment as the procedure through which women are equipped and allowed to expand their ability to make life-determining decisions and to participate equally with men in bringing about desired changes in the society. According to World Bank (WB) (2018), over 2.7 billion women worldwide are denied the same job opportunities as men. The WB further adds that in 18 of the 189 economies assessed, husbands have legal rights to prevent their wives from working. According to the International Monetary Fund (IMF), increasing female employment rates in developing countries could boost their GDP (WB, 2018). Currently, women outnumber men in informal employment in developing countries. Women undertake 66% of work in the world and they produce 50 percent of world's food, but unfortunately women only earn a meagre 10 percent of the income and own only 1 percent of the intended property (UNRISD, 2016). However, women face numerous challenges, including gender inequality in the workplace, inaccessibility to social protection, poverty, violence and harassment, illiteracy, and a lack of entrepreneurial skills. The majority of women are unable to achieve the highest levels of leadership. For instance, there were only 5% of women in a Fortune study of 500 CEOs (Cheryl, 2014). During the annual meeting of the Clinton Global Initiative in September 2009, former US President Bill Clinton stated that empowering women economically increases their access to economic opportunities and resources. The major question lies on whether the problem is enhancing education and

economic development in the thirdworld countries, fighting global climatic change, or addressing other challenges that humans face. Empowering women being a critical part of the the world's development equation (Clinton, 2009). When properly considered, gender equality yields the highest income of any development investment. Women are more likely, than men, to invest a large portion of their net income to their families and communities. According to a study conducted in Brazil, the chances of a child's survival increased by 20% when the mother was the onemanaging the household income (Clinton, 2009).

According to the United Kingdom Department for International Development (2010), an increase in the position of women in the economy is a major step to adress financial and economic crises in communities. Women empowerment is pertinent for economic sustainability and growth. The GDP of India could increase by 8% if the female to male worker ratio increases by 10%. A higher percentage in female net income and bargaining ability would result in significant investment in children's education, health, and nutrition, and ultimately lead to a long-term economic growth. Women-owned businesses account for only 38% of all registered small enterprise businesses worldwide. These women-owned businesses are rapidly expanding in Latin America, Africa, Eastern Europe andAsia. This ultimately has a direct impact on job and wealth creation.

Though men and women have clearly defined roles and responsibilities in most African societies, the norm has long been that men deserved to make the majority of household decisions (Mburu et al., 2015). As a result, most women have less ownership and control over resources, less access to decision-making forums, and fewer educational and economic opportunities than men (Malhortra and Schuler, 2005).

Agriculture employs one-third of all women worldwide, making it the most essential source of income for women in third world countries (UN, 2017). Over 60% of working women in Sub-Saharan Africa are working in agriculture, particularly on plantations and other agri-food chains.

According to 'The World Development Report (2008) developing countries have enormous agricultural potential). Agriculture is an important part of the national development agenda because it is a tool for reducing poverty and sustaining livelihoods, particularly among the rural poor. Agriculture is the backbone of the Kenyan economy, laying the groundwork for the development of other sectors. Agriculture contributed 28% of the GDP directly in 2014, with crop production accounting for 19.7 percent and animal and fish farming accounting for 4.9 percent and 0.8 percent, respectively (MOALF, 2015). Agriculture also contributes an additional 27 percent of GDP indirectly through links to agro-based and other industries, and it employs 80 percent of the workforce (HCD, 2015). Agriculture grew at a 3.5 percent annual rate in 2014 (MOALF), and the government expects the sector to grow at a 7 percent annual rate in Vision 2030, contributing an additional 80 to 90 billion Ksh to the gross domestic product.

Horticulture sub-sector is an important component of Kenyan agriculture, which has experienced remarkable export-driven growth in recent years, accounting for 33 percent of Gross Domestic Products and 38% of export earnings (GOK, 2010; HCD, 2015). Horticulture employs at least six million Kenyans directly or indirectly each year (MOALF, 2015). In 2014, the total domestic value in the horticulture sector was 201.2 billion, with a production area of 684912 ha, an increase of 8% and 15% in value and area, respectively (HCD, 2015).

Kenya's main horticultural crops include French beans, Asian vegetables, snow peas, mangoes, passion fruits, avocados, pawpaw and cut flowers,. These provide raw materials for the fruit and



vegetable agro-processing industries (HCDA, 2013). Sustained horticultural production is thus required for the achievement of the Kenya Vision 2030 goals and targets (GOK, 2012).

Fruits contributed a total of Kshs 60.84 billion in 2013, accounting for approximately 30% of the domestic value of horticultural produce (HCD,2015), where the area under fruits was 280192 ha, producing 43.3 million MT of fruits) (HCD, 2015). Small-scale farmers account for 80 percent of fruit farming and contribute more than 60 percent of exports. Bananas account for 37.6 percent of all fruits produced for local consumption and exportation, followed by mangoes (19.6 percent), pineapples (12.1 percent), avocados (9.8 percent), pawpaws (5.4 percent), oranges (4.6 percent), watermelons (4.2 percent), and passion fruits (3.7 percent) (KIN, 2016).

In terms of value from tropical fruits, the mango fruit (*Mangifera indica*) was the second most important crop after bananas (MOA, 2011; Kehlenbeck et al., 2012). According to Evans and Ballen (2012), it is one of the most important fruits in the world because of its nutritional value and wide range of products made from it, both locally and globally. In 2013, the mango fruit contributed 15.3 percent of the total value of Kenyan fruits and 5.6 percent of the total domestic horticulture value (HCD, 2013). Mango is significant because it can be produced in a variety of climates, ranging from sub-humid to semi-arid, and because of the availability of local and export markets for a wide range of its finished products (Griesbach, 2013). Though it is a commercial crop, it is a staple in most Kenyan households, regardless of economic status, and is high in vitamins A, B6, C, and E (Kandiu, 2012).

Mango production in Kenya is dominated by small-scale farmers, who account for roughly 80% of the total production (MOA, 2011; Njuguna et al., 2013). Makeni 20.2 percent, Kwale 14.6 percent, Kilifi 12.3 percent, Migori 9.9 percent, Machakos 9.3 percent, Embu 8.2 percent, Meru 5.7 percent, and Murang 1.4 percent are the leading counties in mango production in terms of

value (MOAL, 2015). Farmers have not benefited much from the fruit due to several challenges that include lack of adequate knowledge on orchard management, high post-harvest losses of about 40%, and lack of access to prime markets.

Tana River County's main cash crop is the Ngowe variety of mangoes, which is commonly grown along the Tana River. The easy availability of a surplus of fresh mango fruits has prompted several individuals, common working groups, and cooperative society organizations in the county to engage in mango agro-processing. This study builds on KACCAL projects that were implemented in Tana Delta Sub County from 2010 to 2015 and 2015 to 2016, to increase agricultural productivity and income for small-scale farmers involved in agricultural and agribusiness activities. The two were World Bank-funded projects that aimed to contribute to a long-term increase in Kenya's agricultural productivity while improving the livelihoods of those living in rural communities by improving demand-driven agricultural technology supply, as well as the adoption and application of modern methods (KAPAP, 2014). The projects in Tana River County focused on four value chains: goat meat, camel milk, agriculture, and mango marketing and agribusiness activities.

Based on the foregoing, it is clear that the mango industry contributes significantly to the Kenyan economy through the agriculture sector, a sector dominated by women. As a result, empowering women through mango value addition activities would allow them to fully participate in the planning, execution, and implementation of agro-processing activities in rural development. As a result, empowerment leads to development, which leads to even more empowerment. However, there is a scarcity of data on the effects of mango value addition activities on women's economic empowerment in Tana Delta Sub County, a Sub County marked by persistent economic and

social backwardness. This necessitates research in this area and specific fields, thus the need for a study.

## **1.2. Statement of the Problem**

Fruits are Kenya's second most important horticultural crop (FAO, 2009). Fruits account for 29.6 percent of total horticultural produce, trailing only vegetables (44.6 percent), with flowers accounting for up to 20.3 percent (MAO, 2012). Small-scale farmers are primarily responsible for the production of fruits and vegetables. Mango fruit is a source of raw materials for agro-processing industries; it contributes to food security, job creation, income generation, and, ultimately, poverty reduction (MOA, 2010). Approximately 98 percent of Kenyan mangoes are consumed locally, with only 2 percent exported (GOK, 2012). LAPSSET (a Kenyan government project launched to investigate the opportunities and potentials of the mango industry, indicated that Kenyans consume approximately 51 percent of mangoes produced annually (GOK 2012). Due to poor post-harvest handling, approximately 40% of the total amount of mangoes produced goes to waste, especially during the peak season KARI (2004). According to Gor et al. (2012), approximately 20-25 percent of all mangoes produced in the world are wasted due to poor variety selection, poor quality, poor post-harvest handling techniques, insufficient infrastructure, mechanical damage on the produce, and an abundance of fruits available in the market. Mango value addition activities (sorting, grading packaging and processing) can help to address some of these issues. The procedure of transforming a good or produce from its commonly used original or natural state to a more economically valuable state is known as value addition. A broad definition is to increase the economic value of a product by transforming it from its current state

to a set of market-preferred characteristics (Akridge et al., 1997). Field sorting, grading, packaging, and processing are also included.

Mango farming is an economic mainstay in Tana River County, according to GOK, (2020), with Tana Delta Sub County producing about 30-50 MT annually, of which only 15-20% is marketed for processing. The remainder is sold and consumed as fresh fruits both within and outside the county (Agriculture Report Tana Delta, 2016).

Tana Delta's female population accounts for more than half of the sub county's total population (GOK national census, 2010). Tana Delta women do the majority of the mango production work, but they only receive a small portion of the income generated. Though men and women in this region have different roles and responsibilities, the norm has long been that men deserved to make the majority of household decisions (Mburu et al., 2015). Women are given fewer ownership opportunities and have insignificant control over resources; their participation in decision-making is severely limited due to fewer educational and economic opportunities, despite their involvement in mango field sorting, grading, packaging, and processing (Malhortra and Schuler, 2005). Yet, scholars have not sufficiently investigated the significance of these value-added activities for women's economic empowerment in Tana River County. As a result, it is necessary to assess the effects of value-added activities on women's economic empowerment in the area. The findings of this study will contribute to women's empowerment not only in Tana Delta, but also in other contexts locally and globally, and will be a critical step toward women's ultimate economic emancipation.

### **1.3. Objectives**

#### **1.3.1. General Objective**

The main aim of the study was to assess the effect of mango value addition activities on women's economic empowerment in Tana Delta Sub County.

#### **1.3.2. Specific Objectives**

- i. To examine the effect of mango value addition activities on women's economic empowerment.
- ii. To evaluate the influence of the different types of mango value addition activities on the level of women's economic empowerment.

### **1.4. Research Hypotheses**

- i. Mango value addition activities have a positive effect on the economic empowerment of in Tana Delta Sub County?
- ii. The level of women economic empowerment is not affected by the type of mango value addition activities they engaged in.

### **1.5. Justification**

The majority of local and international organizations are keen on giving solutions to communities without coming back to assess whether the anticipated solutions have been achieved or not. This is in reference to the two projects: Kenya Adaptation to Climate Change in Arid and semi-arid areas of Kenya project (2015-2016), and Kenya Agricultural Productivity and Agribusiness Project (2010-2015) in Tana Delta Sub County. This study is of importance to institutions and organizations that implement their projects in different contexts, as it will be an

eye-opener on the extent to which such projects impact the beneficiaries, especially women, on several factors which include access and management of resources, decision making together with revenue generation (income). Apart from this, the findings from this study provide information that addresses issues related to whether mango value addition activities, especially juice making and solar dried mango crisps ventures, can empower women economically.

### **1.6. Scope and Limitations**

This research focused on the effect of mango value addition activities on women economic empowerment in Tana Delta Sub County, Tana River County. Interest was in the opinion of those farmers who have previously been involved in the KACCAL and KAPAP projects in this sub-county. The sub-county was selected since it produced more beneficiaries of the KACCAL project in the county. Of utmost importance were the responses regarding women economic empowerment, all others were back-grounded.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

Other authors' related literature is reviewed in this chapter. The main and specific objectives guided the selection of documents to be reviewed. The reviewed scholarly works are divided into two categories: the effects of mango value addition activities and women's economic empowerment. To set the scene, a brief description of mango production and related activities is provided. This section is divided into specific research questions: what is the effect of mango value addition activities, and to what extent do mango value addition activities empower women?

#### **2.2 Mango Production**

Mango (*mangifera indica*) is a tropical and subtropical fruit tree native to India that has been cultivated for nearly 4000 years (FAOSTAT, 2007; Mulinge, 2015). Nigeria is the largest mango producer in Africa, producing approximately 730,000 MT of mangoes per year, followed by Kenya, the leading mango producer in East Africa (FAOSTAT, 2007). Kenya's agro-ecological conditions are well suited to mango production, with latitudes ranging from the sea level to over 5000 meters in the highlands, and annual rainfall ranging from 250mm in semi-arid and arid areas to 2000mm in high potential areas, making most of the country suitable for mango production. Mangoes thrive at altitudes of up to 1500m above sea level, with temperatures ranging from 15 to 30 degrees and annual rainfall ranging from 850 to 1000mm. Mangoes are primarily grown in the country's lower eastern and coastal regions.

Mango production in Kenya began in the 14th century after being introduced by ivory traders and slaves, and it is now a major source of income for many small-scale farmers in arid and

semi-arid regions. Over 60,000 rural households are supported by mango production (FSD Kenya, 2015). Local and improved varieties are grown along the coast and in the eastern regions (FAO 2005), though local varieties are grown in western Kenya for domestic consumption. Local varieties include Ngowe, Dodo, Boribo, and Batawi, with Ngowe and Dodo being the most common, and exotic varieties include Apple, Kent, Tommy, Atkins, Van, and Dyke, among others FAO (2005), with Apple being the most common. According to FSD Kenya (2015), mango production increased rapidly in the last decade, rising from 254,113 tonnes in 2005 to 754,102 tonnes in 2012. This increase was accompanied by an increase in demand for mangoes in domestic, regional, and export markets. Despite this expansion, there is a scarcity of documentation on women's economic empowerment.

According to Lalel et al. (2003), the final quality of mango fruit is determined by harvest maturity and post-harvest management. Mangoes are harvested when their color begins to change from green to orange or yellow. The perishable fruit must be handled with care after harvesting to avoid staining and losing both shape and color. Mangoes are harvested and packed in wooden or plastic containers to prevent physical damage. They are then transported to packaging facilities, where they are sorted, graded, washed, and packed into single shallow trays weighing 4-5kg, ready for market (Griesbach, 2003).

According to MOA data (2007), only a small percentage of mangoes produced are processed. Processing is carried out in large firms based in Mombasa and Nairobi Mulinge, (2015), as well as, more recently, Makueni. Value addition activities peak during processing preparation, with women being the most involved, thus the focus of this research.

The mango markets can be found in fresh fruit, processed fruit for immediate consumption in the form of juices, dried and pickled mangoes, and fruit used in food preparation in the form of



chutneys, pastes, purees, and mango slices sold in small and large volumes. Mango processing in Kenya has increased over the years in response to increased demand, particularly for fresh mango juice and processing industries such as Delmonte and Milly Mint. Mango is the main cash crop in Tana River County, and men make the majority of production decisions, including planting and marketing. The majority of orchards have tall and mature trees. Only 2% of mango is irrigated, while the rest is grown along the Tana River's banks, with punda and Dodi being the most popular local varieties. As well as farmers frequently add manure to mango trees due to a lack of funds to acquire inorganic fertilizers. Male-headed households have the highest productivity because the land tenure system favors them, as men are more likely than women and youth to have a relatively secure tenure system that allows for the production of perennial crops (MOALF 2016). Youth-owned farms have low productivity, which can be related to the ownership of younger mango trees that are yet to produce yields.

The mango value chain is primarily made up of farmers who produce, sell, and add value, as well as brokers who act as buyers. Mangoes can be sold by individuals or by cooperatives. Farmers add value primarily by transporting (an activity dominated by youth) and packing at collection centers. .

Processing is very low as a result of the collapse of the mango-processing plant that were initially located in Boji and is now being improved by the county government. The farmer-owned processing unit in Garsen is not able to handle the volume of mangoes produced in the county. Farmers have drastically reduced their sales to brokers as a result, owing to their lack of bargaining power.

### **2.3 Mango Value Addition Activities**

Mango value addition activities are those that improve and increase farmers' income from mango products (Musyoka, Isaboke and Ndirangu, 2020). They are activities that allow farmers to lower post-harvest losses and maximize their mango production returns. According to Oyewole and Eforuoku (2019), value addition entails converting a product from its original or natural form to a more valuable form through value creation and innovation. Sorting, grading, packaging, and processing were the value addition activities studied in this study. ,

Small scale farmers were interviewed in Musyoka, Isaboke, and Ndirangu's (2020) study in Machakos county, and their findings indicated that many of farmers in the area under study enhanced the value of mangoes by adding them to natural juices, slicing, making mango powder, mango wine, and other products. However, these activities were short-lived because farmers lacked preservation technologies, causing their products to go to waste. Furthermore, their research found that farmers were aware of sorting, grading, and cold storing as activities aimed at increasing the value of the mango crop. Their study differs from the current one in that it did not investigate the importance of these activities in women's economic empowerment. Their focus was Machakos, whereas the current study was based in Tana Delta hence contextual differences.

Mkandawire, Bett, and Gathungu (2018) investigated the effect of value addition activities on farmer income and discovered that sorting, storage, grading, and packaging were the most valuable practices among Machakos farmer groups. Their research is relevant to the current one because it demonstrates the importance of these activities in adding value to mango produce. The current study, on the other hand, goes a step further to investigate the impact of these activities on women's economic empowerment.

Mango value addition activities that reduce post-harvest losses, according to FarmBiz Africa (2020), contribute to farmers' income enhancement to a greater extent than pre-harvest activities. In a study conducted in Kitui, farmers who produced mango powder, flour, and flakes saw a 20% increase in profits when compared to those who did not. The findings revealed that farmers' socioeconomic status in the region improved as a result of post-harvest value addition activities. Furthermore, farmers who were trained in post-harvest mango handling to avoid losses had a higher chance of experiencing increased output than those who were not. Their research contributes to the current one by demonstrating the importance of value-added activities to mango farmers. However, it is not focused on women's empowerment, which is the goal.

### **2.3. Effects of Mango Value Addition Activities**

Mango value chain development involves activities that flow from production, harvesting, sorting, grading, aggregation, packaging, and processing and consumption (FSD Kenya, 2015). The study focused on sorting, grading, packaging, and processing because these are the most popular among women at the production level, there are different types of farmers: small-scale farmers with less than 50 trees, and who sell their produce to rural traders. These are the least commercial. Medium-scale farmers with between 50 and 300 trees. These are semi-commercial while the large scale and very large scale farmers with more than 300 trees, who are the most commercial, sell their produce to supermarkets, industries, and export markets.

At the harvesting stage, farmers pick up to approximately 78 fruits per tree while large-scale farmers harvest up to 189 fruits per tree. At times farmers sell their fruit at harvesting through a process called 'on the tree' sale. This fetches the least amount of income because they have less control over the quality of the fruit. Most packing and packaging take place at organized pack-houses. Packing is mostly done for export and not for domestic consumption. Processing takes

place in two different ways: local processing on one hand where individuals are tasked with the preparation of the fruit in readiness for consumption including making of fresh juice using hand blenders at the local fruit shop, chopping the fruit into small crisps drying, and preserving them and industrial processing on the other hand. This study focused on what we call local processing because this is where most women are involved more than in industries.

Mangoes are important horticultural fruits for domestic and export markets, and constitute a considerable potential for foreign exchange and employment (Mulinge, 2015). In Kenya, mango fruits are consumed locally contributing to food security, particularly in the rural areas where mangoes serve as supplementary food when food reserves have dwindled. In urban areas, mangoes are consumed as fruits, juices chutney, jam, canned and dried fruit. According to Food and Agriculture Organisation FAO (2005), mango production in Kenya is majorly carried out in the coastal, central, and eastern regions. There is both scale small- and large-scale mango production for local and international consumption. Significant mango quantities are processed into juices and fruit concentrates to add value. However, there is a decline in income from mango production due to unreliable market prices, lack of creativity among farmers, and crop mismanagement. Other challenges facing mango production in the country include seasonal over-production inadequate post-harvesting techniques and facilities which cause massive losses. Lack of access to information on value addition and preservation techniques poses a threat to the profit maximization from mango production.

Mulinge (2015) examines factors that influence grafted mango production in Kitui county, in Matinyani division that revealed the level of value addition of mangoes in the division was low, resulting in high mango losses which caused to low-income generation for farmers. It was also revealed that there were inadequate market linkages outside the county. Value addition,

marketing, and processing technologies, therefore, need to be adopted in the county to improve mango shelf-life and enhance income for farmers. Mulinge's study is important to the current study since it acknowledges the importance of mango production to farmers and ultimately the economy of Kitui county and Kenya in general. However, it focused on mango production in general while the current study was specific on mango value addition activities such as sorting, packing, and their effect on women economic empowerment.

Kemboi (2015) examines factors influencing the adoption of value adding technologies among mango fruit farmers in Machakos County that revealed that the major reason why farmers are reluctant to use post-harvest technological procedures and processes is because of the high cost of acquiring the technology. It also found out that most farmers, though motivated to use the technology, lacked the awareness of how to use it. It was recommended that farmers need to be trained on the use available loan facilities to maximize profits.

FSD Kenya's (2015) study focuses on the opportunities available for financing the mango value chain in lower Eastern Kenya. The study was based in Makueni, Kitui, and Machakos counties. The study explored a survey design on a sample of 620 value chain actors. The findings revealed that there was an increase in mango production at the rate of 12% per annum with 47 % of the produced mangoes being consumed locally while 2% and 8% were exported and processed respectively. It was noted that there was a 25% loss rate and concluded that there was a need to export more mangoes to increase the income for farmers. It was suggested that diverse value addition activities be implemented to curb the losses ease pressure in the local market. These value addition activities constitute a source of income for small-scale farmers most of whom are women, thus the need for the current study. Income from mango production peaks between October and April with December being the highest in returns. Most of this contributes to

household expenses while the rest is reused in mango production expenses such as pruning, weeding, pest control, and harvesting.

Interestingly the study observed that 85% of farmers financed their mango-related operations from savings, friends, and relatives, only 4% of farmers (categorized as large scale farmers) financed their activities from formal sources. Small scale farmers had no access to finance from financial institutions occasioned by their inability to finance monthly instalments. The study concluded that banks need to extend credit facilities to farmers and other actors along the mango value chain. However, FSD Kenya's study did not focus on the effects of mango production on economic empowerment, particularly on women. This study will fill this gap.

## **2.4 Women's Economic Empowerment**

Kulkarni (2016) observes that throughout centuries women have been subordinated to men with their responsibilities being tied to homemaking, biological reproduction, and nurturing. This is common in patriarchal societies where economic power is a reserve of men. However, since 1974 there have been efforts to change the status of women and enable them to achieve economic freedom. International organizations set forth plans and actions that focus on women's economic empowerment, the years 1976-1985 were described as the decade from women, with the UN campaigning for women rights. All countries under the UN were called upon to take steps towards equating women and men economically, socially, and politically. This has not however been realized two decades later, hence the need for this study. Furthermore, participation in the labor market has proven to be difficult for women in developing countries; wages paid to women are lower than those of men in the same rank. In Kenya, a total of 75% of citizens who are mainly women are employed in the Agricultural sector (The World Fact Book, 2015).

Ellis et al (2007) examine gender and economic growth in Kenya to find the obstacles that prevent women in Kenya from contributing fully to the economy, the study was also aimed at examining gender-related barriers and bureaucracies that prevent women from achieving their potential economically. The researchers acknowledged that Kenyan women have unequal access to opportunities and assets, a factor that contributes to poverty among them. The study suggests that eliminating gender-based inequalities could result in GDP growth; it also suggests that since women are poorer than men, reducing poverty levels among women by at least 5% would lead to the country's economic growth to some extent. One key recommendation from their study, and which is important to the current study, is that there is a need to increase agricultural productivity and output on crops where women are more involved by providing opportunities for women to own land and property; with land ownership, women will increase productivity and ultimately economic value. However, their study did not focus on mango production as a sector in the economic development of women and the Kenyan economy in general, this study will fill this gap.

DAC Network (2011) examines empowering women economically as a prerequisite for any form of sustainable development, and observe that in order to achieve women economic empowerment one cannot do a quick fix, but must endeavor to develop 'sound public policies, that holistically bring out long term commitment from all development actors' (p3). They observe that there is a need for women to get access to assets and services such as land, water, innovation, and credit from the banking and financial services which will lead to a strengthening of their rights, an increase in their agricultural productivity a reduction of hunger and ultimately a promotion of their economic growth. Women's economic empowerment raises the rate of access to economic resources and opportunities by women. This includes acquisition of jobs,

skills development, and market information, these will, in turn, increase their productivity. Therefore, any form of increase in the role of women in the economy should be enhanced as part of the solution to the financial and economic crises currently witnessed, this is because ‘women are known to usually invest a bigger proportion of their earnings in their families and pump more into communities development than men’ (World Bank, 2010: 6).

DAC Network further highlights that women as farmers, processors, and traders often supply local, regional and international markets with a variety of goods yet it is always perceived that farmers who need economic empowerment are men. ‘This perception of farmers being viewed as male – in the face of all evidence to the contrary – is a major obstacle to the improvement of agricultural production and productivity’ (p11) by women. As a result, gender inequalities frequently practice result in poor agricultural and human improvement outcomes. A study carried out in four African countries revealed that supplying women farmers with the same quantity and quality of inputs given to men, and improving their access to agricultural education, could increase national agricultural output and incomes by an estimated 10% to 20% (DAC Network, *ibid*). Although the DAC Network dealt with women and the economy, their focus was not on mango production nor mango value addition activities and the influence on the economic empowerment of women, this study will focus on this. The network suggests different approaches to improving women economic empowerment: giving women credit, this contributes to funds for productive investment that ultimately improves and stabilizes the livelihoods of those who depend on these women; provision of additive services like training and modelling would lead to improved women’s skills on utilization and control of resources; Holistically taking an approach to women empowerment through social and political goodwill; tackling



cultural barriers and eradicating discriminatory practices and attitudes that work against women.

Women are known to operate smaller farms compared to men, they rear fewer livestock, typically of poor breeds, and earn much less from the livestock they own, these activities are not formally funded. There is need for private donors to support women's efforts in different sectors including agriculture to enhance their productivity. To a greater extent women are involved in low economic output activities such as fetching of water and firewood while having access to less innovation and productive assets and services, 'they are unable to purchase farm inputs such as fertilizers, improved seeds, and improved mechanical equipment, they have poor representation in the leadership roles of rural organizations, at the regional and national level, those who are employed are most likely on part-time engagement or in seasonal and low-paying jobs, in which they always earn lower wages for a similar kind of work done by men even when their experience and qualifications are higher (DAC Network, 2011:18). It is because of their involvement in income-earning activities such as mango packaging, and processing without receiving an equivalent pay package that there is a need to investigate whether these activities contribute in any way to their economic empowerment.

Gachemi (2018) examines the role played by groups of women in their economic empowerment in Magutu Division, Nyeri County. The study was anchored on the need of the evaluation of government-oriented and NGOs impacts, and policymakers in improving the socio-economic status of Kenyan women. The focus was on the income-generating activities in which women are involved, factors relating to gender and which affect the performance of women groups, challenges that women groups face and mitigation strategies in the enhancement of women

groups. qualitative and quantitative data were collected by a descriptive research design from a sample of 106 subjects who included leaders of various women groups, group members, and the County Gender Officer. The target population was made up of 320 members of 15 women groups that were in existence for over 10 years. The economic empowerment process of these groups had been noticed and weighed in terms of completed projects and revenues raised. The research tools employed in collecting data were both questionnaires and an interview schedule. Percentage frequencies, tables, and narratives were used as data analysis methods. Findings revealed that majority of women groups in Magutu Division have come up with various income-generating activities to enhance their income. Women had also set rules and conventions that governed their operations. This demonstrated a dedication to their groups' activities for the improvement of their economic status. These findings further showed that when women band together in women groups, they can improve their economic status through the economic activities they are engaged in. From the findings, it was recommended that group members be equipped with skills of tackling challenges in their groups and be exposed to mechanisms such as capacity building fora to ensure that they are empowered and sensitized economically to generate regular incomes for themselves as well as their families. This study informs the current study since it acknowledges that women who work in groups achieve economic empowerment, it also acknowledges that women face challenges in their endeavors to be economically independent. It however examines women from Nyeri County in the central region of Kenya, a region whose women have been described as proactive in wealth creation and different from the coastal women who are generally viewed as lazy. The study also focused on women groups while the current research is examining women's involvement in mango value addition activities.

## **2.5 The Kenya Adaptation to Climate Change in Arid and Semi-arid Lands(KACCAL)**

### **Project**

The KACCAL project was run between 2010-2015 to enhance agricultural productivity and income of smallholder rural folks in the target areas. The project was supported by the Kenyan government and the World Bank through the Global Environment Facility (GEF) Grant for US\$ 5.5 million, nationally. The project is linked to the Kenya Agricultural Productivity and Agribusiness Project (**KAPAP**) whose objective is to raise agricultural productivity and increase the income of smallholder farmers within the project's mandate area. It supported capacity building among farmers for mainstreaming climate dynamic considerations into development planning through Sector Wide Approach (**SWAP**) to integrate and adapt climatic changes into day to day rural development programs.

The project was piloted in four counties nationally, namely, Garissa, Kilifi, Tana River, and West Pokot. InTana River County, it supported community capacity building and community-based micro-projects in Tana North (3 sites) and Tana Delta sub-county(8 sites) through mango productivity, value addition activities, and marketing. The majority of the beneficiaries were from Tana Delta Sub County where mango production is higher in the county, this is why the sub-county has been selected as the area of focus for this study.

## **2.5 Theoretical Framework**

### **2.5.1 Social Feminist theory**

This study is anchored on the social feminist theory. Social Feminism is **based on female values**. Its aim is to expand the role of women beyond the private sphere, and to fundamentally transform society. Socialist feminists agree that patriarchy and capitalism are siamese systems of oppression. Due to this therefore, there is need for transformation of relations at family and societal level through a redistribution

of responsibilities, and drastic changes in access to education, healthcare, economic opportunities and political power (Graf, 2012). Social feminism began in the late 1960s out of the need for women and social emancipation. It grew out of the same social ferment and the same consciousness-raising groups that produced other forms of feminism. Socialist feminists have over the years attempted to come up with creative synthesis of debates that challenge the root cause of oppression for women. At the centre of socialist feminism, is the understanding that not just one system of oppression is at the heart of women's subordination but a combination of systems related to race, social class, economic, gender, sexuality, and nationality. From this perspective, dealing with just one of these without also and simultaneously dealing with the others, will not lead to liberation. As a result, socialist feminists address a full range of oppressions, not just the sex/gender related systems.

According to Graf (2012), some of the goals of this theory are:

1. to ensure attractive, comfortable housing designed to allow for private and collective living.
2. to ensure varied, nutritious, adequate diet for all.
3. to ensure social respect at work and for the work done by people through an understanding that all jobs are socially necessary and important to everyone.
4. to ensure a democratic environment through which all people control decisions affecting them directly or indirectly in their day to day lives at work, home, and in the community.
5. to come up with scientific-oriented resources aimed at improving people's way of life.
6. to come up with varied, quality consumer products that meet basic needs
7. to ensure job rotational practices that meet the life needs of those working as well as those receiving the services which would encourage the participation of all people in the political and economic life of a country.

Goals 3 and 6 are key to the current study since they focus on the economic liberation of women. Socialist feminists emphasize the contribution of women to economic, social, and cultural well being of their communities. Women are the people who give birth, socialize children, care for the sick, and provide

the emotional labor that creates a homely environment which forms the retreat for men from the realities of the workplace and the public arena. Social feminists view this as important labor which is overlooked and denigrated. They emphasize that within their workplaces most women face challenges of job market segregation, lower wages for the same work, and sexual harassment. This status quo has been normalised by the the complacency of the labor movements. The main input of the social feminist theory to the current study is the acknowledgement that women economic and cultural oppression can be ended through economic empowerment. This therefore aligns with the study's objectives of examining how mango value addition activities contribute to women economic empowerment and to what level each activity contributes.

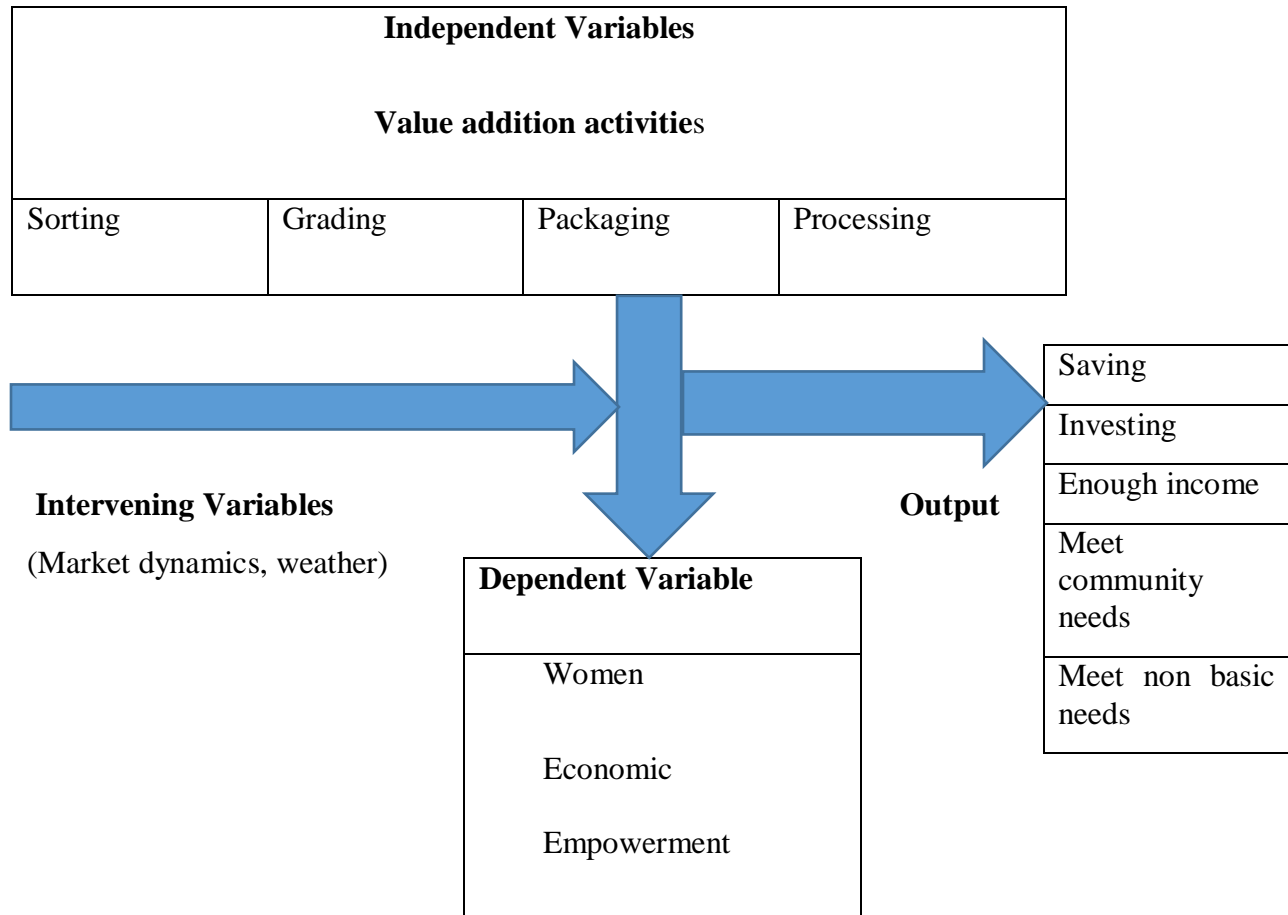
### **2.5.2 Relevance of the Theory to the study**

United Nations (1994) observes that women's empowerment and autonomy, and potential improvement in their political, social, economic and health status is crucial for societal economic development.

The Social Feminist theory acknowledges the crucial role of women in the society yet they are under oppression. It also recognises that empowerment of women is a key step for sustainable development. Owing to the fact that women are discriminated in many societies and contexts in the world, this theory emphasizes that greater equality for girls and women in health and nutrition care is the first step in ensuring that women realize their full potential and become equal partners in all aspects of development. This is aligned to the United Nations (1994) human dignity underpinnings. This study tries to find out whether mango value addition activities do empower women economically, and if so to what extent mango sorting, grading, packaging and processing impacts on women economic empowerment.

## 2.6 Conceptual Framework

A conceptual framework refers to a graphical diagrammatic representation of the relationship between the variables in a study (Mugenda and Mugenda, 2003). The conceptual framework for this study is built on the effects of mango value addition activities as the independent variables while women empowerment is the dependent variable. Such activities as sorting, grading, packaging, and processing influence, in a certain way, the economic well-being of women in the Tana Delta sub-county. See the relationship between the variables in the figure below.



**Figure 2.1: Conceptual Framework**

**Source: The Researcher**

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.0 Introduction**

This chapter presents an overall plan and the methodological procedures that were adopted for this research. It describes the research design, population, sample and sampling techniques, research tools, data collection, and analysis procedures, and the ethical issues that guided the study.

#### **3.1. Research Design**

A descriptive survey design was adopted for the study. This design entails the collection of information through interviewing or administration of questionnaires to a given sample of individuals to describe specific characteristics of the entire group, which is represented by the sample. It is effective in examining an aspect from different perspectives and multiple subgroups (Spector 2019). In addition, the researcher gets an opportunity to identify patterns, incidences, and the prevalence of an outcome in the target population at the time of the study (Bryman, 2016).

#### **3.2. Study Location**

The study took place in Tana River County, Tana Delta Sub County. Tana Delta Sub County covers an area of 16013km<sup>2</sup> and is made up of six wards: Garsen West, Garsen Central, Garsen North, Garsen South, Kipini West, and Kipini East. River Tana traverses in the Sub County for 270 km to the Indian Ocean. Over 90% of the Sub County is an arid and semi-arid land with bimodal rainfall of between 800mm – 1000mm p.a. in the south, and 300 – 400mm p.a. in the

hinterland west. The Sub County has 17 locations and 39 sub-locations which make up the Garsen constituency.

The Sub County lies within the Coastal Lowland [CL] 1 – 6. The soils here are predominantly sandy loams with alluvial deposits on either side of River Tana. Such soils are a major contributor to agricultural potentiality of the area. Tana Delta Sub County was selected because it is the leading subcounty in mango production in Tana River County and it constituted 8 sites out of the 11 that were used in the KACCAL projects 2015-2016.

### **3.3 Target Population**

The target population constituted mango producers, mango processors, Agricultural Officers and area Chiefs within the location of study. This research made use of two main groups of respondents: mango producers and mango processors. However, there were two additional groups (agricultural officers and area chiefs) of respondents to supplement them. Respondents were predominantly women who have been involved in the KACCAL project previously. The Kenya National Bureau of statistics records, at the time of the study, revealed that there were approximately 110,640 persons (55,716 males and 54,924 females) in Tana Delta Sub County (Kenya Population and Housing Census, 2019) who dwelt in 26,886 households of Pokomo, Orma and Wardei communities (Oludheet et al., 2013). More women than men were involved since they constituted a higher percentage of those involved in mango value addition activities and the research was about their economic empowerment. However, men's opinion was also sought regarding mango value addition activities and women's economic empowerment. Data from mango producers and processors majorly focused on the effects of value addition activities



on women economic empowerment and that from agricultural officers and area chiefs was used to assess the level of women's economic empowerment through these activities.

### 3.4 Sampling Procedure and Sample Size

#### 3.4.1. Sample Size

The sample size for the study constituted 238 respondents (140 women and 70 men, 14 agricultural officers and 14 area chiefs drawn from 14 locations (10 women and 5 men were selected from each location) with exception of Asa, Kone, and Galma locations where mango farming is not an economic activity.

Sample size(n) was calculated by;

$$n = \frac{Z^2 \times P \times (1-P)/e^2}{[ Z^2 \times P \times (1-P)/e^2 N ]}$$

Where N =population size

Z =Critical value of the normal distribution at the required confidence level,

P = standard of deviation

e = margin of error

$$n = \frac{1.96^2 \times 0.5 \times (1-0.5) / 0.05^2}{[ 1.96^2 \times 0.5 \times (1-0.5) / 0.05^2 \times 2380 ]}$$

$$n = \underline{384.16}$$

$$1.614$$

$$n = \underline{238.01}$$

### **3.4.2 Sampling Technique**

Simple random sampling together with purposive sampling procedures were employed to identify the participants for the study. Simple random sampling was selected because it gives each member of the target population an equal opportunity to be part of the sample. Purposive sampling on the other hand was adequate to select those respondents deemed to possess the kind of information which would be relevant to the study. There were two categories of main respondents: mango producers and small-scale mango processors, and two categories of supplementary respondents: agricultural officers and area chiefs. Respondents were selected in the following manner:

In the first stage, the study area was divided into 14 zones (locations). These zones are: Shirikisho, Ngao, Oda, Wachu, Chara, Konemasa, Galili, Kipao, Mwina, Salama, Ndera, BilisaKipini, Ozi and Kilelengwani

Random sampling and Purposive sampling procedures were employed to select women and men from these locations who had been involved in the KACCAL projects previously and who were to provide data for analysis. Purposive sampling was also used to identify two agricultural officers and two area chiefs from whom supplementary data were collected. The locations constituted the strata from which the respondents were derived, through purposive sampling.

**Table 3.1: Distribution of Respondents from each Zone**

<b>S/NO</b>	<b>Zones/ Location</b>	<b>No of Women</b>	<b>No of Men</b>	<b>No of Agricultural officers</b>	<b>No of Area Chiefs</b>
1	Shirikisho	10	5	1	1
2	Ngao	10	5	1	1
3	Oda Wachu	10	5	1	1
4	Chara	10	5	1	1
5	Konemasa	10	5	1	1
6	Galili	10	5	1	1
7	Kipao	10	5	1	1
8	Mwina	10	5	1	1
9	Salama	10	5	1	1
10	Ndera	10	5	1	1
11	Bilisa	10	5	1	1
12	Kipini	10	5	1	1
13	Ozi	10	5	1	1
14	Kilelengwani	10	5	1	1
	<b>Total</b>	<b>140</b>	<b>70</b>	<b>14</b>	<b>14</b>

The next stage of the sampling procedure involved the identification of respondents.

For the main respondents' category, a list of farmers who participated in the KACCAL project on mango value addition activities was obtained from the departments of Agriculture and Livestock in Garsen Tana Delta Sub County in Kenya. From this list, respondents were selected randomly. Random selection ensured that the sample is as representative as possible and that each of those in the list had an equal opportunity of being selected. For agricultural officers and

area chiefs, the research assistants participated in identifying one officer and one chief per location. This was done purposively.

The final stage entailed mapping out each of the selected zones to identify data collection sites. In each location, a specific point was identified where the research assistants were to meet with the respondents and distribute the questionnaires, allowing them time to fill in and collect them back. For agricultural officers and area chiefs, the principal researcher visited them in their offices and conducted interviews (See appendix III and IV, list of interviewed chiefs and agricultural officers and their codes).

### **3.5. Data and Data Collection Tools**

#### **3.5.1. Data Type**

Primary and secondary data were collected and used in this research. Secondary data were elicited from records kept by agricultural officers and other key players along the mango value chain. Primary data were collected from mango producers, mango processors, agricultural officers, and area chiefs. Two categories of data were collected: Quantitative data from questionnaires and document reviews, while qualitative data was collected through interviews.

#### **3.5.2. Data Collection Tools**

Primary data was collected by use of two main tools: questionnaires and interview schedules while secondary data were collected through documents review. These tools are described below.

##### **a) Questionnaires**

A semi-structured questionnaire was developed for this research, to collect data from two categories of main respondents (mango producers and mango processors) (see Appendix I Questionnaire). The questionnaire was selected because it allows for the collection of data from a

large population quickly and efficiently (Mugenda and Mugenda 2003), and is relatively easy to administer compared to other tools (Blaise and Achola, 2004). The questionnaire constituted both closed and open-ended questions. It had two sections: one, constituted questions that were to bring out the demographic characteristics of participants, and section two sought information on the effects of mango value addition activities on women economic empowerment. However, to capture more specific data, the questionnaire included questions covering perceptions and opinions on the level of economic empowerment.

#### **b) Interview Guide**

An interview guide was developed and used to collect data from agricultural officers and area chiefs (see Appendix II for this). The interview guide comprised open-ended questions that sought to collect qualitative information on the effects of mango value addition activities on women economic empowerment. An interview guide is useful in this kind of research since it allows for the collection of in-depth data that can provide useful insights to augment data collected through other tools (Kothari, 2004). It provides room for probing and clarification thus enhancing the quality of the data collected.

#### **c) Documents Review**

Agriculture records were obtained from field officers on the dates and times agreed between the researcher and the officers and reviewed for secondary data.

### **3.4.3 Data Collection Procedures**

#### **Collecting Data using Questionnaires**

For a quick collection of accurate and reliable data, three research assistants were recruited and trained for this study before the commencing of the data collection period. The training focused

on: the research problem, objectives, field procedures, etiquette and effective communication skills, confidentiality, and ethical issues. Research assistants were also taken through the data collection tools to internalize them beforehand.

Once ready, research assistants were disseminated to the field, each assistant was tasked to collect data from five zones, assigned according to convenience and accessibility. They were to administer questionnaires to the respondents and collect them once they had been filled in. In cases where respondents were not ready to fill and hand in the tools immediately the assistants were to wait and collect them later. Quantitative data was collected using this tool.

### **Collecting Data using Interviews**

All interviews were conducted by the principal researcher. The date, time, and venue of each interview session were decided upon by the researcher in consultation with the interviewees. Consent for recording was sought beforehand and interviewees were made aware that the sessions would be recorded using an audio recorder and asked for their consent. All of them agreed. Each interview session lasted between approximately forty-five and sixty minutes with the variation being brought about by individual differences among the interviewees and other dynamics. The researcher employed interviewing skills such as rephrasing, paraphrasing, polite challenging, reflection, and probing to seek clarifications and avoid ambiguous responses. Through this tool, qualitative was collected.

### **Collecting data using Documents Review**

The principal researcher collected records of agricultural activities relevant to the study from the field officers. Of focus were those documents containing information on mango production and relating to mango processing and value addition activities. The researcher had a keen interest in

data that captured the number of mango projects in the area, those that involved women, and the feedback from those projects and related activities. This kind of data proved necessary for the study since it was used to triangulate data from primary sources and fill in gaps in the primary sources.

### **3.5. Data Presentation and Analysis**

Quantitative data from questionnaires and documents reviews was transcribed, translated coded, and classified after which it was entered using the database software, SPSS, after which a regression analysis was conducted (see section 4.9). This software is preferable because it is suitable for quantitative data analysis (Mugenda and Mugenda, 2003). Checks, simple occurrences, and cross-tabs were used to detect inconsistencies, unaccounted for values, and misrepresentation of labels. Normality tests were carried out to determine if the collected data had a normal distribution and hence was suitable for parametric statistical analysis. The analysis process was guided by the study objectives.

Qualitative data from interviews were categorized using headings and subheadings after which it was thematically analyzed. The initial stages involved phonemically transcribing the recorded data and translating it to the English language after which thematic codes were developed. Analysis of qualitative data focused on these themes and conclusions then drawn based on the repeated occurrences of certain words, phrases, or statements within and across various categories of respondents and relating to objectives. After analysis, hypotheses were tested and conclusions were drawn. For instance:

H1 was concerned with the relationship between mango value addition activities and women economic empowerment. It was assumed that activities such as Sorting, Grading, Processing,

and Packaging of mangoes contributed towards women economic empowerment in Tana Delta Sub County.

In this regard, the independent variable was value addition activities whereas the dependent variable was economic empowerment. This hypothesis was tested by analyzing data from women mango producers, processors, and consumers. The indicators of economic empowerment included economic independence, family support, and meeting financial needs out of involvement in mango value addition activities.

H2 was concerned with the level of economic empowerment resulting from the specific mango value addition activities. It assumed that the level of women economic empowerment was not affected by the type of mango value addition activities. Therefore, the independent variable was the type of value added activity whereas the dependent variable was the level of economic empowerment. This hypothesis was tested by analyzing data from questionnaires and interviews. The indicators of the level of economic empowerment included domestic (primary needs) and non-domestic (secondary and tertiary needs) economic independence.

### **3.6. Validity of the Instruments**

Mugenda and Mugenda (2013) opine that instrument validity is extent to which the instrument measures what it purports to measure. It is the degree to which the analyzed data would represent the phenomenon under study. To realize instrument validity for this study, data collection instruments were adequately evaluated by experts from the department of Plant Science and Crop Protection, of The University of Nairobi. The ratings of these experts were then compared in a session involving both the experts and the researcher, before data collection, and the necessary inco-operations were made.



### **3.7. Ethical Considerations**

The researcher sought for permission to carry out the study from The University of Nairobi Graduate School and NACOSTI offices where necessary. Once the researcher was cleared to conduct the study, he organized to meet the participants and explain the aim and importance of the research to all of them and seek their consent to be involved. It is worth noting here that, it is only those respondents who consented to participate and signed the consent forms that were included in the study (see Appendix IV Consent form). Respondents were reassured of anonymity and confidentiality of the information given. They were informed of their free will to participate in the study. They were informed that they were free to discontinue participation in the study at any point without any victimization. They were also informed that their contribution was to be used for the study only and that their identities would remain anonymous throughout the study and thereafter. Once the respondents' consent was obtained, a schedule of activities was drawn and the process of data collection began.

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

#### **4.1 Introduction**

This chapter presents the results obtained from the field study and outlines their significance to the study in relation to the objectives. The current study was carried out in Tana Delta Sub County, Tana River County, Kenya. It was on the effects of mango addition activities on the economic empowerment of women. All analysis of quantitative data uses descriptive statistics. Frequencies were obtained and expressed in percentage form while qualitative data was analyzed through content analysis. The outcome from the quantitative data are in form of tables, figures, and percentages presented and discussed descriptively, while that of qualitative data are presented in themes and subthemes and discussed in paragraphs and sentences. It is hoped that the results from the analyzed data will be of importance to organizations sponsoring women economic oriented programs in Tana river county, and Kenya in general, recognize the importance of consistency when implementing these programs.

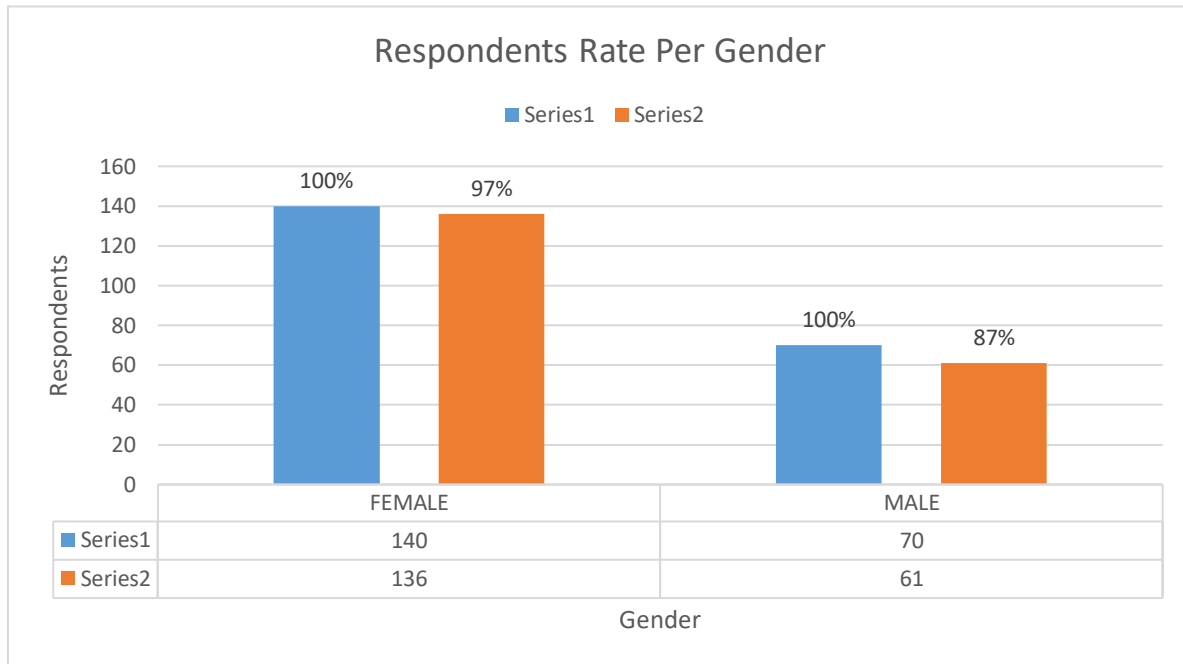
The data presented is interpreted towards answering the two objectives of the study which include:

- i. To examine the effect of mango value addition activities on women's economic empowerment.
- ii. To evaluate the level of women's economic empowerment through the type of mango value addition activities involved.

#### **4.2 Questionnaire Return Rate**

The completion rate was calculated by getting the difference between the distributed number of questionnaires as intended and the actual number of questionnaires filled. The analysis and

interpretation of the collected data from mango producers was based on the returned questionnaires, as shown in Figure 4.1



**Figure 4.1: Respondents Rate of Return**

From figure 4.1, the number of total respondents targeted was 210, while 197 respondents returned the questionnaire. Above 95% return rate was realized with this return rate. As Mulusa (1990) observes, a 50% return rate is sufficient for data to be considered adequate for analysis. Above 95% rate was therefore very good enough to provide the required information for addressing the goals of the study.

### 4.3 Demographic Characteristics

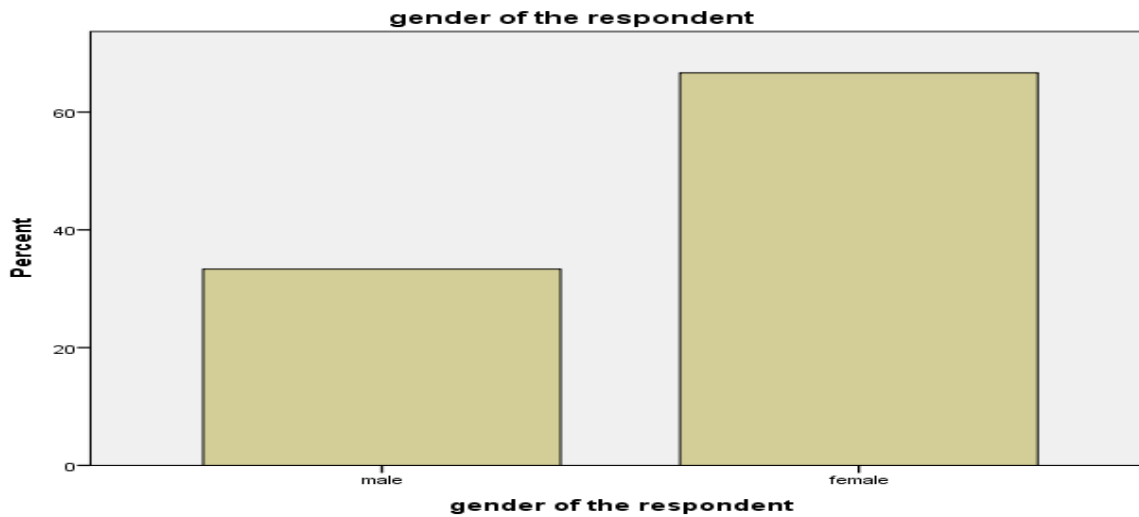
Individual characteristics and personal attributes of the participants included gender, marital status, age, and level of education. These were considered to be important attributes because they would shed light on the category of respondents involved in mango value addition activities and

what their opinion was towards women's economic empowerment.

### 4.3.1 Gender

**Table 4.1: Gender of the Respondents**

		Percent	Valid Percent	Cumulative Percent
	male	33.3	33.3	33.3
	female	66.7	66.7	100.0
	Total	100.0	100.0	



**Figure 4.2: Gender of the Respondents.**

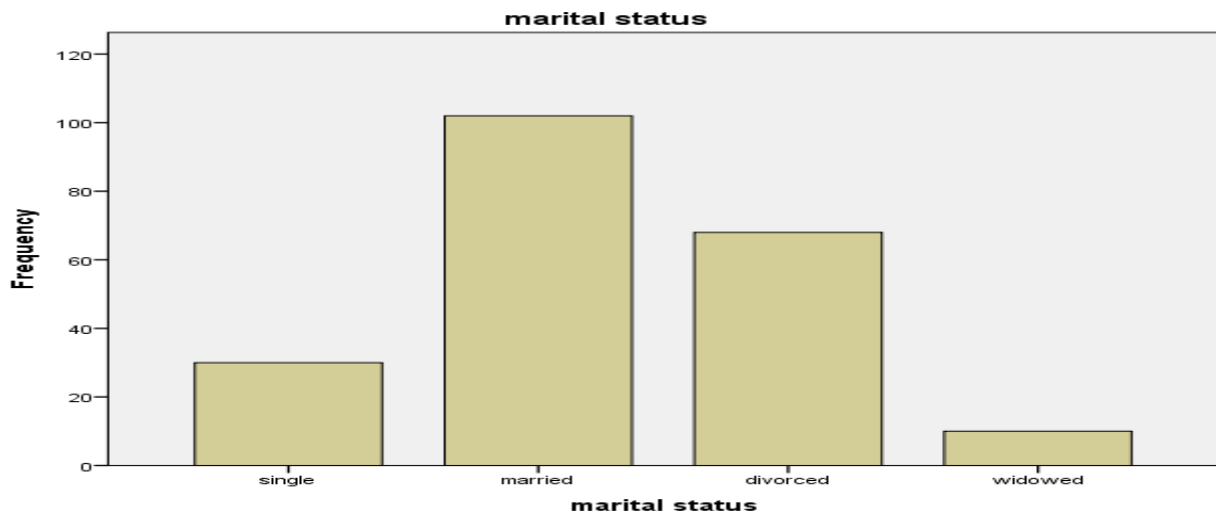
From figure 4.2, the percentage of female respondents who were involved in the study was 66.7%, while 33.3% of the respondents were male. There were more females involved in the research because women were the object of study and the main purpose for which the research was carried out was to find out the effect of mango value addition activities on their economic

development. However, it was prudent to include male respondents in the study to find their opinion of the activities and whether they impact positively on women’s economic empowerment.

### 4.3.2. Marital Status

**Table 4.2: Marital status of the Respondents**

		Frequency	Percent	Valid Percent	Cumulative Percent
	single	30	14.3	14.3	14.3
	married	102	48.6	48.6	62.9
	divorced	68	32.4	32.4	95.2
	widowed	10	4.8	4.8	100.0
	Total	210	100.0	100.0	



**Figure 4.3: Marital status of the respondents.**

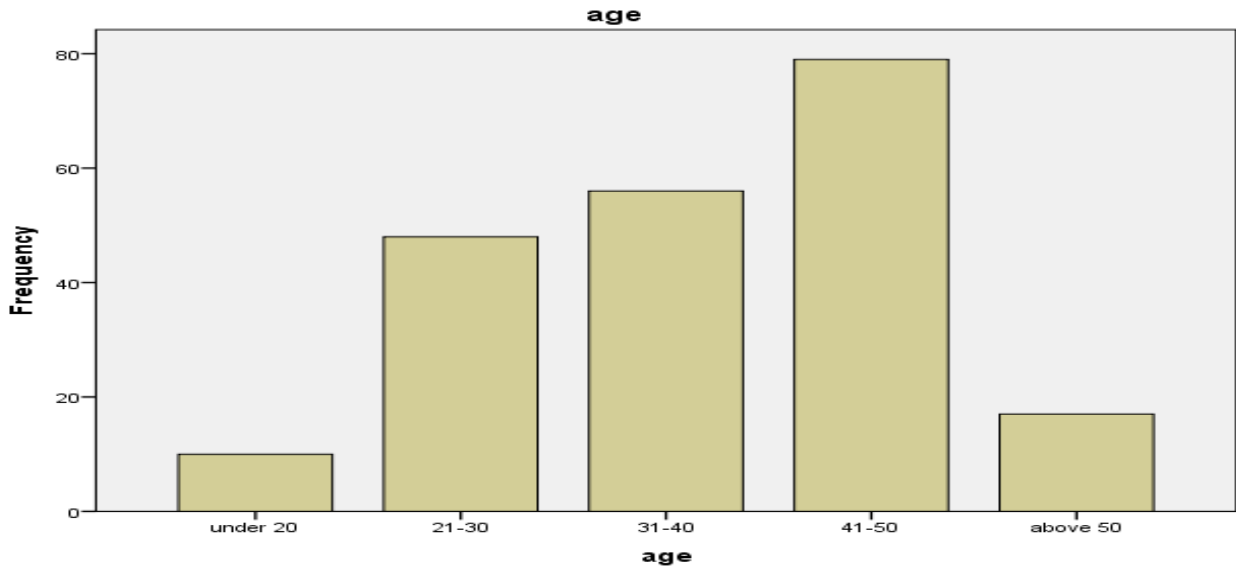
From Figure 4.3 most of the respondents, 48.6% were married, followed by divorced/separated at 32.4% then single at 14.3% and finally 4.8% of the participants were widowed. This indicated that family people chose to be involved in mango value addition activities. This may have been prompted by the need to provide for family economic needs. Relating marital status to gender, it is revealed that most married women from the population were involved in the mango activities, and owing to the fact that they have accomplished on basic education, this is interpreted as the ‘those women who are married and with poor education are likely to be involved in mango value education activities.

### 4.3.3 Age

This was a key parameter in determining the effect of mango value addition activities on economic empowerment for women. Age is a key aspect since it determines the involvement in a specific value addition activity to determine whether young women are involved in sorting while older ones are in grading.

**Table 4.3: Age of the Participants**

		Frequency	Percent	Valid Percent	Cumulative Percent
	under 20	10	4.8	4.8	4.8
	21-30	48	22.9	22.9	27.6
	31-40	56	26.7	26.7	54.3
	41-50	79	37.6	37.6	91.9
	above 50	17	8.1	8.1	100.0
	Total	210	100.0	100.0	



**Figure 4.4: Age of the respondents**

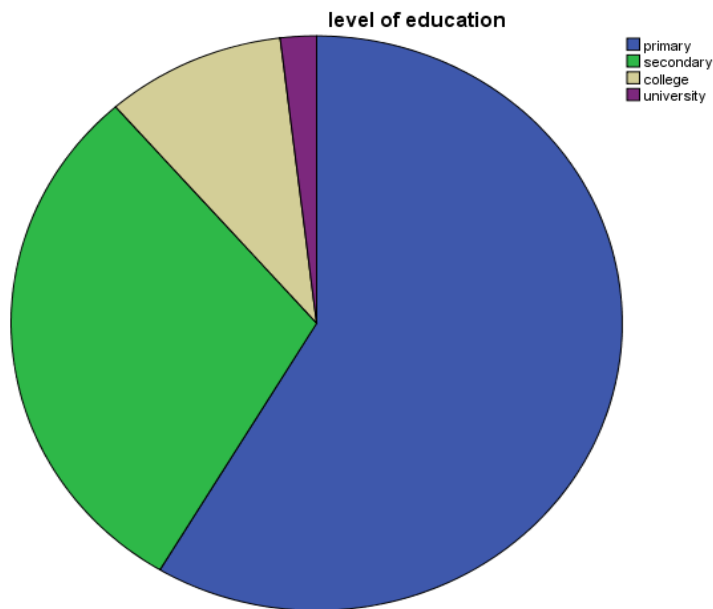
From Fig. 4.4, most of the respondents, 37.6% were aged between 41-50, followed by 26.7% of those aged 31-40 years old. Those below 20 years, 4.8% were the least involved in mango value addition activities. This statistic reveals that majority of the participants were mature enough to make a decision to be involved in the activities as a source of livelihood and not just as a way of passing time as they wait to go into other career paths.

#### **4.3.4 Level of Education**

Education level determines the access of opportunities for women. It is argued that the more years one has spent in education the better their chances of economic empowerment. Education positively impacts the uptake of certain activities in both self-employment and other employment.

**Table 4.4: Level of Education of the Respondents.**

		Frequency	Percent	Valid Percent	Cumulative Percent
	primary	123	58.6	58.6	58.6
	secondary	63	30.0	30.0	88.6
	college	20	9.5	9.5	98.1
	university	4	1.9	1.9	100.0
	Total	210	100.0	100.0	



**Figure 4.5: Level of education of the Respondents**

From Figure 4.5 it is clear that a higher rate of the respondents (58.6%) had attained a basic/primary certificate level of education. Few had completed secondary school (at 30.0%) and fewer had attained college and university education at 9.5% and 1.9% respectively. This shows

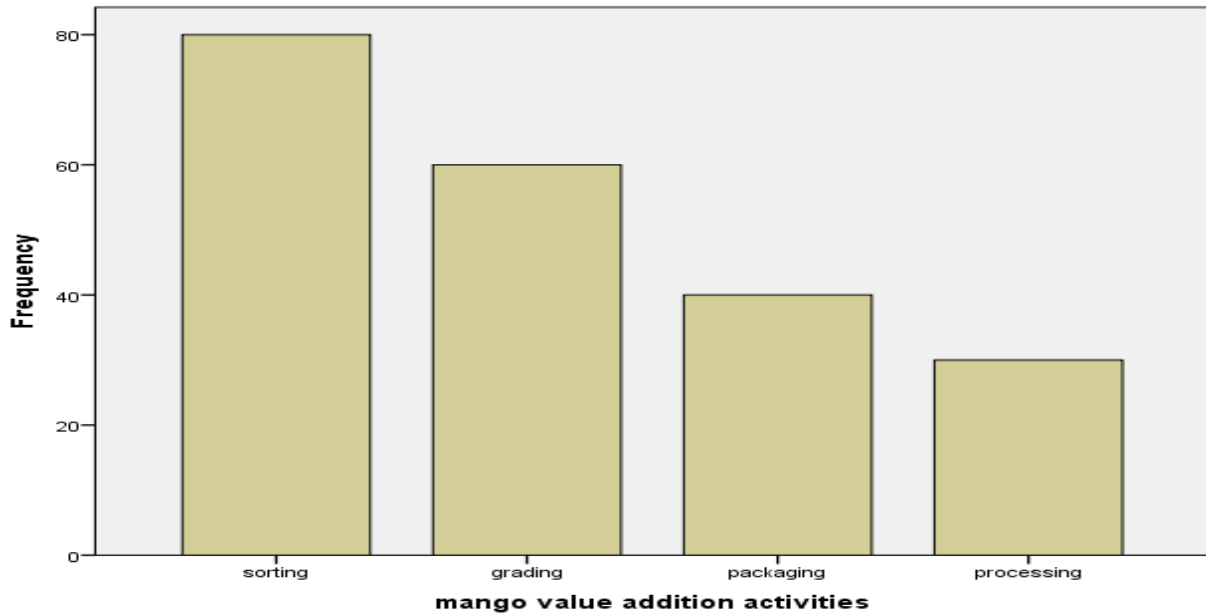


that respondents with only basic education are likely to take up mango value addition activities as a source of income in the Tana Delta Sub County

#### **4.4 Frequency of Mango Value Addition Activities on Women’s Economic Empowerment.**

Mango value addition activities were categorized into four subgroups: sorting, grading, packaging, and processing. Respondents were expected to indicate ways in which each of the activities enhanced their economic well-being.

	Frequency	Percent	Valid Percent	Cumulative Percent
sorting	80	38.1	38.1	38.1
grading	60	28.6	28.6	66.7
packaging	40	19.0	19.0	85.7
processing	30	14.3	14.3	100.0
Total	210	100.0	100.0	



**Figure 4.6: Summary of Mango Value Addition Activities.**

Figure 4.6 is a summary of the kind of activity in which respondents were involved in. From the outcome, it is realized that the majority of participants were involved in sorting, followed by grading, packaging, and processing in that order. Majority of the respondents stated that they participated in mango sorting activities. This was at 38.1% outcome which shows that this activity is very popular among the respondents. 28.6% of the respondents agreed to have been involved in grading activities, this figure shows that this activity is equally a preferred choice for the respondents. Packaging was at the third position with a percentage rate of 19%. Processing was the least popular at 14.3%. The reason behind this as would later be realized from interviews was because processing required specific skills. Responses from interviews indicated the importance of these value addition activities in the mango production channel. C3 had this to say, *‘graded mangoes are sold at different prices and bring more money to farmers in comparison to non-graded mango fruits. Mango buyers come from Malindi, Mombasa, Nairobi, Thika, and Nakuru to buy mangoes and they prefer the nicely graded ones’*.

From the aforementioned it is clear that all mango value addition activities are a choice for the respondents, hence giving the researcher confidence that the activities must be of importance to the respondents in the manner explained in the next section.

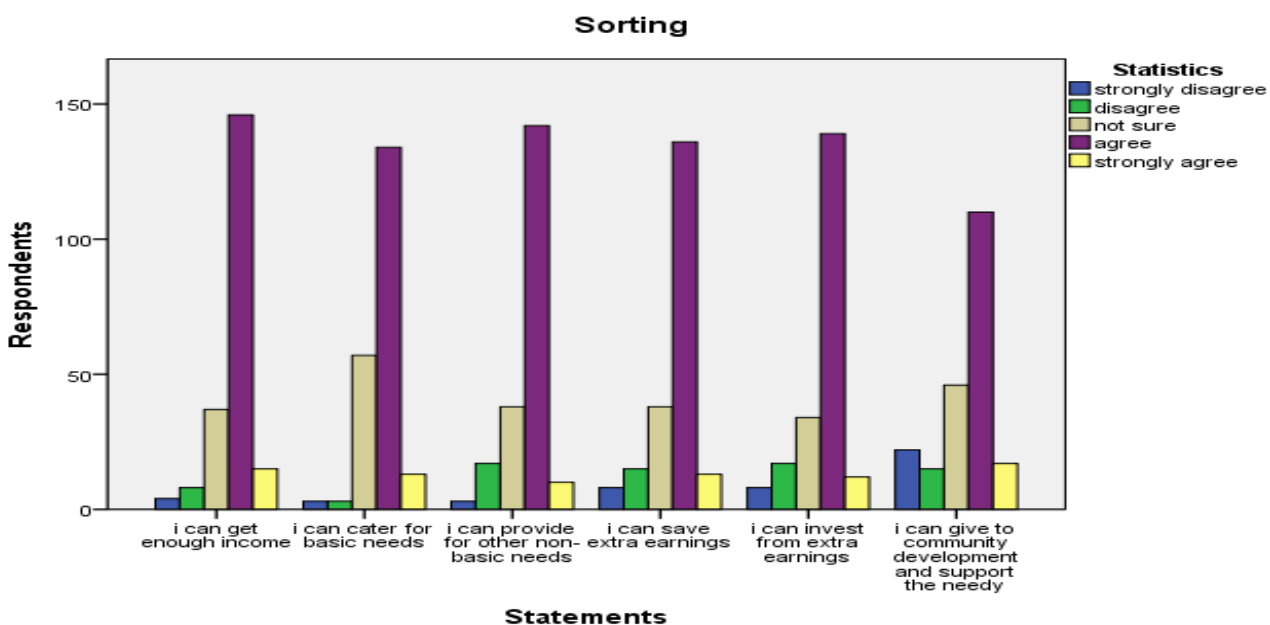
C1 stated that *mango traders who package well their mango fruits fetch more returns compared to those who did not package their fruits adequately.*

#### **4.5 Effect of Mango Sorting Activities on Women's Economic Empowerment.**

From the questionnaire items, the following questions were posed. Whether the respondent gets enough income from sorting, whether they can cater for their basic needs based on the income from sorting activities, whether they can provide for other non-basic needs, whether they can save extra earnings, whether they can invest the extra earnings and whether they can give to community development and support the needy from their earnings out of the sorting activities.

#### **Table 4.6: Effect of Mango Sorting Activities on Women's Economic Empowerment.**

	I can get enough income	I can cater for basic needs	I can provide for other non-basic needs	I can save extra earnings	I can invest from extra earnings	I can give to community development and support the needy
strongly disagree	1.9	1.4	1.4	3.8	3.8	1.4
disagree	3.8	1.4	8	7.1	8.0	7.1
not sure	17.6	27.1	18	18.0	16.1	21.9
agree	69.5	63.8	67.6	64.7	66.1	52.3
strongly agree	7.1	6.1	4.7	6.1	5.7	8.0
Total	100%	100%	100%	100%	100%	100%



**Figure 4.7: Effect of Mango Sorting Activities on Women’s Economic Empowerment.**

In all instances, the respondents agreed to the statements. 70% of the respondents agreed that they can get income from the mango sorting activities, 64% supported that they can save extra earnings, 66% agreed that they can invest from the extra earnings, 63% stated that they can cater for the basic needs out of the earnings, while 67% and 52% agreed to be in a position to provide for other non-basic needs, and support the needy respectively. This finding is similar to what Mulinge (2015) realized while studying the effect of mango production on the economy in Kitui county. Mulinge's study showed that mango production contributed to the economic development of residents in Kitui through generating income for farmers. However, the level of value addition of mangoes in Kitui was low, which translated to low-income generation for farmers compared to a higher level of economic empowerment witnessed in this study.

This result indicates that a majority of the participants viewed sorting activities positively. They were able to be economically empowered by engaging in sorting. These figures were supported by interview respondents whereby AO13 stated that *'sorting is mainly done by women and children before mangoes are taken for trading. The women enjoy doing this work because it gives them a form of economic independence'*.

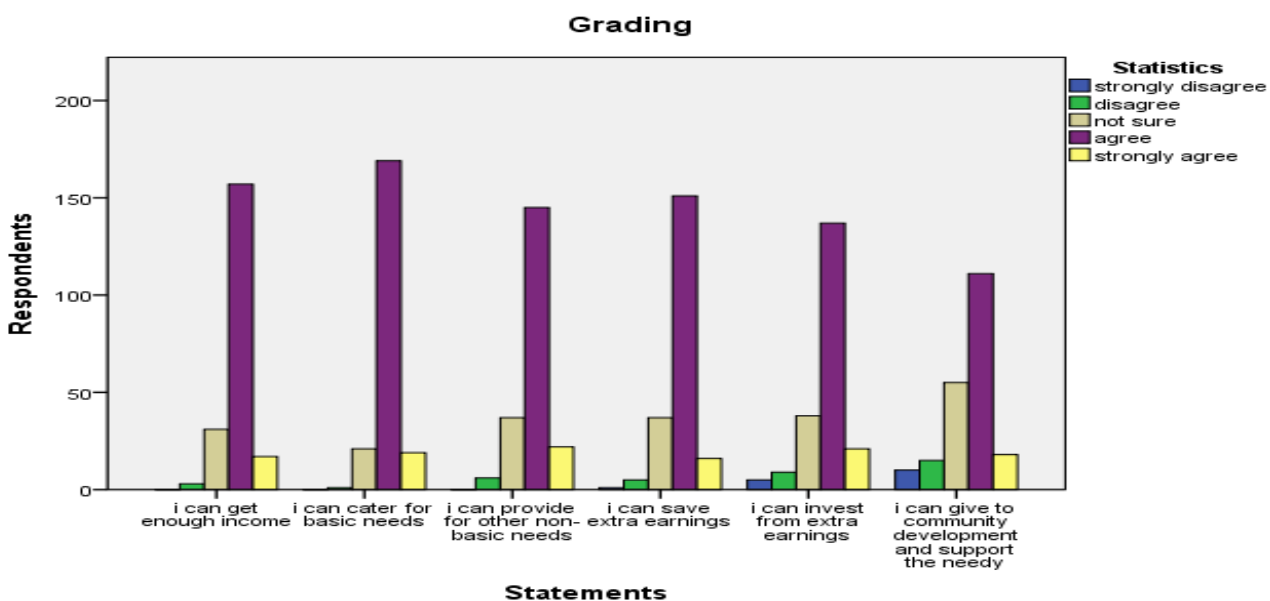
This confirms the first hypothesis which stated that mango value addition activities had a positive effect economic empowerment for women's in Tana Delta Sub County particularly with regard to sorting activities. From the findings, it is concluded that more women should be encouraged to participate in mango sorting activities to be economically empowered, particularly the women in Tana River who currently do not have a source of income. They should not be choosy and abhorrent to this activity since it can help them meet their economic needs. It also enables the researcher to suggest the non-governmental organizations and agriculturally based organizations invest more in mango sorting activities to be able to empower more women economically.

#### **4.6 Effect of Mango Grading Activities on Women's Economic Empowerment.**

The researcher also set out to study the effect of mango grading activities on women's economic empowerment in the Tana River. The questionnaire items sought to find information on whether the respondents got enough income from grading activities, whether they were able to cater for their basic needs based on the income from sorting activities, whether they could provide for other non-basic needs, whether they were able to save extra earnings, whether they could invest the extra earnings and whether they could give to community development and support the needy from their earnings out of the grading activities. The outcome is as indicated in Table 4.7 and Figure 4.8.

	I can get enough income	I can cater for basic needs	I can provide for other non-basic needs	I can save extra earnings	I can invest from extra earnings	I can give to community development and support the needy
strongly disagree	0	0	0	0.4	2.3	4.7
disagree	1.4	0.4	2.8	2.3	4.2	7.1
not sure	14.7	10	17.6	17.6	18.0	26.1
agree	74.7	80.4	69	71.9	65.2	52.8
strongly agree	8	9	10.4	7.6	10	8.5
Total	100%	100%	100%	100%	100%	100%

**Table 4.7: Effect of Mango Grading Activities on Women’s Economic Empowerment.**



**Figure 4.8: Effect of Mango Grading Activities on Women’s Economic Empowerment.**

Again, just as it was indicated at the sorting level, in all questions relating to grading, the respondents agreed to be benefitting. For instance, 75% of the respondents agreed that they can get income from the mango grading activities, 71% supported the position that they can save extra earnings, 65% agreed that they can invest from the extra earnings, 80% stated that they can cater for the basic needs out of the earnings, while 69% and 52% agreed to have been in a position to provide for other non-basic needs, and support the needy respectively. This finding reveals that grading activities were considered to be important for economic empowerment. The finding was corroborated with responses from AO2 who said that ' *although it is women who practice small scale mango grading in most cases before mangoes are taken to open-air market for selling, these women earn something from the grading activities and though small it helps them meet their needs rather than men who are involved in drugs and other vices.*

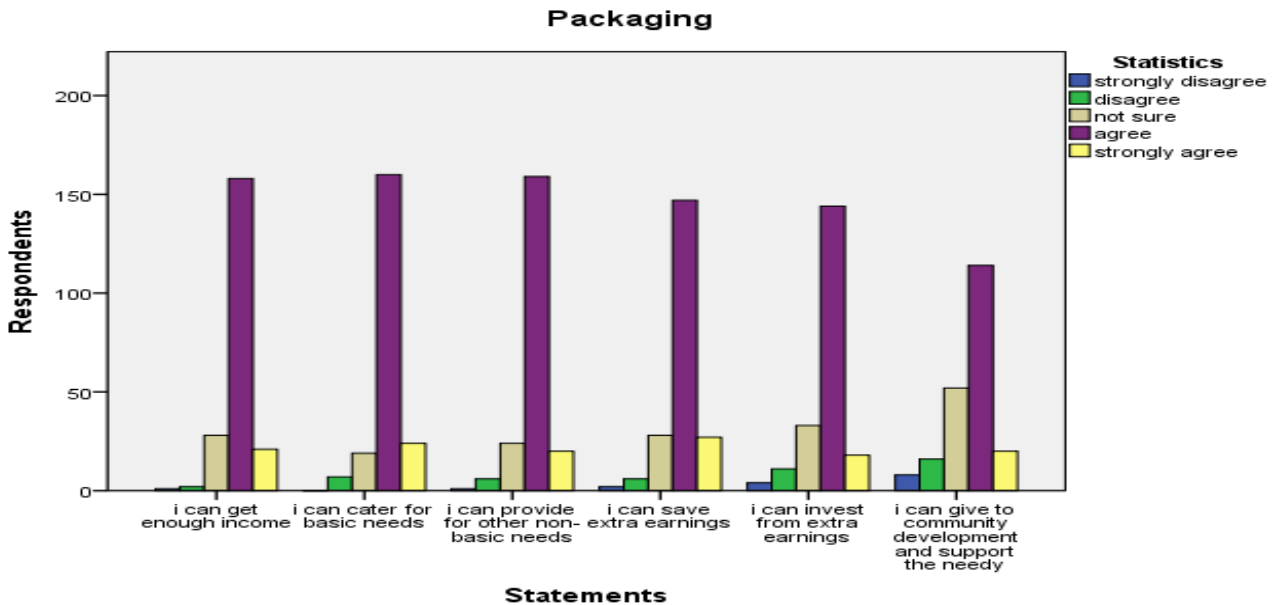


#### 4.7 Effect of Mango Packaging Activities on Women’s Economic Empowerment.

The researcher also set out to examine the effect of mango packaging activities on women’s economic empowerment in the Tana River. The questionnaire items sought to find information on whether the respondents got enough income from packaging activities, whether they were able to cater for their basic needs based on the income from packaging activities, whether they could provide for other non-basic needs, whether they were able to save extra earnings, whether they could invest the extra earnings and whether they could give to community development and support the needy from their earnings out of the packaging activities. The outcome is as indicated in Table 4.8 and Figure 4.9.

	I can get enough income	I can cater for basic needs	I can provide for other non-basic needs	I can save extra earnings	I can invest from extra earnings	I can give to community development and support the needy
strongly disagree	0.4	0	0.4	0.9	1.9	3.8
disagree	0.9	3.3	2.8	2.8	5.2	7.6
not sure	13	9	11.4	13.3	15.7	24.7
agree	75.2	77.1	75.7	70	68.5	54.2
strongly agree	10	11.4	9.5	12.8	8.5	9.5
Total	100%	100%	100%	100%	100%	100%

**Table 4.8: Effects of Mango Packaging Activities on Women’s Economic Empowerment**



**Figure 4.9: Effects of Mango Packaging Activities on Women Economic Empowerment**

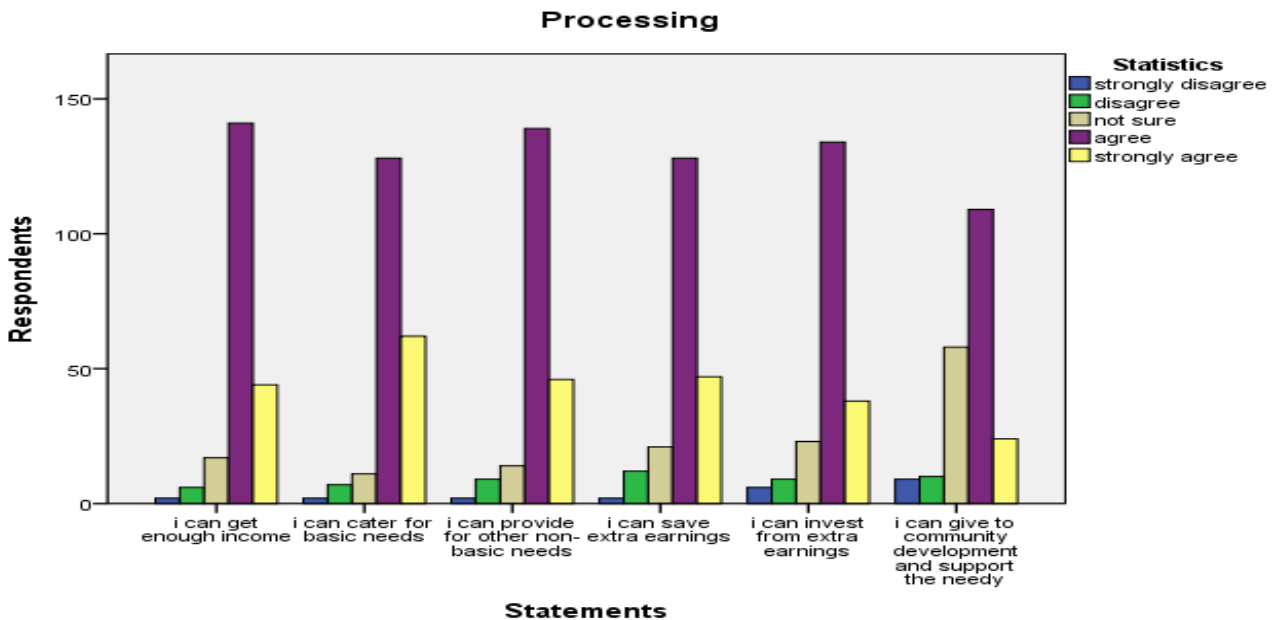
The results revealed that in all instances relating to packaging, the respondents agreed to be economically empowered. In this case, however, more respondents agreed to be investing extra earnings at 60% compared to sorting and grading where a higher percentage had agreed to be getting enough income. In this case also, more respondents, at 54% agreed to be giving to community development and supporting the needy compared to those in the sorting and grading categories. 60%, 70%, and 75% of respondents agreed to be able to cater for their basic needs, save extra earnings and provide for other non-basic needs respectively. This finding shows that those involved in mango packaging activities were earning more than those in sorting and grading hence were able to invest the extra earnings. Investing was in most cases done after basic and non-basic needs had been met. On this aspect, interviewees stated that it is women who do the packaging while men and youth carry the boxes to the vehicles for transportation to different places. As AO12 says, *'mangoes are packaged in boxes by women and youth before they are carried to buses and pickups after which they are transported to different markets outside the sub-county like Mombasa, Malindi,Thika,Nairobi, and Nakuru'*. Packaging skills need to be enhanced to preserve the quality of the mango fruit reaching the market'.

#### 4.8 Effect of Mango Processing Activities on Women’s Economic Empowerment.

The research was also set to find out the effect of mango processing activities on women’s economic empowerment in the Tana River. The questionnaire items sought to find information on whether the respondents got enough income from processing activities, whether they were able to cater for their basic needs based on the income from packaging activities, whether they could provide for other non-basic needs, whether they were able to save extra earnings, whether they could invest the extra earnings and whether they could give to community development and support the needy from their earnings out of the processing activities. The results are as depicted in Table 9 Figure 4.10

	I can get enough income	I can cater for basic needs	I can provide for other non-basic needs	I can save extra earnings	I can invest from extra earnings	I can give to community development and support the needy
strongly disagree	0.9	0.9	0.9	0.9	2.8	4.2
Disagree	2.8	3.3	4.2	5.7	4.2	4.7
not sure	8.0	5.2	6.6	10	10.9	27.6
Agree	67.1	60.9	66.1	60.9	63.8	51.9
strongly agree	20.9	29.5	21.9	22.3	18.0	11.4
Total	100%	100%	100%	100%	100%	100%

**Table 4.9: Effect of Mango Processing Activities on Women Economic Empowerment.**



**Figure 4.10: Effect of Mango Processing Activities on Women’s Economic Empowerment.**

From Figure 4.10, it is clear that in all instances relating to processing, the respondents agreed to be economically empowered. In this activity, however, getting enough income took the lead with 67%. Respondents also agreed to be able to save extra earnings at 60% and catering for basic needs at 60%. This finding is contrary to what Mulinge (2015) realized while studying the effect of mango production on the economy in Kitui county. Mulinge’s study showed that the level of value addition of mangoes in Kitui was low, which translated to low-income generation for farmers. It was recommended that value addition marketing and processing technologies be adopted in the county to improve mango shelf-life and enhance income for farmers. Even so, Mulinge’s findings are important to this study since the importance of mango production to farmers and ultimately to the economy of Kenya in general is acknowledged. Interviewees stated that the availability of a processing plant at Garsen and Hola makes it easier for locals to get

involved in one way or another, this enhances their economic power since they can report to the plants daily from their homes instead of going to look for jobs in far off counties.

AO5 had this to say, *'the mango processing plant at Garsen owned by Tanariver mango marketing cooperative society and the one (Galole mango processing plant owned by Cost Development Authority) at Hola have helped farmers a great deal. They have somewhere to sell their products and still be employed as workers.'*

Giving to community development and supporting the needy was the least popular with only 51% of respondents agreeing to be doing this. From the four activities, it manifests that those who were involved in sorting and grading earned enough income which they spent on basic needs, while those who were in packaging and processing earned enough income from which they saved and invested extra earnings.

These rates are lower in all cases than those who agreed, implying that most people only agree that the mango processing activities have economically empowered women yet not to the best extent which therefore translates that more needs to be done. This result is important and relates to what was suggested by FSD (2015). The researchers suggested that diverse value addition activities be implemented to curb the losses and ease pressure in the local mango market. These value addition activities were also to constitutive of a source of income for small-scale farmers most of whom were women, thus the need for the current study. Their recommendations were prompted by their findings which indicated that most farmers were struggling economically because they lacked the know-how to operate the mango production technologies, they foresaw a need to involve small-scale farmers in mango value addition activities. This research has revealed that their recommendation was appropriate. It has also shown the value of follow-up research in agricultural projects and activities.

## 4.9 Regression Analysis

### 4.9.1 Model Summary

**Table 4.10: Model Summary.**

Model Summary							
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.995 <sup>a</sup>	.991	.991	.01054	.991	5551.134	4

From the model summary it's clear that the model of women economic empowerment against the independent variables (sorting, grading, packaging and processing) was well fitted since from the table above the R square was 0.991 which can be interpreted as the total changes in women economic empowerment in Tana delta was explained by the mango value addition activities for about 99.1 % whereas the other 0.9 % remaining was accounted for by other factors not included in this study.

## 4.9.2 Anova

**Table 4.11: Anova table**

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.468	4	.617	5551.134	.000 <sup>b</sup>
	Residual	.023	205	.000		
	Total	2.490	209			

a. Dependent Variable: WomenEmppowerment

b. Predictors: (Constant), processing, sorting, grading, packaging

ANOVA in this study was applied to test the model adequacy or statistically significance of the regression coefficients. From the table above the model used was adequate for further statistical use of the research findings this was because the sig. value (0.000) was less than 0.05 therefore the outputs of this study are valid and can be used for further research.

### 4.9.3 Regression Coefficients

**Table 4.12 : Coefficients**

Coefficients <sup>a</sup>						
Model	Unstandardized Coefficients		Standardized	t	Sig.	
	B	Std. Error	Coefficients			
	(Constant)	1.622	.008		200.178	.000
	sorting	.070	.001	.434	52.034	.000
1	grading	.069	.002	.273	34.479	.000
	packaging	.076	.002	.337	41.860	.000
	processing	.073	.001	.399	56.082	.000

Independent variables used were positive and statistically significant because from the table above their respective sig. values (0.00) are less than 0.05. The constant (1.622) can be interpreted as the value of women economic empowerment when all factors are held constant, packaging contributed the most since it had a coefficient of 0.076 followed by processing with a beta coefficient of 0.073 then sorting had a coefficient of 0.07 and lastly grading with a coefficient of 0.069.

Since women economic empowerment was a function of all the value addition activities on mango, the regression equation therefore is as follows;

Women economic empowerment=f (sorting, grading, packaging and processing)

$$Y=1.622 + 0.07\text{sorting} + 0.069\text{grading} + 0.076\text{packaging} + 0.073\text{processing}$$



From the findings above, packaging had the more value on the economic empowerment therefore it is recommended that famers should not only be engaged on sorting but also be engaged on packaging and processing since these activities have more economic value as per the research output above.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS**

#### **5.0 Introduction**

This chapter presents a summary of the findings arrived at, from the data analysis and discussion. It also provides the conclusions arrived at with regard to the objectives of the study, in Tana River. It also outlines the recommendations for policymakers and government bodies and suggestions for areas of focus for future research.

#### **5.1 Summary**

The main purpose of this study was to find out the effect of mango value addition activities on women's economic empowerment in Tana River County. The methodology comprised of the research design, target population, sample size and sampling procedure, research tools and instruments, data collection and analysis procedures, data presentation, and the ethical considerations. Quantitative data were analyzed with the use of descriptive statistics and presented using tables and figures. Qualitative data were examined using thematic analytical procedures and presented using paragraphs and sentences. From the findings, more women than men were involved in mango value addition activities; middle-aged members, 40-50 years of age were involved more than those in other age brackets. On education, most of those who participated in the study had only completed primary level of education and were married.

The study established that mango value addition activities had a positive impact on economic empowerment for women in Tana River county. Women who were involved in sorting, grading processing and packing mangoes were able to provide for basic and non-basic needs, to save and invest, all from the income yielded out of their involvement in these activities.

With regard to the second objective, the study established that mango value addition activities had impacted women's economic empowerment to a larger extent. Grading had a greater impact at 95%, packaging at 94% while sorting and processing had impacted at 91 and 88% respectively.

From the findings on the specific questions, particularly the four activities, it is manifested that those who were involved in sorting and grading earned enough income which they spent on basic needs, while those who were in packaging and processing earned enough income from which they saved and invested extra earnings, this implies that there was a positive perception with regard to all the activities even though the income from each was put into different use. Also, most respondents agreed that the mango processing activities have economically empowered women yet not to the best extent which therefore translates that more needs to be done since value addition activities are of high economic value to the women residents of Tana River County.

### **5.3 Conclusion**

In reference to the summary, these conclusions are drawn:

That mango value addition activities had a positive effect on women economic empowerment in Tana River. From the findings, women who were involved in mango sorting, grading, packaging and processing activities earned income from which they met their basic needs, contributed to community development, saved and invested at different levels. Secondly, women were involved in mango value addition activities to a large extent as a source of livelihood. Specifically, 100% of the respondents were involved in sorting, 84% in grading, 71% in packaging, and 70% in processing activities. From these activities, women are economically empowered in different

ways such as, meeting their basic needs at 78%, contributing to community development at 61%, and saving/investing at 86%. It is also clear that women are actively saving and investing returns from mango value addition activities.

#### **5.4 Recommendations**

From the conclusions it is recommended that:

Organizations involved in agricultural activities in Tana River County need to enhance the training of women on value addition activities at all stages of mango production.

Women need to be trained on how to identify quality mangoes as a way of enhancing their grading skills.

Processing plants in Garsen and Hola need to employ more women to empower more since the findings show that these activities are of economic value to the residents.

The county government needs to organize benchmarking visitations for women involved in mango processing activities to other counties doing well in mangoes processing such as Kitui County.

There is need to formulate policies on mango value addition and women economic empowerment in Tanariver county.

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## APPENDICES

### Appendix I: Questionnaire on Mango Value Addition Activities

This questionnaire is meant to collect information on the *effects of mango value addition activities on women economic empowerment in Tana Delta Sub county*. You have been selected to participate in this study as one of the respondents. The information you will give will be treated with utmost confidentiality and will be used for the purpose of this research only. Please complete the questionnaire appropriately and truthfully. You do not have to write your name.

#### Section A: General Information

##### Tick the most appropriate

1. Gender of the respondent:

Male                      Female

2. Marital status: Single      Married      Divorced/Separated      Widowed

3. Age: Under 20      20-30      30-40      40-50      Above 50

4. Level of Education: Primary                      Secondary                      College  
University

5. Have you ever been involved in any of the following mango activities?

Sorting                      Grading                      Packaging                      Processing



**Section B: Specific information**

**a) Effect of mango sorting activities on women economic empowerment**

Based on your knowledge and experience, using ticks ( ) indicate the statement that best explains the effect mango sorting activities have had on your economic empowerment. Where 1=Strongly Disagree, 2= Disagree, 3=Not sure, 4=Agree and 5=Strongly Agree

Statement	1	2	3	4	5
I can get enough income					
I can cater for basic needs					
I can provide for other non-basic needs					
I can save extra earnings					
I can invest from the extra earnings					
I can give to community development and support the needy					

Any other useful information, please indicate

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**b) Effect of mango grading activities on women economic empowerment**

Based on your knowledge and experience, using ticks ( ) indicate the statement that best explains the effect mango grading activities have had on your economic empowerment. Where 1=Strongly Disagree, 2= Disagree, 3=Not sure, 4=Agree and 5=Strongly Agree

Statement	1	2	3	4	5
I can get enough income					
I can cater for basic needs					
I can provide for other non-basic needs					
I can save extra earnings					
I can invest from the extra earnings					
I can give to community development and support the needy					

Any other useful information, please indicate

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**c) Effect of mango packaging activities on women economic empowerment**

Based on your knowledge and experience, using ticks indicate the statement that best explains the effect mango packaging activities have had on your economic empowerment. Where 1=Strongly Disagree, 2= Disagree, 3=Not sure, 4=Agree and 5=Strongly Agree

Statement	1	2	3	4	5
I can get enough income					
I can cater for basic needs					
I can provide for other non-basic needs					
I can save extra earnings					
I can invest from the extra earnings					
I can give to community development and support the needy					

Any other useful information, please indicate

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**d) Effect of mango processing activities on women economic empowerment**

Based on your knowledge and experience, using ticks ( ) indicate the statement that best explains the effect mango processing activities have had on your economic empowerment. Where 1=Strongly Disagree, 2= Disagree, 3=Not sure, 4=Agree and 5=Strongly Agree

Statement	1	2	3	4	5
I can get enough income					
I can cater for basic needs					
I can provide for other non-basic needs					
I can save extra earnings					
I can invest from the extra earnings					
I can give to community development and support the needy					

Any other useful information, please indicate

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**Thank you very much for participating in this research, and for filling this questionnaire.**

**Be blessed.**

## **Appendix II: Interview Guide for Agricultural officers and Area Chiefs**

Dear Respondent,

You have been selected to participate in this study on the *Effects of Mango Value Addition Activities on Women Economic Empowerment in Tana Delta Sub County*. Kindly answer the questions asked according to your knowledge in this area, no answer is wrong. The information you will give will be treated with utmost confidentiality and will be used for the purpose of this research only. Please do not mention any names and you are not coerced to answer any question you are uncomfortable with.

- a) What is the main importance of mangoes in this region?
- b) Who are the people mostly involved in mango activities in this region?
- c) At family level, who owns mangoes?
- d) Do mangoes have any economic value at family level?
- e) What is the effect of mango sorting activities on women economic empowerment?
- f) What is the effect of mango grading activities on women economic empowerment?
- g) What is the effect of mango packaging activities on women economic empowerment?
- h) What is the effect of mango processing activities on women economic empowerment?

### Appendix III: List of Interviewed Area Chiefs

S/NO	NAME OF ZONE/LOCATION	CODE OF INTERVIEWED CHIEF
1	Shirikisho	C1
2	Mwina	C2

3	Salama	C3
4	Ndera	C4
5	Bilisa	C5
6	Ngao	C6
7	Oda Wachu	C7
8	Chara	C8
9	Konemasa	C9
10	Galili	C10
11	Kipao	C11
12	Kipini	C12
13	Ozi	C13
14	Kilelengwani	C14

**Appendix IV: List of Interviewed Agricultural Officers**

<b>S/NO</b>	<b>NAME OF ZONE/LOCATION</b>	<b>CODE OF INTERVIEWED AGRICULTURAL OFFICER</b>
1	Shirikisho	AO1
2	Mwina	AO2
3	Salama	AO3
4	Ndera	AO4
5	Bilisa	AO5
6	Ngao	AO6
7	Oda Wachu	AO7
8	Chara	AO8
9	Konemasa	AO9
10	Galili	AO10
11	Kipao	AO11
12	Kipini	AO12
13	Ozi	AO13
14	Kilelengwani	AO14



## Appendix V: Informed Consent Form

I Joseph Muhiri Swibe is carrying out a study titled *An Assessment of Effects of Mango Value Addition Activities on Women Economic Empowerment in Tana Delta Sub-County*

You have been selected to participate in this study as a respondent. You are therefore requested to give consent unconditionally for your participation. You are reassured that the information you give will be treated with utmost confidentiality and be used for the purpose of this study only. Your name will not be mentioned, except by your permission. Consequently you are requested to indicate in the space provided below by ticking your preferred option.

I accept  do not accept  to participate in this study as a respondent.

Researcher: Joseph Muhiri Swibe

Sign-----

