

**PERCEPTION OF STAKEHOLDER PRESSURE ON  
MECHANIZED HARVESTING TECHNOLOGY  
ADOPTION IN THE TEA SUBSECTOR IN KENYA**

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**(Business Administration)**

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AGRICULTURE AND TECHNOLOGY**

**2016**



**Perception of Stakeholder Pressure on Mechanized Harvesting  
Technology Adoption in the Tea Subsector in Kenya**

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**Thesis Submitted in Partial Fulfillment for the Degree of Doctor  
of Philosophy in Business Administration in the Jomo Kenyatta  
University of Agriculture and Technology**

**2016**

## DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

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## **DEDICATION**

To my wife Prisca and children namely Cynthia, Kelvin, Oliver and Yvonne

## **ACKNOWLEDGEMENT**

Foremost, I would like to thank the Almighty God for keeping me in good health during the period of carrying out this work. Secondly, my appreciation goes to all members of my family who have always been patient with me when I have even had to sacrifice important family time in order to beat the necessary deadlines for this work to be a reality. Thirdly, I wish to appreciate Dr. Margaret Oloko, Dr. Gladys Rotich and Dr. George Orwa all of Jomo Kenyatta University of Agriculture and Technology for accepting to be my supervisors and who spent a lot of their time reading through this work right from when it was just a nascent and obscure idea to what it has now become. Also much appreciation goes to Dr. Wario Guyo, the Deputy Director of JKUAT Nairobi CBD campus who also helped in making me understand that research is hinged on establishing what the real problem is. Last but not least I wish to thank my PHDBA classmates who in one way or another contributed in making me continue to walk the scholarly path.

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

**AFFA-** Agriculture, Foods and Fisheries Authority

**FAO** – Food and Agricultural Organization

**MTH** - Mechanized Tea Harvesting

**OECD-** Organization for Economic Cooperation and Development

**RoK** – Republic of Kenya

**R&D-** Research and Development

**TBK** – Tea Board of Kenya

**TRFK** – Tea Research Foundation of Kenya (Now Tea Research Institute)

## **OPERATIONAL DEFINITION OF TERMS**

### ***Stakeholder***

Stakeholder is understood from point of view of Freeman (1984) who defined stakeholder as “any group or individual who can affect or is affected by the achievement of the organization’s objectives”. Stakeholders therefore will include owners, employees, consumers, community and government a slight modification of Hyatt (2011) classification.

### ***Stakeholder pressure perceptions***

This is the cumulative effect of attributes of power, legitimacy and urgency of stakeholder’s claim (Agle, Mitchel & Sonnenfield, 1999) and as perceived by management of the firm.

### ***Innovation***

The study adopted OECD (2005) definition of innovation which is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations. Innovation was specifically narrowed to process innovation and operationalized by focusing on level of adoption of mechanized tea harvesting technology by firms in the plantation estates segment in the tea subsector in Kenya.

### ***Technology Adoption***

Adoption is seen as the first or minimal level of behavioural utilization. It is therefore a decision to make full use of an innovation as the best course of action available as applied by Rogers (2003).

## ABSTRACT

Tea subsector in Kenya is very critical to the overall economy. It is one of the major foreign exchange earners and supports 10 % of the Kenyan population. The viability of the tea subsector however has been under threat in the recent past. The subsector has experienced declining margins due to the double impact of rising cost of production and drop in global tea prices. The main driver of the cost of production in tea business is the wage bill as the tea crop is largely labour intensive. Since innovation has been identified as one of the vehicles that make organizations achieve competitiveness, the tea industry in Kenya has identified a type of process innovation which is comparatively cheaper such as mechanized tea harvesting technology to mitigate the high labour cost. The perplexing thing however is that the uptake of this technology is low despite its cost advantages. This study therefore provided an opportunity to empirically test the theoretical basis of this contradiction. It also sought to identify the drivers of this type of innovation in the tea subsector of Kenya by establishing how it is influenced by management perceptions of stakeholder pressure of namely owners, employees, customers, community and government stakeholder groups. Diagnostic survey research design was employed in the study because the study was concerned about associations between variables. The target population was all tea plantation firms in Kenya and managers in charge of these business units were the respondents. A census enquiry was used due the small nature of the target population. Data collection was done using a semi-structured questionnaire that targeted both quantitative and qualitative data. Data processing and analysis employed content analysis for qualitative data and logistic regression analysis for the quantitative. The results of the study indicated owners' pressure and customer pressure were positively significant at 5% level of significance. The beta coefficients were 3.043 and 2.034 whereas p values were 0.001 and 0.003 for the two variables respectively. Perception of employees influence on innovation was negatively significant at 5% level of significance with beta coefficient and p value being -1.463 and 0.016 respectively. Perception of community and governments influence on mechanized harvesting technology adoption was found not to be significant. The overall logistic model indicated a Nagelkerke R square of 0.84 meaning that the predictive value of the model was very good. The findings suggest that the three most important stakeholder groups in the tea subsector in Kenya with regard to firm's decision to adopt mechanized harvesting technology as perceived by management are owners, employees and customers. The findings are in consonance with expectation from both theory and past empirical research as far as owners, employees and customer stakeholder groups are concerned. It is therefore recommended that those firms in the tea industry intending to pursue MTH technology innovation as an option of cost mitigation must take into cognizance the views of owners, employees and customer stakeholder groups since they

are the most important in determining the success of innovation especially in the context of mechanized harvesting technology adoption in the tea subsector.



# CHAPTER ONE

## INTRODUCTION

This study sought to establish the perceptions of stakeholder pressure in the tea sub sector in Kenya. This chapter therefore provides a brief insight of the scope of study and goes forth to describe the background of tea industry from global and local perspectives, statement of the problem, objectives of the study, scope, justification and limitation of the study.

### **1.1 Background of the study**

The study sought to explore the influence of stakeholder pressure perceptions on mechanized harvesting technology adoption in the tea subsector in Kenya. Change is inevitable if businesses have to remain competitive. Organizations require novel ideas on product or services they offer. Johannessen (2009) argued that adoption of innovation may lead to improved operational efficiency, creation of better working practices, competitive advantage and flexibility that ensures sustainable development of companies in a dynamic changing business environment. Macgregor and Fontrodana (2008) argue that since customers and society have become extremely sensitive to the perceived ethical behaviour of organizations, companies must, in order to be to be successful and innovative today, consider the social and environmental impact of their operational processes, stimulate employees to be creative, and collaborate with their customers, suppliers and other business partners in designing and developing new products and services.

The business environment comprises of several players whose interests are often conflicting. Schiavone (2012) opines that new changes in an organization have to be filtered in these groups through discourse and negotiations. If the change does not fit into interests and values of the group, adoption is likely not to be feasible. Decisions, especially those that bring radical changes in the way business is run therefore need to

incorporate the views of those who stand to be affected by the decisions if successful implementation of change has to occur.

### 1.1.1 Innovation

OECD (2005) defines innovation as the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations. Hoffmann (2005) considers it as not only new products and equipment but also new methods and ideas. According to Schumpeterian logic, innovation relates to changes small or large that have a significant impact on the structural changes in individual industries and market segments (Kotsemir & Abroskin, 2013). Schumpeter distinguished between five different types of innovation; new products, new methods of production, new sources of supply, the exploitation of new markets and new ways to organize business.

Two major aspects of innovation can therefore be distinguished in general. First, innovation as a process that encourages change otherwise referred to as process innovation and secondly innovation as an event, object, or a discrete product characterized by novelty otherwise referred to as product innovation (Cooper, 1998; Gopalakrishnan & Damanpour, 1997). The Schumpeterian concept of innovation views new production methods as not necessarily based on new scientific discoveries. A firm which therefore uses for the first time technologies that have already been applied in other industries can be considered as innovative. Lambooi and Hummel (2013) points out that adoption of an innovation is experienced when an actor start to use or implement an innovation, a view shared by Heunks (1998) who described innovation as the successful technical and economic implementation of an idea. Innovation happens when the perceived benefits of using the innovation outweigh the perceived costs and leads to an improvement on the current situation. The goal of innovation therefore is value addition and having positive impact on the

operation and development of organizations and may include only the changes that have favorable consequences for organizations (Kotsemir & Abroskin, 2013).

Innovation provides opportunities for businesses to improve their efficiency and effectiveness and even to gain competitive advantage. Bowman and Elfat (1998) have linked performance in business organizations to strategic choice and action. The decision to adopt or not to adopt a specific technology can therefore distinguish performing firms from non performing ones. Olsen and Engen (2007) however posit that technological change is deeply affected by a process of social construction between the main social groups of a socio-economic system. Every new technology is thus a final result of a process of negotiation between these social groups who represent different interests. Rogers (2003) and Bramble *et al.* (2010) argue that successful technological diffusion of innovations is thus a result of a process of mutual adaptation among technology producers, users, and external groups and the system that adopts the innovation.

### 1.1.2 **Process of innovation diffusion**

Diffusion is the process by which an innovation is communicated through specific channels over time among members of a social system that are linked via networks (Rogers, 1995). Thus, innovation diffusion involves the capacity to spread the production and the use of an innovation in practice through the social network structure of a group of stakeholders (Muzzi & Kautz, 2004). For example, King *et al.* (1994) recognize the importance of institutional intervention in the process of innovation diffusion by highlighting the importance of governmental or quasi-governmental institutions as the most powerful institutional forces affecting innovation in the form of deliberate decisions to intervene or to refrain from intervening. According to Rogers, the “tipping point” in the diffusion of a technology is the point at which a trend “catches fire” and spreads exponentially through the population. Crucially, for most members of a social system the decision to adopt an innovation depends heavily on the decisions of others. In standard diffusion theory,

adoption of an innovation speeds up once 10-25% of system members have adopted it.

Successful technological diffusion of innovations is seen as the result of a process of mutual adaptation among technology producers, users, and external groups (Rogers, 1962; Bramble et al, 2010) and the system that adopts the innovation. The interplay of these factors can shape the properties of the new technology, the use of the technology, the organizational context, and the societal context. Other research has considered the relevance of knowledge-sharing in institutional networks. For example, the knowledge-sharing role of professional associations and technology suppliers in diffusion of production and inventory control systems and computer-aided production management systems was elaborated by Swan and Newell (1995) and Swan, Newell and Robertson (2000). Kurnia and Dare (2005) suggest that external parties, such as trade associations, standard-setting bodies and consultancies, play an important role in the diffusion of efficient customer response systems. Their study concludes that external parties can minimize adoption and diffusion barriers by assuming advisory, research, educational, promotional, and facilitating roles.

### **1.1.3 Technology adoption**

Rodgers (1995) argues that adoption of technology can be seen as the cumulative or aggregate result of a series of individual calculations that weigh the incremental benefits of adopting a new technology. He further intones that all firms or individuals who get exposed to technology must make a decision about whether to adopt or reject. This can be done instantaneously or through a process. The decision makers of technology adoption consider relative advantage offered by the technology aspects of compatibility, complexity, trialability and observability.

In deciding whether or not, and when, to adopt a new technology a firm is naturally concerned about uncertainties regarding future market conditions such as consumers' response to the new technology product, competition from rival producers, the cost of initial investment in the new technology, and costs of borrowing capital, hiring labor, and using other inputs. But importantly, it is also concerned about uncertainties surrounding the very process of technical innovation, which is often outside the firm's control (Farzin, Huisman & Kort, 1998).

#### 1.1.4 Stakeholder pressure

Freeman (1984) defined a stakeholder as “any group or individual who can affect or is affected by the achievement of the organization’s objectives”. Varied definitions of stakeholders have resulted in categorization of stakeholders as either “claimants” or “influencers” (Mitchel, Agle & Wood, 1997). Stakeholders have also been categorized as either internal stakeholders; those who are actively involved in implementation of a technology and external stakeholders; those who are affected by the technology (Mathur, Price & Austin, 2008). Internal stakeholders therefore include employees, managers, owners, shareholders and labour unions whereas external stakeholders include community, consumer groups and regulators/government (Hyatt, 2011).

Pearce and Robinson (2010) established that a major constraint in decision making in a firm is the power of environmental elements. Hercleous (2003) specifically mentioned the power of the dominant coalition in an organization in determining the course of strategic action. The dominant coalition can therefore be viewed as a key stakeholder group who greatly influences decisions of a firm. Following Freeman (2004) insights of stakeholder theory, firm’s strategy can be said to be influenced by stakeholder pressure. Jacobs, Witteloostuijn and Christe-Zeyse (2013) opine that if stakeholders recognize that their expectations are not being met, the organization may lose legitimacy in the eyes of key external audiences. This can have serious ramification especially if some stakeholders control vital resources. Stakeholders are known to disagree on the relative importance of innovations and may therefore use their resources to

influence other stakeholders and resort to politics and power to affect implementation processes (Lambooij & Hummel, 2013). The different positions of stakeholders and the associated differences in priorities and interests are likely to affect stages of the implementation process of innovation from the first stage of experiencing and defining a problem to looking for solutions .

Owners as an important group of stakeholders in a firm expect a fair return on their investment. Zakić, Jovanovic and Stamatović (2008) opine that a company will pursue innovation if it expects to benefit from it. Baldwin and Sabourin (2000) also found out that foreign ownership has a relevant influence on process innovation. Multinational companies are therefore more likely to undertake process innovation than domestic ownership. Misoi, Wario and Orwa (2015) found similar results in a study of adoption of technology in tea industry in Kenya which suggested that foreign owned companies are keener on innovation than locally owned companies.

Zakic *et al.* (2008) posit that employees as internal stakeholders are the implementers of the innovation. Process innovations require the presence of people that take part in the process. People in the organization practically know best the existing processes and the way they function. The programs of process innovations therefore insist upon staff participation. Innovations and specifically process innovation have big impact on society. For example, the striking knitters in the Luddite movement in the nineteenth century in Nottingham took to rioting and breaking the new more efficient machines located in factories because they feared that the new machines would destroy their livelihoods (Chapman, 2002).

Customers are another set of stakeholder group. Their needs and expectations also are essential for process innovations. According to McAdam, Hazlett and Casey (2005), discovering the needs of customers therefore is of essence to private enterprises. Orientation of a firm to both existing and potential customers and their satisfaction is very critical. The companies oriented to customers are responsive to final customer

needs, measure their satisfaction level and improve the processes in order to satisfy customers (Slater & Narver, 1998)

Community involvement in decision making is a concept related to ethical business. Individuals and groups who are excluded from the decision making processes are likely not to have their needs and preferences reflected in the outcomes and may bear the negative impacts of the decisions (Innes & Booher, 2004). Jacobs *et al* (2013) argue that a key external threat to success of organizational change is legitimacy erosion which consequently impact on organizational performance. Rodgers (2003) argues that community opinion leaders play a critical role in diffusion of innovation in that they are individuals who influence others' orientation towards adopting an innovation. Adoption of technologies that may be perceived negatively by the community may slowly be adopted or resisted altogether (Schiafone, 2012). Dimmagio and Powell (1983) propounds that a firm may seek to accommodate the views of the society in order to achieve organizational legitimacy in its decisions.

Closely related to the community is the government as a stakeholder. The government main role is regulatory. Regulatory pressures relate to legal mandates to which organizations comply (Oliver, 1991). Failure to comply may lead to non-compliance penalties, revocations of licenses or bad media publicity. Government is influential in ensuring firms adhere to specific standards.

In summary, the above discourse gives credence to suggestion by Pieterse, Caniels and Homan (2012) that it is important to make explicit and implicit definitions, assumptions, beliefs and expectations from groups and professionals involved in change projects as this eliminates any misunderstandings and may most likely guarantee successful implementation of change.

#### **1.1.5 Tea subsector in Kenya**

World tea production has grown by 51 percent over the last 20 years and doubled over the last 3 decades (FAO, 2009). The major tea producing countries are China,

India, Kenya and Sri Lanka at 31, 26, 9 and 8 per cent respectively. Kenya is thus the third largest producer of black tea after China and India. The country's production stood at about 445,000 tons in the year 2013 (RoK, 2015). The tea industry in Kenya is divided into large scale plantation estates and small holder sub-sectors. The former is under control of big multinational companies and account for about 40 per cent of total made tea (TRFK, 2011). The plantation estates are made up of the multinationals and local farmers whose holdings are generally over 50 hectares.

The tea subsector is one of the main drivers of the economic growth in Kenya. It contributes to about 2.5 percent of GDP in Kenya (RoK, 2015). Tea is also the leading foreign exchange earner in Kenya. In 2014, tea earned the country Kshs 85 billion. It accounted for 10 percent of the agriculture and forestry sector contributions to gross domestic product (RoK, 2015). It also provides a means of livelihood to about 10 percent of the population (TBK, 2008), a scenario which is common globally in the tea producing countries such as India, Vietnam and Indonesia which support over 10 million, 400,000 and 350,000 people in the sector respectively (van de Wal, 2008).

Low productivity, cost of production, exchange rate and efficiency issues have however negatively affected the subsector. Also, increasing international competition has had significant impacts on product price and profitability (van de Wal, 2008). Van de Wal further pointed out that labour cost as a percentage of total costs had markedly increased from 43 per cent in 1999 to about 55 percent in 2006. Approximately 75 per cent of the labour cost is attributed to tea harvesting operation which is largely manual. The scenario has been further exasperated by the dissonance between costs of labour and rate of inflation. RoK (2009) showed that in 2007 inflation rate in Kenya stood at about 9.8 per cent whereas wage rate had increased to about 22 per cent at about the same period.

## **1.2 Statement of the problem**

The greatest challenge in the tea subsector as stated in the background of the study is the high labour cost which constitutes about 55 percent of total cost of production out of which 75 percent relates to the manual harvesting of the crop (van de Wal, 2008). RoK (2015) shows that Kenyan tea prices declined by 23% between 2011 and 2014. The high labour cost coupled with declining tea prices as observed by Ongong'a and Ochieng (2013) depicts declining profitability trend. The tea subsector however, has identified innovation as an intervention of taming the declining profitability. This is through adoption of mechanized tea harvesting technology (van de Wal, 2008). The technology which is largely a process innovation is relatively labour efficient. A comparative analysis shows that mechanized tea harvesting technology is approximately 50 percent cheaper compared to the alternative manual tea harvesting (Maina & Kaluli, 2013). The uptake of this technology however, is surprisingly low and stands at 32 percent of the total crop harvested in tea plantation segment (Misoj & Wario, 2014).

Extant literature shows that management decisions in organizations are actually a reflection of stakeholders' interest which at times conflict (Freeman, 2004). New changes in an organization have to be filtered in these groups through discourse and negotiations. If the change does not fit into interests and values of the group, adoption is likely not to be feasible (Schiavone, 2012). Furthermore, the decision to adopt a particular innovation may vary between stakeholders because individual stakeholders may disagree on the costs and benefits involved. This study therefore sought to establish the influence of stakeholder pressure perceptions on innovation in Kenya's tea subsector in the context of adoption of mechanized tea harvesting technology.

## **1.3 Research Objectives**

### **1.3.1 General Objective**

To establish the perceptions of stakeholder pressure on mechanized harvesting technology adoption in the tea subsector in Kenya.

### **1.3.2 Specific objectives**

1. To establish how perception of owners influences mechanized harvesting technology adoption in the tea subsector in Kenya.
2. To determine how perception of employees influences mechanized harvesting technology adoption in the tea subsector in Kenya.
3. To find out how perception of customers influences mechanized harvesting technology adoption in the tea subsector in Kenya.
4. To establish how perception of community influences mechanized harvesting technology adoption in the tea subsector in Kenya.
5. To find out how perception of government influences mechanized harvesting technology adoption in the tea subsector in Kenya.

## **1.4 Research Hypothesis**

1.  $H_0$ : Perception of owners does not influence mechanized harvesting technology adoption in the tea subsector in Kenya.
2.  $H_0$ : Perception of employees does not influence mechanized harvesting technology adoption in the tea subsector in Kenya.
3.  $H_0$ : Perception of customers does not influence mechanized harvesting technology adoption in the tea subsector in Kenya.
4.  $H_0$ : Perception of community does not influence mechanized harvesting technology adoption in the tea subsector in Kenya.

5. H<sub>0</sub>: Perception of government does not influence mechanized harvesting technology adoption in the tea subsector in Kenya.

### **1.5 Justification of the study**

Since tea is a global cash crop and is also a major contributor of economic growth in Kenya, a deeper understanding of how perception of stakeholder pressure affects innovation is important. Moreover, the level of innovation in the subsector is low and the study is expected to provide an in depth understanding of the specific drivers of mechanized tea harvesting technology in the subsector thus enabling more successful diffusion of the innovation. Jacobs *et al.* (2013) further argue that the speed of implementation of change drives the opportunity costs of organizational change. Slow diffusion of innovation therefore implies that potential benefits of technology may be hampered unnecessarily. In seeking to explore the perceptions of stakeholder pressure on mechanized harvesting technology adoption in the tea sub sector in Kenya, the study hopes to make firms better understand why the diffusion of possibly efficient innovations progresses slowly than expected thus assisting the firms to put in place appropriate interventions. The study is also expected to empirically firm up the theoretical understanding of role of stake holders in decision making and to therefore contribute to development of linkage between stakeholder's theory and decision making.

### **1.6 Significance of the study**

The study is of great importance to the scholars as it is expected to firm up through empirical testing the linkages that exist between stakeholder's theory and decision making in organizations. Moreover, extant literature on role of stakeholder pressure on innovation covers areas of new product development, radical and disruptive innovation (Salomo, Steinhoff & Trommsdorf, 2003; Zerenler, 2008; Han *et al.*, 1998; Govindarajan, Kopalle & Danneels, 2011) and environmental practices (Hall & Wagner, 2011; Sharma & Henriques, 2005; Henriques & Sadorsky, 1996). None

however has delved into process innovation thus making this study relevant in providing a new empirical link in the area of stakeholder and process innovation.

The study findings are of great importance to the various stakeholder groups in the business spheres such as management, owners and the policy makers. It is envisaged that management in tea industry will benefit from the study through a greater understanding of various challenges faced by the tea industry players in Kenya who are seeking to adopt the technology. The owners on the hand are expected to have a clear understanding of other voices within and without the organization and gauge how they can negotiate in their quest to have high returns on investments. The study will also be of great importance to the policy makers especially the government or regulatory bodies as it will bring into light various interests of other players in the tea industry with regard developing policy on innovation regarding mechanized tea harvesting technology hence ensuring competitiveness of the sector in the global arena.

### **1.7 Scope of the study**

The study focused on the Perceptions of Stakeholder Pressure on mechanized harvesting technology adoption in the tea subsector in Kenya. This involved all plantation tea estates in Kenya because of their potential to adopt mechanized tea harvesting technology. The status of a firm's adoption of the mechanized tea harvesting technology was a cross sectional snapshot. The stakeholder pressure composed of five types of stakeholder pressures stemming from five generic stakeholder groups as defined by Freeman (1984) namely owners, employees, customers, community and government but as applied to the tea subsector in Kenya. First, the five types of pressures were as perceived by managers in charge of the tea plantation firms and were measured using a five point perception likert scale

The statements or questions in the scale sought to capture power, legitimacy and urgency attributes of each stakeholder group in so far as innovation and specifically

the adoption of mechanized tea harvesting technology is concerned. The cumulative score of all attributes is expected to form a measure of stakeholder pressure as used by Agle, Wood and Sonnenfield (1999). Other than perception, stakeholder pressure was captured in the following ways. Owners pressure was defined on the basis of firm ownership type in particular, whether locally owned or foreign owned; employee pressure was quantitatively captured as proportion of employees who are unionized, customer pressure was captured by the proportion of direct customers demanding certified products, community pressure was captured by population proximate to the tea firm and also by the number of job request from the surrounding community; the government pressure was captured by the number of inspections on firms operations and compliance rating. The research therefore was narrowed to activities within the scope of the issues addressed by the research objectives.

### **1.8 Limitations of the Study**

The main limitation of the study was the delay in returning of the questionnaires. Though the numbers of plantation estates are few, they are spread over the country. The delivery and collecting back of the questionnaires was not an easy task. The data was collected at the time that most of firms were preparing their financial statements and therefore resulting in some delays in dispatch back. To mitigate against this, firms were politely reminded through follow up calls.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter reviews relevant literature on the perceptions of stakeholder pressure on mechanized harvesting technology adoption in the tea sub sector in Kenya. The chapter reviews the theories, conceptual framework and empirical work that were used in the study in regard to each variable. The review identifies research gaps and demonstrated the empirical justification for this study.

#### **2.2 Theoretical review**

The research was based on two overarching theories for the main independent variable of stakeholder pressure perception; the attribution theory as the basis of management perception and the stakeholder theory as the basis of stakeholder pressure. These theories were supplemented by resource dependency theory, change management theory as well as institutional theory to provide linkages of the specific components of stakeholder pressure to the dependent variable of innovation. The theory underpinning the dependent variable of technology adoption was the technology adoption theory.

##### **2.1.1. Attribution Theory**

The attribution theory is the basis of perception and explains that people interpret behaviour in terms of its causes and that these interpretations play an important role in determining reactions to the behaviour. It further points out that antecedents of attributions are prior information, the individual set of beliefs and motivation (Kelley & Michela, 1980). The attribution is affected by information about the consequences of the action as these are compared with the consequences of other actions. Secondly, the attribution is affected by the perceiver's beliefs about what others would do in the

same situation. Thirdly, attribution has to do with motivation. If the action affects the perceiver's welfare, there is a greater likelihood a disposition will be inferred from it. This occurs because the impact on the perceiver's welfare becomes a focal effect to which the other effects are assimilated. The perceiver's motivation is believed to affect the processing of information about action.

Zalkind and Costello (as cited in Harrison, 1975) suggests that perceptual process comprises of three elements namely; selectivity, which involves the separation of information for further consideration, closure, which comprises compilation of pieces of information into a meaningful whole and interpretation which is the use of previous experience, beliefs and motivation as aids in judging the information previously collected. Child (1972) suggests that perceptions are responsible for the choices which managers make in fitting the organization and its environment. Following Child's argument, it can be deduced that the way management perceive stakeholder pressure therefore can determine the choices of management with regard to innovation.

### **2.1.2. Stakeholder Theory**

Stakeholder theory can be traced back to the seminal work of Freeman (1984) who articulated a new conceptual model of the firm that must address the interests of its groups and individuals who can affect or are affected by the organization's purpose (Ayuso, Angel, Roberto, Miguel & Ariño, 2011). The stakeholder theory can be understood from three perspectives. First, the theory is descriptive in that it is used to describe and explain specific corporate characteristics and behaviours including the nature of the firm, the way managers think about managing, how board members think about the interests of corporate constituencies (Wang & Dewhirst, 1992) and how some corporations are actually managed (Clarkson, 1991). This view stems from earlier works of Cyert and March (1963) which viewed the firm as a shifting multi goal coalition. Secondly, the theory can be used to identify the connections, or lack of connections between stakeholder management and achievement of corporate

objectives, this is the instrumental aspect of stakeholder theory (Donaldson & Preston, 1995). Finally the theory can be used to interpret the function of the corporation including the identification of moral guidelines for operation and management of corporations. This aspect is referred to as normative aspect of the stakeholder theory and concerns itself with legitimacy of corporations. The instrumental power and normative validity aspects of stakeholder theory therefore are critical in developing the linkage between stakeholder pressure and innovation of a firm in the context of mechanized harvesting technology.

The stakeholder theory closely relates to the behavioral theory of the firm which attempts to explain the process of decision making in the modern firm and Aoki's cooperative game theory of the firm (Aoki,1986) which attempts to explain internal governance and specifically the balance between owners' and employees' interests. Stakeholder theory therefore can be understood to be a model that seeks to describe what a corporation is, a framework for examining linkages between practice of stakeholder management practice and performance and stakeholders as persons or groups with legitimate interests which are of intricate value (Donaldson & Preston, 1995). Stakeholder theory therefore views a corporation as an organizational entity through which numerous and diverse participants accomplish multiple and not entirely congruent purposes. Since the conflicting interests have to be managed, it follows therefore that the key attribute of stakeholder management as envisaged in stakeholder theory is the attention to legitimate interests of appropriate stakeholders in decision making.

The theoretical backbone of this study thus hinges on stakeholder theory. The study seeks to borrow from Freeman (1984) generic stakeholder groups model and as applied by Agle *et al.* (1999). This includes shareholders, employees, customers, community and government bodies as groups who have interests in the firm and that the interests may conflict in the process of adoption of technology in the tea subsector in Kenya thus affecting the uptake of the technology. The basis of stakeholder group identification and prioritization is the stakeholder core attributes of power, urgency

and legitimacy as posited by Mitchel, Agle and Wood (1997). Mitchel *et al* (1997) defines power as the stakeholder's ability to influence the firm's behaviour whether or not it has a legitimate claim, whereas legitimacy of a claim on a firm is based upon contract, exchange, legal title, legal right, moral right, at risk status or moral interest in the harms and benefits generated by company actions. The attribute of urgency on the other hand is the degree to which a stakeholder's claim calls for immediate action. The study sought to embed perception of stakeholder pressure as a determinant of innovation in a firm.

### **2.1.3. Resource Dependency Theory**

Pfeffer and Salancik (1978) developed resource dependence theory which is based on the notion that environments are the source of scarce resources and organizations are dependent on these finite resources for survival. Pfeffer and Salancik argued that organizations are coalitions of varying interests and are "other directed" or controlled by those who control critical resources. Pfeffer and Salancik suggested three factors that influence the level of dependence organizations and impacts it had on particular resources. First, the overall importance of the resource to the firm was critical in determining the resource dependence of the firm. Second, the scarcity of the resource was also a factor. The scarcer a resource, the more dependent the firm became. Finally, another factor influencing resource dependence was the competition between organizations for control of that resource. The domination of a visual field therefore will likely be associated with critical resources. This is because power accrues to a group or coalition with access to such resources.

Agle *et al.* (1999) posited that the attribute of stakeholder power contributes to domination of the visual field by the stakeholder group, a view supported by Fiske and Taylor (1984) who opined that people attend more to those who determine their outcomes. Newcombe (2003) suggested that power is the mechanism through which stakeholders influence the direction and decisions for a project. This power can be used to retain the status quo or to enforce fundamental change. Gaining approval or

implementing successful change is largely dependent on who has the control of resources. Whereas the stakeholder theory therefore seeks to answer the question of who are the stakeholders and what are their demands, Frooman (1999) merged the stakeholder theory and resource dependency theory in order to respond to a pertinent issue of how the stakeholders will go about getting these demands. This question concerns their means of achieving their claims.

The application of resource dependence theory by Frooman was based on the proposition that the types of influence strategies that stakeholders apply can be understood in terms of resources and that a determinant of the choice of strategies will be the type of resource relationship the firm and stakeholder have and where the balance of power lies within that relationship. This study wishes therefore to rely on Frooman (1999) argument in establishing the link between stakeholder pressures on innovation decision. The pressure of stakeholders will depend on resources they hold and that resource dimension of a relationship is critical because power stems from it. It can be argued that since owners or shareholders of the organization control resources, there is bound to be a high likelihood that they would approve actions that will benefit them more. This conception therefore prompted the first research hypothesis.

In the same vein, managers throughout the organization are also expected to understand that their success is tied to customer demand. Managers' careers thrive when customer demand expands. Thus customers are therefore the ultimate resource on which companies depend. Although this seems obvious in terms of revenue, it is actually organizational incentives that make management see customers as a resource. The view of customers as a resource that organization depends upon therefore instigated the third research hypothesis.

#### **2.1.4. Change Management Theory**

Human beings have a set of needs that must be satisfied. If change threatens these needs, cooperation in the change process will not be expected. Innovation and specifically adoption of a new technology is a change process and Kotter's change management model thus find relevance and forms the theoretical basis of this study. Kotter's fifth step of change management calls for removing obstacles and empowering people to move forward. Structurally, this is a matter of identifying rules, roles, procedures and patterns that block progress of change and then working to realign them (Bolman & Deal, 2008). The perspective of resistance to change is overly anthropocentric (Langstrand & Elg, 2012). Robbins and Judge as cited in Alasari and Askary (2014) posit that individual sources of resistance reside in basic human characteristics such as perceptions, personalities and needs.

When change recipients therefore perceive that the proposed change is threatening the needs in their hierarchy of needs, it evokes fear and these results in resistance of the change. Rosenberg and Mosga (2011) list attitude toward change, fear of the unknown, cognition, fear of failure, perceived loss of security and status as some of human actors that can lead to resistance to change. Jacobs *et al.* (2013) posits that shared expectations between organization and its employees can successfully influence and sometimes even orient organizations. The import of the change management theory thus prompted the second research hypothesis.

#### **2.1.5. Institutional Theory**

Institutional theory emphasizes the role of social and cultural pressures imposed on organizations and which influence organizational practices and structures (Scott, 1995). Scott asserts that institutions are social structures that have attained a high degree of resilience. The institutional theory focuses on the deeper and more resilient aspects of social structure. It considers the processes by which structures become established as authoritative guidelines for social behavior. Verbeke & Tung (2012)

state that the institutional theory perspective proposes that individuals tend to be approval-seeking, susceptible to social influence, and habituated to tradition and societal expectations

DiMaggio and Powell (1983) argue that managerial decisions are strongly influenced by three institutional mechanisms coercive, mimetic and normative isomorphism that create and diffuse a common set of values, norms and rules to produce similar practices and structures across organizations that share a common organizational field. DiMaggio and Powell argue that in order to survive, organizations must conform to the rules and belief systems prevailing in the environment, a process referred to as institutional isomorphism so as to earn legitimacy and the net effect of institutional pressures is to increase the homogeneity of organizational structures in an institutional environment. Coercive pressures come from legal mandates or influence from organizations they are dependent upon. Mimetic pressures stem from the need to copy successful forms. This tends to arise during periods of high uncertainty. Finally, normative pressures refer to homogeneity which comes from the similar attitudes and approaches of professional groups and associations brought into the firm through hiring practices. The pertinent question is could the firm in seeking to be legitimate pursue or fail to pursue innovation? The above discourse therefore motivated the fourth and fifth research hypotheses.

#### **2.1.6. Technology Adoption Theory**

Adoption theory examines the individual and the choices an individual makes to accept or reject a particular innovation. In some models, adoption is not only the choice to accept an innovation but also the extent to which that innovation is integrated into the appropriate context (Straub, 2009). Straub further contends that adoption theory is a micro-perspective on change, focusing not on the whole but rather the pieces that make up the whole. Historically, adoption is understood in terms of some kind of behavior change. The theory emanates from innovation decision process theory (Rogers, 1995) which states that diffusion is a process that occurs over

time and can be seen as having five distinct stages. The stages in the process are knowledge, persuasion, decision, implementation and confirmation. According to this theory, potential adopters of an innovation must learn about the innovation, be persuaded as to the merits of the innovation, decide to adopt, implement the innovation and confirm the decision to adopt the innovation.

The results of adoption theory are measured in terms of behavioral change; the predictors of that behavioral change can be understood through contextual, cognitive and effectual factors. Since perceptions are cognitive in nature, it can therefore be argued that management perceptions of the stakeholder pressures are potential predictors of the behavioral change which in effect is the adoption or rejection of a technology.

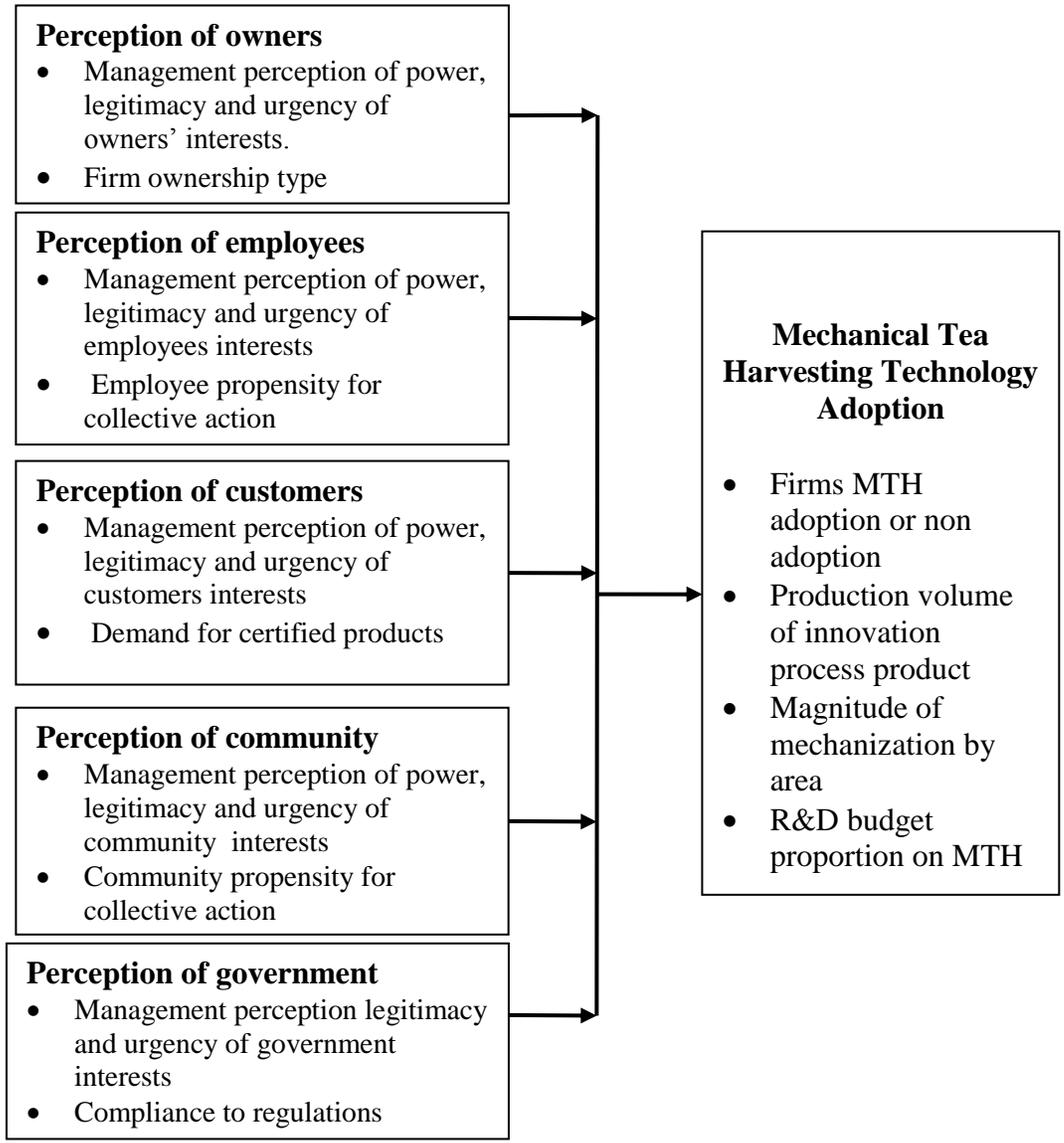
## **2.1 Conceptual Framework**

Arising from the theoretical review, the researcher therefore conceptualized the conceptual model presented diagrammatically in Figure 2.1

**Independent Variables:**

**Dependent Variable**

**Stakeholder Pressure Perception**



**Figure 2.1: Conceptual Framework**

## 2.3 Empirical Review

### 2.3.1 Stakeholder pressure

According to Freeman (1984) stakeholders are any group or individual who can affect or is affected by the achievement of the firm's objectives. They may be either primary; those that have a direct impact on the firm or secondary; those that are not directly involved with the firm but may indirectly influence the firm via primary stakeholders. Varied definitions of stakeholders however have resulted in categorization of stakeholders as either "claimants" or "influencers" (Mitchel *et al.*, 1997). Clarkson (1995) argues that stakeholders have different 'interests, claims or rights' and therefore narrows Freeman's primary and secondary stakeholder definition by arguing that the former are those that the corporation needs to survive, such as investors, employees, customers, suppliers, governments and communities that provide infrastructures and markets. Stakeholders have also been categorized as either internal stakeholders; those who are actively involved in implementation of a technology and external stakeholders; those who affected by the technology (Mathur *et al.*, 2008). Internal stakeholders therefore include employees, managers, owners, and shareholders whereas external stakeholders include community, consumer groups and regulators/government (Hyatt, 2011).

A key issue facing stakeholder management is the identification of which stakeholders are most important. Mitchell, Agle and Wood (1997) argue that salient stakeholders are those that possess power ; the ability of one entity to influence another, legitimacy ; socially accepted and expected behaviour and urgency ; the degree to which an issue is regarded as important or time sensitive. It is important to carry out stakeholder analysis especially in technology development as there is a variance in interests and perspectives among stakeholders. Jacobs *et al.* (2013) opine that if stakeholders recognize that their interests are not being met, the

organization may lose legitimacy in the eyes of key external audiences. This can have serious ramifications especially if some stakeholders control vital resources.

Recent empirical studies have demonstrated how the influence of external stakeholders on a firm's strategies has dramatically increased. Delmas and Toffel (2008) established that organizational environmental responses vary with stakeholder groups and Sharma and Henriques (2005) observed that different stakeholder pressures affect firm's environmental practices. Earlier work by Dill (1975) and Freeman and Reed (1983) looked at the ability of stakeholders to influence the organization in terms of the nature of their claims and source of their power. Mitchell *et al.* (1997) later identified urgency, power, and legitimacy as factors that determine how management prioritizes various stakeholders. Frooman (1999) applied resource dependence theory to identify types of stakeholder influence strategies which included withholding, usage, direct and indirect strategies. Murillo-Luna, Garcés-Ayerbe and Rivera-Torres (2008) also provided empirical evidence regarding the ability of stakeholders to influence firm decisions.

Stakeholders are known to disagree on the relative importance of innovations and may therefore use their resources to influence other stakeholders and resort to politics and power to affect implementation processes (Lambooi & Hummel, 2013). Hall and Vredenburg (2003) distinguishes between stakeholders within the innovation value added chain and those that are not. They argue that innovation value added chain stakeholders have similar interests, claims and rights, whereas those outside of the innovation value-added chain are often motivated by different values and objectives. The different positions of stakeholders and the associated differences in priorities and interests are likely to affect stages of the implementation process of innovation from the first stage of experiencing and defining a problem to looking for solutions.

Operationalization of the stakeholder group variables in this study were done qualitatively and quantitatively. Quantitative operationalization was through

measurement of management perception of the stakeholder group pressure which is an accumulation of stakeholder attributes of power, legitimacy and urgency as developed by Mitchell *et al.* (1997). Henriques and Sadorsky (1996) suggested that the perception of stakeholder pressure can be evaluated through a perception instrument. This has been applied successfully in past studies (Agle *et al.*, 1999; Hall & Wagner, 2011; Ayuso *et al.*, 2011; Murillo-Luna *et al.*, 2008). Quantitative operationalization was done as explained under each stakeholder group variable.

### **2.3.2 Perception of owners**

According to Jensen (2000), a vocal champion of the shareholder wealth maximization, wealth maximization does not mean that firms should completely neglect stakeholders. However, Jensen warns against allowing managers too much discretion with regard to allocating resources to satisfy a broad group of stakeholders. His admonition stems from a mistrust of managers and their propensity to allocate resources according to their own desires at the expense of efficiency. He also argues that shareholders should be given the most importance in managerial decisions because they are the only constituency of the corporation with a long-term interest in its survival. The argument can be easily criticized as shareholders can easily sell their stock at any time and reinvest in another company. Employees on the other hand would find it relatively more difficult to change employers, customers could lose an essential source of supply, and certainly local communities are hurt if an organization ceases to exist.

Owners as an important group of stakeholders in a firm expect a fair return on their investment. Zakić *et al.* (2008) in their review of external and internal factors affecting the product and business process innovation, opine that a company will pursue innovation if it expects to benefit from it. Ndah, Schuler, Uthes and Zander (2010) in their overview of adoption modeling approaches assert that social system or culture therefore can inhibit or drive adoption. Organization's culture depends on the founders or owners of the organization. Brown, Earle, Vakhitova and Zheka (2010) in

a study on innovation, adoption, ownership, and productivity in Ukraine in which they used Tobit regressions pointed out that despite extensive research on how firm performance varies with ownership types and corporate governance having been done, the channels through which some owners and institutions produce superior performance is quite limited. Brown *et al.* (2010) further argue that some owners and governance arrangements may better facilitate investment choices or implementation, resulting in higher levels of investment or higher returns and hence superior performance. Furthermore, owners can facilitate organizational change and provide trained managers.

Crespi, Criscuolo and Haskel (2007) have shown that in the private sector, foreign owners could monitor management more effectively through better corporate governance structures. Foreign owners could also have more experience using high technology and organizational practices that best suit it. New firms can upon entry put in place structures for new technology, giving them an advantage over established firms that would have to undertake potentially painful restructuring. Investor influence on firm's environmental practice has been recognized (Bansal & Roth, 2000). Brown *et al.* (2010) established that firm types may also vary in access to finance. Firms with better access can invest more. Foreign owners are likely to have better access to financing for investment than local or domestic private firms. Baldwin and Sabourin (2000) in their detailed study of the factors that contribute to innovational activities in Canadian food industry found out that foreign ownership has a relevant influence on process innovation. Misoi *et al.* (2015) in a study of influence of firm ownership type on adoption of mechanized tea harvesting technology in the tea subsector Kenya established that foreign owned firms were more likely to adopt the technology than local owned firms thus indicating that owners do play a role in innovation.

### 2.3.3 Perception of employees

Ayuso *et al.* (2011) observe that attention of most literature on innovation and its management is given to human resource management (HRM) issues, such as recruitment and selection, training and development, feedback, reward and recognition of employees. A firm's ability to produce new products and services is inextricably linked to how it organizes the engagement with its main internal stakeholder; the employee. Zakić *et al.* (2008) argue that employees as internal stakeholders are the implementers of the innovation. Russo and Perrini (2010) suggest that cultivation of close relationships with workers and the social or business environment makes it possible to establish expectations in social relationships. Since employees play an integral role in shaping work practices in firms they also look for signals that management listen to their concerns.

Subramaniam and Youndt (2005) in the longitudinal study examined how aspects of intellectual capital which consists of human capital, organizational capital and social capital influenced various innovative capabilities (incremental and radical) in companies. Subramaniam and Youndt studied 93 companies in various industries, they found that human capital influence incremental and radical innovative capabilities. Human capital interacted with social capital and to positively influence radical innovative capability. Human capital itself was negatively associated with radical innovative capability. Wu *et al.* (2008) while attempting to explore the mediating effect of human capital on innovation in Taiwanese manufacture and non-manufacture industries established that human capital and customer capital had a perfect mediating effect on innovation. In the study of Turkish automotive supplier industry, Zerenler (2008) found contradicting results that employee capital had significantly positive relationships with innovation performance.

Kim, MacDuffies and Pil (2010) in a study to examine the effects of team and representative voice on manufacturing performance in a sample of 79 plants established that workers use union voice mechanisms to present their concerns. Kim,

MacDuffies and Pil argued that in employment context, union voice is the mechanism whereby workers work within the system using direct communication to bring about internal change that yields desired conditions. Freeman and Medoff (1984) argued that for worker voice to be effective in influencing managerial behavior toward employees, it must be collective voice. Without collective voice through the agency of worker representation, employees lack the incentive to pursue public goods, such as enhanced working conditions and workplace policies that affect the wellbeing of all employees. Union presence may however lower labour productivity via restrictive work practices or lower firm investments due to lower firm profitability. Likewise, union voice may be associated with adversarial industrial relations, preventing the efficient flow of information between workers and management and not fully capturing the heterogeneity of input which workers may provide (Bryson, 2004). The strength of employee influence through union is best demonstrated in the auto industry as shown by Hunter, MacDuffie and Doucet (2002) where corporate decisions about capital investments in a given factory are often contingent on union acceptance of productivity improving initiatives. The fear has been that that strong worker representation may lead to employee gains at the expense of organizational performance.

Organizational changes can imply certain risks. Technological changes may mean staff reduction is inevitable. Quite often, automation of work causes redundancies. In such conditions, the reaction of employees is resistance. For example, Chapman (2002) observed that the striking knitters in the Luddite movement in the nineteenth century in Nottingham took to rioting and breaking the new more efficient machines located in factories because they feared that the new machines would destroy their livelihoods. Hill and Jones (1992) however, have explained that whereas change at one point in time may favour managers, change in a subsequent period may shift the balance of power towards other stakeholder groups. If unions or worker representatives have strong influence on a wide range of strategic, technological, and work issues, as demonstrated by Hunter *et al.* (2002), they are more likely to provide valuable input.

### **2.3.4 Perception of customers**

Due to fierce competition in the marketplace, globalization and an explosion of technology in recent years, businesses need to place customer orientation at the heart of the firm's competitiveness (Deshpande, Farley & Webster, 1993). According to McAdam *et al.* (2005), discovering the needs of customers therefore is of essence to private enterprises. Orientation of a firm to both existing and potential customers and their satisfaction is very critical. Verbeke and Tung (2012) however argue that a firm focused on current revenue stream is likely to be more customer salient than one that is targeting a potential revenue stream. Pirsch, Gupta and Grau (2007) opine that customers consciously and actively search for goods that provide them with the rewards or experiences they seek. They reward firms that fulfill their needs with loyalty, purchase intent, positive attitude and also demonstrate minimized skepticism if they feel that a firm has considered a number of moral and ethical consequences of its actions. The companies oriented to customers are therefore responsive to final customer needs, measure their satisfaction level and improve the processes in order to satisfy customers (Slater & Narver, 1998)

A critical view of importance of meeting customer demands however has been put forward despite the so obvious fact that firms would benefit from doing their best to serve their customers since customers are necessary to sustain the company's current business. Hamel and Prahalad (1991) as cited in Govindarajan, Kopalle and Danneels (2011) used the phrase "the tyranny of the served market" to refer to the harmful effect of eagerness to serve current customers. Same sentiments were echoed by Slater and Narver (1998). The criticism of customer orientation has been targeted at its alleged effect on innovation in that getting close to customers detracts from true innovativeness and limits organizations ability to incrementally develop new products. Day (1999) pointed out that the concern about becoming more market-driven arises from the fear that undue attention may be given to current markets resulting in failure to notice the emerging markets. The work conducted by Christensen and colleagues (Christensen, 1997; Christensen and Bower, 1996) has

been very influential in this thinking. They found that firms only pursued new technologies that addressed the needs of their current customers.

Salomo *et al.* (2003) provide strong evidence that customer orientation in innovation projects has a positive influence on new product development success. Zerenler (2008) on the same study on Turkish auto-industry established that customer capital was the greatest in influencing innovation performance. Han *et al.* (1998) show that customer orientation, coupled with competition and inter functional coordination, impact on innovation. Govindarajan, Kopalle and Danneels (2011) also established that mainstream customer orientation has a positive impact on the introduction of radical innovations but a negative impact on disruptive innovation, while emerging customer orientation has a positive effect on disruptive innovation and is unrelated to radical innovations. A survey of the largest Canadian firms showed that customer pressure was the second most cited source of pressure to adopt an environmental management plan after government pressure (Henriques & Sadosky, 1996).

### **2.3.5 Perception of community**

According to institutional theory, organizations are driven to incorporate the practices and procedures defined by prevailing rationalized concepts of organizational work and institutionalized in the society. Organizations that do so therefore increase their legitimacy and their survival prospects. This has directed attention to external influences not linked to actual production process such as the passage of legislation and the development of strong social norms within an organization. Community represents actors from the general public outside the immediate economic realm of the corporation and outside the public sector. Civil society organizations include a plethora of pressure groups, non- governmental organizations, charities and religious groups (Crane & Matten, 2004). The communities provide the infrastructure, impose local regulations and levy taxes. In reality they represent the local component of the state, with a predominantly stake watcher role. Community involvement in decision making is a concept related to ethical business. Individuals and groups who are

excluded from the decision making processes are likely not to have their needs and preferences reflected in the outcomes and may bear the negative impacts of the decisions (Innes & Booher, 2004). Jacobs *et al.* (2013) argue that a key external threat to success of organizational change is legitimacy erosion which consequently impact on organizational performance.

Rodgers (2003) argues that community opinion leaders play a critical role in diffusion of innovation in that they are individuals who influence others' orientation towards adopting an innovation. Adoption of technologies that may be perceived negatively by the community may slowly be adopted or resisted altogether (Schiavone, 2012). DiMaggio and Powell (1983) propounds that a firm may seek to accommodate the views of the society in order to achieve organizational legitimacy in its decisions. Innovative structures therefore that seek to improve technical efficiency in early adopting organizations are legitimized in the environment. Related studies on green innovation by Hall and Wagner (2011) and Sharma and Henriques (2005) found evidence that pressure from community stakeholders is distinguished as a determinant factor for innovation decision. The desire to improve or maintain relations with their communities also push firms to adopt innovations. Henriques and Sadorsky (1996) surveyed 700 firms in 1992 and found that community group pressure influenced them to adopt an environmental plan.

### **2.3.6 Perception of government**

Governments tend to be the major generic stakeholder. The government as a stakeholder represents the citizens' interests, the general public, society as a whole, the interests of the wider world and the environment. It operates through official control and regulation and works through courts, regulatory agencies, certification organizations, independent evaluation bodies and laboratories (Fassin, 2009). Fassin describes the government more specifically as a stake-keeper since they have more than influence and exert a coercive power through laws, norms and codes, and control mechanisms. The government, for instance, as a generic stake-keeper, has general

laws applicable to all companies, but also has specific laws for each sector. They have no stake in the firm but have influence and control. They impose regulations and constraints, while the firm has little reciprocal direct impact on them.

Regulatory pressure relate to legal mandates to which organizations comply (Oliver, 1991). Statutes allow firms to take into account the interests of a variety of stakeholders in carrying out their fiduciary duties to the corporation (Flammer & Kacperczyk, 2014). The regulations suggest that a corporation should, or at least may, be run in the interests of more groups than just shareholders. Under these regulations, corporation management are allowed to consider the interests of employees, customers, suppliers, the environment, the local community and any other potentially affected constituency. Flammer and Kacperczyk (2014) posited that absence of stakeholder statutes make corporate leaders not consider stakeholders' interests because their fiduciary duties required them to act in accordance with shareholders' interests.

The presence of government regulations therefore provides corporate leaders with a mechanism for considering stakeholder interests without breaching their fiduciary obligations to shareholders. Moreover, failure to comply may lead to non compliance penalties, revocations of licenses or bad media publicity. Local government's role in driving innovation in the tea subsector is very critical. Their role here is in terms of implementation of policy and regulations set for the tea industry. Government can therefore facilitate adoption by reducing information and search costs linked to the adoption of the technology by providing technical assistance to potential adopters. Flammer and Kacperczyk (2014) in their study of the impact of stakeholder orientation on innovation which focused on effect of government regulation established that enactment of government laws has a stronger impact on innovation. This was particularly evident in industries with weaker job security ; industries with weaker union power and higher employee turnover, firms with weaker employee satisfaction, customer focused industries and less eco-friendly industries with greater

stakeholder dissatisfaction. Nameroff *et al.* (2004); Horbach (2008) and Kemmerer, (2009) also revealed that regulations play a key role in green production innovation.

### **2.3.7 Technology adoption in the tea subsector in Kenya**

Adoption of technology can be seen as the cumulative or aggregate result of a series of individual calculations that weigh the incremental benefits of adopting a new technology (Rogers, 2003). Crossan and Apaydin (2010) provide a comprehensive definition of innovation as the production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres. Adoption of a technology is therefore viewed as a form of innovation. Crossan and Apaydin further view innovation as the renewal and enlargement of products, services and markets, development of new methods of production and establishment of new management systems. OECD (2005) defines innovation as the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations. In both cases innovation is viewed as a process and an outcome.

Empirical studies demonstrate that innovative firms show higher profits, higher market value, better credit ratings, higher market share, and higher probabilities of survival in the market (Foss, Laursen & Pedersen, 2011). The ultimate reason for innovation in an organization therefore is to make profit. The contribution of new technology to economic growth can only be realized when and if the new technology is widely diffused and used. Diffusion itself results from a series of individual decisions to begin using the new technology, decisions which are often the result of a comparison of the uncertain benefits of the new invention with the uncertain costs of adopting. Rodgers (2003) argued that all firms or individuals who get exposed to technology must make a decision about whether to adopt or reject. This can be one instantaneously or through a process.

This study looks at process mechanized harvesting technology adoption in the tea subsector in Kenya and specifically the adoption of mechanized tea harvesting technology and how it may be related with stakeholder pressure. Harvesting of tea involves the removal of the tender, growing shoots from the surface of the tea bush. For a long time tea harvesting has been carried out by hand but in the recent years most tea producing countries including India, Japan, China, Papua New Guinea and Kenya have adopted the use of machines. A comparative analysis shows that mechanized tea harvesting technology is approximately 50 percent cheaper compared to the alternative manual tea harvesting (Maina & Kaluli, 2013). The uptake of this innovation is low and stands at 32 percent of the total crop harvested in tea plantation segment (Misoi & Wario, 2014).

#### **2.4 Critique of the literature**

The foregoing review has provided evidence of attempts to link different stakeholder groups to some form of innovation. The study by Brown *et.al* (2010) in using the Tobit regression to link innovation with ownership types failed to clearly show the means by which these organizations and the owners can achieve superior performance. A study by Baldwin and Sabourin (2000) in a Canadian food industry which bear some similarity to the tea industry, found that foreign ownership influence process innovation. It did not however explicitly indicate the nature of this influence. A similar finding by Misoi *et al.* (2015) only indicated the likelihood of foreign owned firms adopting the technology than locally owned firms but failed to empirically indicate what pushed those firms to adopt the technology.

The longitudinal study by Subramaniam and Youndt (2005) which examined how aspects of intellectual capital which consists of human capital, organizational capital and social capital influenced various innovative capabilities in 93 companies in various industries provided clear evidence on the nature of human capital influence on incremental and radical innovative capabilities. The study however was generalized yet there is bound to be some nuances between industries that an

indiscriminate study may not bring to the fore. A study by Wu *et al.* (2008) was also a generalized study and was expected to similarly overlook differences existing between industries.

The studies on customer stakeholder group indicate that customer orientation influence firm's innovativeness. For example, Salomo *et al.* (2003) provide strong evidence that customer orientation in innovation projects has a positive influence on new product development success, therefore focusing on product innovation. Han *et al.* (1998) show that customer orientation, affect innovation. Govindarajan *et al.* (2011) also found detailed relationships between different types of customer orientation and innovation. They established that mainstream customer orientation positively influence the introduction of radical innovations but a negative impact on disruptive innovation, while emerging customer orientation has a positive effect on disruptive innovation and is unrelated to radical innovations. All the findings however do not explicitly discuss the antecedents of these customer orientations.

Most studies linking community pressure and innovation adoption focused a different set of innovation from the technology adoption. The study by Henriques and Sardosky (1996) furthermore took a generalized study on 700 firms across several industries. This study there overlooked the idiosyncrasy existing within a specific industry. Flammer and Kacperczyk (2014) in their study which focused on effect of government regulation on innovation established that enactment of government laws has a stronger impact on innovation. The study was still done across several industries which again overlooked the industry variations.

## **2.5 Research gap**

The evidence from the critical empirical review shows that research in the area of stakeholder pressure on innovation has been done, however, studies on process innovation form and specifically, on the area of mechanized tea harvesting technology adoption is limited. Most studies have focused on influence of stakeholder

pressure on environmental strategies such as going green adoption and other similar environmental practices. Also, focus has been on the effect of stakeholder pressure on other categories of innovation such as product and radical innovations. This study therefore intends to fill this glaring gap in literature by studying the relationship of the identified independent variables of the stakeholder pressure and mechanized harvesting technology adoption in the tea subsector in Kenya which is a typical case of process innovation. This study is expected to add value to existing literature by providing empirical evidence of the Perceptions of Stakeholder Pressure on process innovation and therefore fill the present conceptual and contextual gaps.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter describes the methodology that was used in undertaking the study. It starts by explaining the research philosophy and design that was adopted. Based on the conceptual framework and variables developed in Chapter two, this chapter covers the research methodology used to test the variables. The chapter addresses issues related to research design, the population, the type of data to be collected, census enquiry, data collection instrument, data collection procedure, pilot test, validity and reliability tests of the instrument used and the how the data analysis was carried out.

#### **3.2 Research philosophy**

Research philosophy is the development of knowledge. The nature of that knowledge is based on assumptions about ones views of the world which then influences the way research will be conducted (Saunders, Lewis & Thornhill, 2006). Initially, two philosophical approaches have been identified; the naturalistic or interpretivist and positivist paradigm (Mugenda and Mugenda, 2003). Positivist paradigm is based on objective reality. The reality can be fragmented into various components which yield independent and dependent variables. According to positivism philosophy, reality is stable, observable and can be measured. Knowledge is obtained using the scientific method which is objective and measurable. Positivism has no value judgments, only statements which can be tested scientifically. To prove the validity of a statement, data must be collected using methods that are agreed on by the scientific community.

A third philosophical approach however is beginning to emerge. This is referred to as mixed research. Mixed methods research is formally defined here as the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study (Johnson & Onwuegbuzie, 2004). Johnson and Onwuegbuzie further argue that mixed research is philosophically, is the “third wave” or third research movement, a movement that moves past the paradigm wars by offering a logical and practical alternative. Philosophically, mixed research makes use of the pragmatic method and system of philosophy. Its logic of inquiry includes the use of induction, deduction and abduction which is the uncovering and relying on the best of a set of explanations for understanding one’s results (de Waal, 2001).

This study took the middle ground of mixed research by employing both approaches. The main justification being the need to find a legitimate use of multiple approaches in answering research questions, rather than restricting or constraining researchers’ choices. The approach is an expansive and creative form of research and not a limiting form of research. The most fundamental issue on this philosophy is that the research methods should follow research questions in a way that offers the best chance to obtain useful answers. Many research questions and combinations of questions are best and most fully answered through mixed research solutions.

### **3.3 Research design**

Kothari and Garg (2014) define research design as a conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. Orodho (2003) defines it as the scheme, outline or plan that is used to generate answers to the research problem. Mugenda and Mugenda (2003) define this as simply the framework or blue print for the research. Kothari and Garg (2014) enumerate features of a good research design as flexible, appropriate, efficient and economical. Kothari and Garg further state that good research should minimize bias and maximize on reliability.

There are basically two distinct types of research designs in social research. Exploratory research design and descriptive/diagnostic research design. Exploratory designs focus on formulating a problem for more precise investigation. It is a flexible design that allows for consideration of different aspects of a problem. In such a design qualitative approach is mainly used to allow for the flexibility (Mugenda & Mugenda, 2003). On the other hand, descriptive/diagnostic research design is a design that is rigid and makes enough provision for protection against bias and seeks to maximize on reliability. It uses a well-structured and thought out instrument for collecting data and employs pre-planned designs for data analysis. It also employs probabilistic sampling methods whenever sampling is required (Kothari & Garg, 2014; Mugenda & Mugenda, 2003). The design applied in this study was diagnostic survey design. It is the most appropriate because it is concerned with associations or relationships between variables. It seeks to minimize bias, utilize largely a structured instrument and apply a preplanned design for data analysis. Also, the study sought to obtain information that describes existing phenomena by asking individuals questions about their perceptions as well as explaining the status of two or more variables at a given point.

### **3.4 Target population**

Population refers to the entire group of people or things of interest that the researcher wishes to investigate (Kothari & Garg, 2014; Sekaran, 2010; Mugenda & Mugenda, 2003). The target population therefore was all plantation tea estates in Kenya because of their potential to adopt mechanized tea harvesting technology. Data available from the Agriculture, Foods and Fisheries Authority- Tea Directorate (2014) indicated that there are about 55 plantation tea estates in the plantation segment of the subsector Kenya. The target respondents were therefore 55 managers in charge of the 55 plantation tea estates. The choice of managers as respondents was mainly due to their decision making and implementation roles.

### **3.5 Census enquiry**

Owing to the small nature of the population which was only 55 estates, the study adopted the census enquiry approach following Kothari and Garg (2014) who suggested that if the target population is not so large, census survey may provide better results than sample surveys. Furthermore, it is assumed that in such inquiry, no element of chance is left and highest level of accuracy is obtained. The use of census approach thus eliminates the fears of not achieving external validity that is normally associated with sampling since the entire population is used.

### **3.6 Data collection instruments**

Creswell (1998) defines data collection as a means by which information is obtained from the selected subjects of an investigation. Kothari and Garg (2014) states that in survey designs, the appropriate data collection instruments may be observation, interview or questionnaires. In this study, the primary research data was collected using questionnaires (See Appendix 1). The questionnaires consisted of structured and open ended questions. The significance of inserting open ended question on the questionnaire as suggested by Kothari and Garg (2014) was that it provided a complete picture of respondent's feelings and attitude which is critical for this particular study which looks at the perception of managers of particular stakeholder groups. The structured questions were therefore designed to collect some quantitative data whereas the open ended questions were designed to capture opinions of the respondents with regards to the variables under investigation. The questionnaires hand delivered to the respondents, who read, understood and filled them appropriately. Once administered, the questionnaires were collected, checked for completeness and consistency and coded.

### **3.7 Pilot Test**

Pilot test is an activity that assists the research in determining if there are flaws, limitations, or other weaknesses within the data collection instruments. It allows the

researcher to make necessary revisions prior to the implementation of the study. According to Kothari and Garg (2014), conducting a pilot involves a few of the target population being given the questionnaires with an intention of pre-testing the questions. A pilot study therefore was undertaken on 10% of the target population to test the reliability and validity of the questionnaire. This is based on the rule of thumb is that 1 to 10 percent of the sample should constitute the pilot test (Cooper & Schilder, 2008; Kothari & Garg, 2014).

### **3.7.1 Reliability of instrument**

The reliability of an instrument refers to its ability to produce consistent and stable measurements (Mugenda & Mugenda, 2003). Reliability is therefore the measure of the degree to which a research instrument yields consistent results. It is simply a measure of consistency. The reliability is influenced by random error. There are basically three components of random error. First, errors that arise from inaccuracy of the instrument itself, the errors arising from the inaccurate entries by the researcher and errors that is unexplained. The three types of errors therefore combine to produce inconsistencies that make the data collected unreliable.

In order to obtain reliable data, the researcher hired adequate research assistants to ensure that there is no fatigue that could lead to inaccurate data capture. The research assistants were trained and motivated by offering them a fair remuneration to ensure that they committed to carrying out honest and accurate data collection thus eliminating the errors due to inaccurate scoring by the researcher. Furthermore, a supervisor was also appointed with the responsibility of verifying the validity of the filled up questionnaires. Further spot checks were done by the researcher through direct contact with the respondents using contacts obtained during the pilot study.

Errors relating to inaccuracy of the instrument were eliminated by carrying out reliability test of the research instrument by the use of internal consistency technique. For each concept of interest, the scores of each statement were correlated with scores

from other statements measuring the same concept in the instrument. Cronbach's coefficient alpha which is the most common reliability coefficient for estimating internal consistency by determining how all items on a test relates to all other items and to the total test was then computed. The reliability is expressed as a coefficient between 0 and 1.00. Cronbach's alpha is a general form of Kuder-Richardson (K-R) 20 formula which is stated thus;

$$KR_{20} = \frac{(K)(S^2 - \sum s^2)}{(S^2)(K - 1)}$$

Where:

$KR_{20}$  = Reliability coefficient of internal consistency, the cronbach's alpha.

$K$  = Number of items used to measure the concept

$S^2$  = Variance of all scores

$s^2$  = Variance of individual items

Cronbach's alpha value is widely used to verify the reliability of a construct. The higher the coefficient, the more reliable is the test. The researcher therefore used Cronbach's alpha to determine the reliability of the instrument and specifically to test the reliability of the proposed constructs.

### **3.7.2 Validity of the instrument**

Validity is the most critical criterion and indicates the degree to which an instrument measures what it is supposed to measure (Kothari & Garg, 2014). Validity can be considered in three forms, first, content validity which is the extent a measuring instrument provides adequate coverage of the topic. Secondly, criterion validity which reflects the success of measures used for some empirical estimating purposes

in terms of relevance of the measure, freedom from bias, reliability and availability of information of the concept. Finally, construct validity which measure the degree to which data from the instrument meaningfully and accurately reflects or represent a theoretical concept (Mugenda & Mugenda, 2003).

In this study, the instrument was designed to capture content validity by ensuring that it covers all concepts of stakeholder pressure which is outlined in the objectives of the study and which is informed by the generic classification of stakeholder groups by Freeman (1984) in his stakeholder theory. Furthermore, the instrument addresses criterion validity by using the census enquiry which eliminates issues of bias that is related to representativeness of the sample. The measures used to operationalize the variables are available and have been used in similar studies in the past as indicated in Baldwin and Sabourin (1999), Misoi *et al.* (2015), Mitchel *et al.* (1999), Addison and Belfield (2004) and Delmas and Toffel (2008).

Finally, as regards construct validity, the concepts measured are supported by the appropriate theories laid out in chapter two under theoretical framework. The items on the instrument relating to a specific variable in which the respondent were required to give an opinion were tested for their validity. The appropriate technique was principle component analysis of factor analysis. The technique was expected to minimize bias due to common methods by ensuring that items with low factor loadings are dropped. The cut off in this study was based on Kothari and Garg (2014) who considered factor loading of 0.33 as sufficient.

### **3.8 Operationalization of variables**

In order to measure owners' pressure influence on adoption of mechanized tea harvesting technology, the study sought to establish the extent of shareholding by local and foreign investors. Furthermore shareholder pressure management perception was also be measured through a perception scale which captured stakeholder attributes of power, urgency and legitimacy as envisaged by Mitchel *et al.*

(1997). The respondents scored the attributes based on their opinions on the extent in which they agree with the statements. Employee pressure perception operationalization therefore followed Addison and Belfield (2004) and Wood (1996) who used the presence of a union or its density and coverage to measure their effect and management perception of stakeholder group power, legitimacy and urgency as proposed by Mitchel *et al.* (1997) was captured in a likert scale.

Customer pressure was operationalized by measuring the extent to which the direct customers considered firms practices in regard to the impact of technology on the product as used by Delmas and Toffel (2008) to measure coercive pressures from customers. The proxy for customer pressure in this study was the percentage of certified product of the mechanically harvested product. Management perception of customer pressure was also measured using the stakeholder attributes of power, legitimacy and urgency as per Mitchel *et al.* (1997) and captured in a 5 point likert scale.

Community pressure was measured using propensity for collective action indicator as suggested by Delmas and Toffel (2008). The reason for this measure is that communities with a higher propensity for collective action are likely to be capable of exerting greater institutional pressure on local firms. The proxy for a community's propensity for collective action was the proportion of the population proximate to each firm. It can be argued that high proximate population pose a lot of pressure to firm's adoption of mechanized tea harvesting technology. Also, the study used number of job requests by the community. To complement this measure, management perception of community pressure was measured using the management perception of stakeholder attributes of power, legitimacy and urgency as per Mitchel *et al.* (1997).

Government pressure was measured using number of regulatory inspections conducted at a firm over the past three years an adaptation of Delmas and Toffel (2008), Cassini's and Vales (2002) and Hanna and Anton (2002) who used similar approach. This was be complemented by use of management perception scale to

measure the extent to which regulators threaten to or actually impede a company's mechanized tea harvesting technology adoption. In this regard, stakeholder group pressure utilizing the stakeholder attributes of power, legitimacy and urgency as developed by Mitchel *et al.* (1997) was applied.

For the purpose of capturing the dependent variable of mechanized tea harvesting technology adoption, this study built on the construct for measuring process innovation on the basis of criterion which was conceptualized and used in previous empirical studies of innovation such as Serener (2008) and Gamma, Selah and Elroy's (2011) that used sales volume of the new product. This however had a slight modification to suit the tea industry and nature of innovation as captured by Misoï *et al.* (2015). This study measured adoption by computing the percentage of total production volume of tea harvested using mechanized harvesting technology. Additional measures for the dependent variable were the proportion of the total production area that had been put under mechanized tea harvesting and the proportion of the overall budget that is related to research and development in mechanized tea harvesting technology. The purpose of the three metrics is that they could indicate how successful the uptake of the innovation is. To aid further in the analysis, the innovation was collapsed into a binary variable of adoption and non-adoption of mechanized tea harvesting technology following Rogers (2003) definition of adoption which is the first or minimal level of behavioural utilization. A firm that indicated that they either had put some area under mechanization was considered as adopters of the technology were assigned a dummy variable of 1 whereas the non-adopters were assigned a dummy variable of 0.

### **3.9 Data processing and analysis**

All qualitative responses were analyzed using content analysis whereas descriptive and inferential statistics was used for the quantitative variables. The statistical package for social sciences (SPSS) was employed in the analysis. The quantitative data was summarized using the descriptive statistics of means and the standard

deviations and secondly analyzed using independent samples T-test and logistic regression. The study used T-test to establish if there existed any association between the dependent variable of innovation and the independent variables of stake holder pressure by comparing weather the two categories of dependent variables, specifically, if the non-adopters and the adopters of MTH technology were significantly different or not with respect to the independent variable in question.

Logistic regression analysis was then carried out to establish the nature of association, predictive value and the goodness of fit of the model. The dependent variable of innovation was collapsed into dichotomous variable of the adopters of MTH technology and the non-adopters. The logistic model is based on a binary distribution where there are two possible outcomes. The possible outcomes in this study was defined as  $Y=0$  (Non adoption of MTH technology), or  $Y=1$  (Adoption of MTH technology).  $X$  was used to denote the vector of independent variable of perceived stakeholder pressure. Based on Comely & Vandal (2003), the binary logistic regression gives the probability of  $Y=1$  given  $X$  and is expressed as follows;

$$P(Y = 1|X) = \frac{1}{1 + \text{Exp}(-\beta X)}$$

By solving this equation  $Y$ , the form for the binary logistic regression model is obtained;

$$\ln \frac{P(Y = 1|X)}{P(Y = 0|X)} = \text{logit}(Y) = Z = \alpha + \beta X$$

$Z = \alpha + \beta X$  was the linear predictor, where  $X$  is the predictor variable and  $\beta$  is the

respective coefficient of the predictor variable of the perception of stakeholder pressure and  $\alpha$  is the constant or the logistic transformation of  $Y$  intercept. The

logistic regression was therefore run for each individual variable of stakeholder pressure to establish the coefficients of the model which then was used to establish the likelihood of adoption of technology innovation by a firm given the perception of stakeholder pressure levels.

## **CHAPTER FOUR**

### **RESEARCH FINDINGS AND DISCUSSION**

#### **4.1 Introduction**

This chapter reports the findings of the study that aimed at investigating the Perceptions of Stakeholder Pressure on mechanized harvesting technology adoption in the tea subsector in Kenya. The findings relate to the research objectives which sought to test the following research hypotheses (1) Ho: Perception of owners does not influence mechanized harvesting technology adoption in the tea subsector in Kenya. (2) Ho: Perception of employees does not influence mechanized harvesting technology adoption in the tea subsector in Kenya. (3) Ho: Perception of customers does not influence mechanized harvesting technology adoption in the tea subsector in Kenya. (4) Ho: Perception of community does not influence mechanized harvesting technology adoption in the tea subsector in Kenya. (5) Ho: Perception of government does not influence mechanized harvesting technology adoption in the tea subsector in Kenya.

The independent variables arising from the research hypotheses namely owners, employee, customer, and community and government stakeholder pressure were individually analyzed based on the information from the collected questionnaires. This chapter presents both the descriptive and inferential analysis. This is then followed by interpretation and discussion. The data was analyzed both quantitatively and qualitatively.

## 4.2 Pilot study results

### *Reliability*

Pilot study was carried out on 6 estates which made up 10% of the target population. The results from the pilot study were subjected to reliability test so as to confirm the reliability of the tool. The Cronbach alpha ranged from 0.755 to 0.905. Initially, Perception of government had 6 items with cronbach's value of 0.639. 2 items which were found to be redundant were dropped resulting in a new Cronbach alpha value for the variable of 0.829. The overall Cronbach alpha was 0.832 as shown in Table 4.4.

**Table 4.4: Reliability statistics**

Variable	Cronbach's Alpha	Number of Items
Perceived Owners' Pressure	0.809	6
Perceived Employee Pressure	0.839	6
Perception of customers	0.755	6
Community pressure perception	0.905	6
Perception of government	0.829	4
<b>Overall</b>	<b>0.832</b>	<b>28</b>

The improved tool was therefore deemed reliable based on Cooper and Schindler (2008) and Saunders, Lewis and Thornhill (2009) who intoned that a Cronbach's alpha coefficient of 0.7 is adequate.

### ***Instrument Validity***

Principal component analysis of the factor analysis was used to check on construct validity of the instrument. Construct validity refers to the measure of whether the instrument measures what it purports to measure (Kothari & Garg, 2014). Factor loadings for each item and their corresponding constructs or the study variable of perceived owners, employees, customer, and community and government pressure were computed. The comprehensive analysis of how each item loads to the relevant factor is attached in Appendix 5.

Aladwani and Pavla (2002) observe that there are no accepted “absolute” standards for the cut-offs for factor loadings, the choice is based on judgment, purpose of the study and prior studies. However, the rule of thumb as suggested by Hair, Rolph and Tatham (1987) is that item loadings greater than 0.30 are considered significant whereas those greater than 0.40 are more important and those that are over 0.50 are considered very significant. Kothari and Garg (2014) consider factor loading of 0.33 as sufficient. In this study a cut off of 0.4 was used and all the items met the criteria except for two items in the perceived government which were way below 0.4 were therefore considered as important and were retained in the instrument.

### **4.3 Response Rate**

Forty nine questionnaires were hand delivered to tea plantation estates across the Kenya tea industry. This excluded 6 estates which had been used to carry out the pilot study. 35 were successfully filled and returned giving a response rate of 71% as indicated in Table 4.1.

**Table 4.1: Response rate**

Total questionnaires issued	Questionnaires filled and returned	Questionnaires not returned	Percent response rate
49	35	14	71%

This was deemed adequate for the study based on Neuman (2000) and Mugenda and Mugenda (2003) who opined that response rate of above 50% is adequate for a survey study. In fact, Mugenda and Mugenda suggested that 50% response rate is adequate, 60% is good and above 70% very good for a survey study.

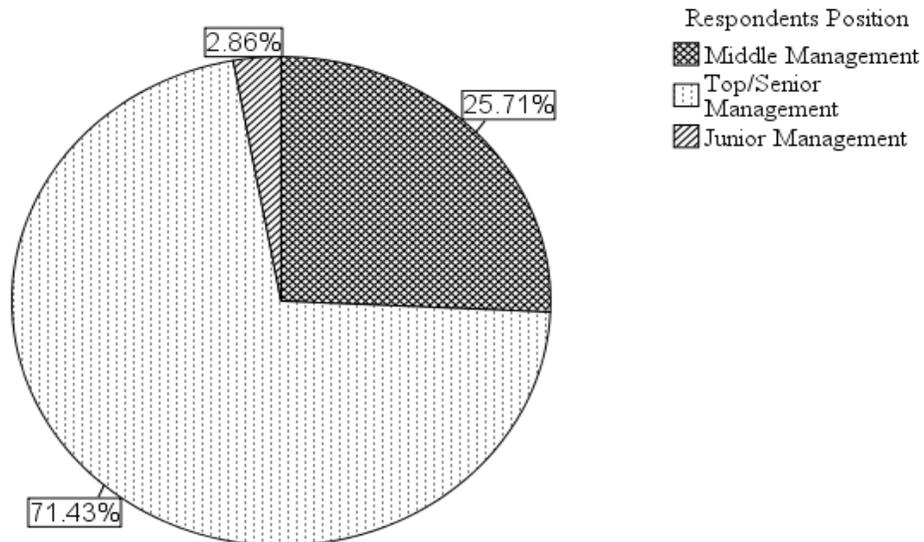
#### **4.4 Population characteristics**

The information sought in the introductory section of the questionnaire was targeted at providing background knowledge of the respondent as well as the population's salient characteristics that could contribute in understanding the parameters of the study. The information included the management position and the experience of the respondent in the organization. This information was necessary in ensuring that information provided by the respondents would be relied upon. Also information on the size of the organization in terms of area under tea and also in terms of employee population were sought so as to ensure that the researcher and users of research findings could have feel of the importance of the individual industry player.

##### **4.4.1 Respondent's position**

The question sought to establish the position of the respondent in the organization. The respondents were managers and whose perception of other stakeholder groups the study sought. Managers have direct control over the decision making apparatus of the firm (Hill & Jones, 1992). They were categorized in to three main cadres, the top or senior management, middle level and the junior management. The findings show that 71.43%

of the respondents were top management whereas middle and junior management were 25.71% and 2.86% respectively as demonstrated in Figure 4.1.



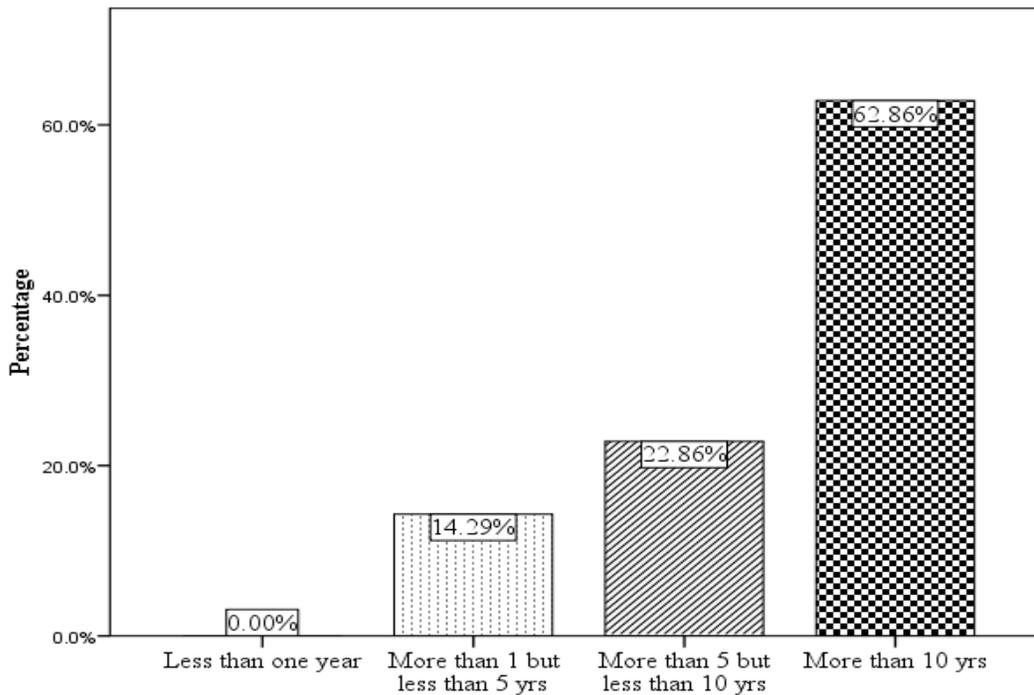
**Figure 4.1: Respondents' Management Position**

The findings indicate the bulk of the respondents were from top and senior management who were deemed appropriate for this study. The suitability of the respondents is supported by Kraut, Pedigo, Mckenna & Dunnete (1989) who defined the tasks of top executives as encompassing the monitoring of business environment. The appropriateness of the respondents is further shored up by upper echelons perspective of Hambrick and Mason (1984) who posited that organizational outcomes such as strategic choices and performance levels are partially predicted by managerial background characteristics. This is also further supported by Staw and Sutton (1993) who suggested that powerful individuals, such as CEOs, can influence behavior in organizations by shaping strategic decisions.

The results show that the respondents were majorly top managers and it can be tentatively concluded that the respondents were from the appropriate level of management since this group is expected as indicated by extant literature to be actively involved in the environmental scanning and decision making such as adoption of technology. The perception of the managers on matters of stakeholders was therefore considered important.

#### **4.4.2 Respondent's length of service**

As part of background information, question was posed on the length of service in years of the respondent. The main purpose of this question was to have the confidence that the respondents had adequate experience in the subsector that was necessary enough to have a clear understanding of stakeholder pressures that affect the industry. From the results, 62.86% had over 10 year's length of service with their organization whereas 22.86% had worked for between 5 and 10 years. Only 14.29 percent had worked for less than 5 years as demonstrated in Figure 4.2.



**Figure 4.2: Respondents' length of service**

Length of service has got a direct relationship with skills. The majority of the respondents had long experience therefore considered appropriate. This observation is supported by Kelley and Helper (2006) who propounded that previous experience with related technologies influences adoption of technology. This is because such experience makes it easier for managers to avoid costly disruptions of production, or at least anticipate their occurrence and hence minimize their effects. This experience should lead to lower costs of adoption, hence increasing its probability. Also, the findings are further supported by Hall and Khan (2002) who established that adoption of new technology might be slow technology if it requires complex new skills. The high proportion of experienced managers is also considered appropriate based on Rahab and Hartono

(2012) who argued that acquisition of sufficient internal expertise can determine the timing of adoption of the innovation.

In this study, a significant number of respondents had therefore worked long enough and it can be cautiously concluded that the respondents were expected to be in a position to grasp the organization’s threats and opportunities and also understand the various stakeholder groups and their importance in either supporting or resisting the organizational pursuit of innovation.

#### **4.4.3 Size of the tea estate**

A question was also put to the respondent on the size of the tea estate. This was important in ensuring that the researcher and the subsequent users of the information emanating from this research got to understand the importance of the industry economically and the potential for the firms therein to pursue innovation. The estates were categorized generally into small and big. The small estates were those with less than 200 hectares under tea whereas big estates were those with over 200 hectares under tea. Information obtained shows that only 14.3% of the estates were small whereas 85.7% were large as indicated in Table 4.2.

**Table 4.2: Size of the tea plantation estate**

	Frequency	Valid Percent
Small (Less than 200 Hectares)	5	14.3
Big (More than 200 Hectares)	30	85.7
<b>Total</b>	<b>35</b>	<b>100.0</b>

From, the results, most of the firms were big and were expected to pursue innovation. This firm size has been previously linked with innovation. This expectation is supported by Kimberley and Evanisko (1981) who opined that innovation adoption is positively related to organizational size. Also, Kelley and Helper (2006) posited that a firm's propensity to adopt a new technology is a function of organizational capabilities related to size. A similar view is held by Mole, Ghobadian, O'Regan and Liu (2004) who observed that firm size is important partly because of its role as the source of capabilities. Dosi (1988) conceive that heterogeneity in the size of businesses affects the expected profitability of the innovation among firms thus explaining variation in adoption of new technology among businesses.

The findings on the firm size which show majority of firms being large therefore leads to a tentative inference that there is a potential for the firms in the tea subsector in Kenya to pursue innovation in MTH technology based on the observations from the aforementioned literature. It is further suggested that large firms are more likely to undertake innovation because they are also likely to have financial resources required for purchasing and installing the new technology.

#### **4.4.4 Number of employees**

The breakdown of the observed estates in terms of number of employees indicates that 11.4% had less than 200 employees whereas 5.7% had 200 to 400 and another 5.7% had 400 to 600 employees. The bulk of the estates had large number of employees with 600 to 800 and over 800 employees making 31.4% and 45.7% respectively. This is demonstrated in Table 4.3.

**Table 4.3: Number of employees**

	Frequency	Percent	Valid Percent
Less than 200	4	11.4	11.4
200-400	2	5.7	5.7
400-600	2	5.7	5.7
600-800	11	31.4	31.4
Over 800	16	45.7	45.7
<b>Total</b>	<b>35</b>	<b>100.0</b>	<b>100.0</b>

The purpose of this question was to validate those of the size of the organization. The employee numbers have been used in various studies to depict the size of the organization. Love *et al.* (2005) argued that business size can be measured by the number of employees. The use of number of employees to measure organization size has been done alongside other measures such as financial resources and also sales volume (Kimberley & Evanisko, 1981; Kelley & Helper, 2006).

The findings indicate that majority of firms in the tea sub sector employ substantial number of employees. The results validate those of the size of the organization. The tentative implication based on extant literature aforementioned is that the firms are likely to have a relationship with mechanized tea harvesting technology.

#### **4.5 Study variables**

The study set out to establish the influence of stakeholder pressure perceptions on mechanized harvesting technology adoption in the tea subsector in Kenya. To achieve this, five independent variables were identified namely owners', employee, customer,

community and government pressure. The relationship of these variables and innovation in the tea subsector are discussed in subsequent discourse.

#### 4.5.1 Innovation in the tea subsector

The main objective of the study was to establish the influence of stakeholder pressure perceptions on mechanized harvesting technology adoption in the tea subsector in Kenya. Innovation in the study was understood in the context of adoption of process innovation and specifically on mechanized harvesting (MTH) technology. Innovation as the dependent variable was measured using the proportion of tea area under mechanized tea harvesting, the volume of tea harvested using the MTH technology and also by capturing the proportion MTH technology in the research and development budget. To enable appropriate statistical inference to be used, the variable was collapsed into a binary variable of adopters and non-adopters of MTH technology.

##### 4.5.1.1 Proportion of tea area under mechanized harvesting

Proportion of tea area under mechanized tea harvesting was obtained through a question posed directly to the respondents. The mean tea area in the estates under mechanized tea harvesting was 31.77 percent as shown in Table 4.5.

**Table 4.5: Percent of tea area under MTH technology**

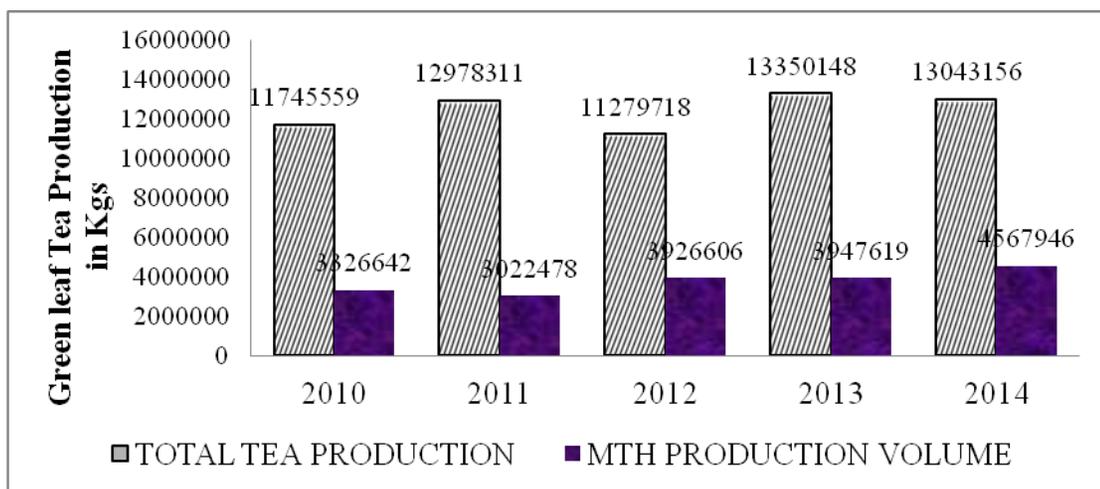
N	Mean	Std. Deviation	Minimum	Maximum
35	31.77	30.87	0	100

The information represented the level of adoption of the technology therefore indicating the level of mechanized harvesting technology adoption in the tea subsector in Kenya.

The results compare with that of Misoi, Wario and Orwa (2015) who had established that of tea area in Kenya had been put under MTH technology was 32% of the total tea area. The findings are however higher than that of Maina and Kaluli (2013) who had estimated the proportion of mechanized area at 2.3%. The difference may be attributed to the increasing trend in mechanization as predicted by Ongoing and Achieng (2013) and also the fact that the area in study by Maina and Kaluli (2013) referred to a specific region and not the entire country.

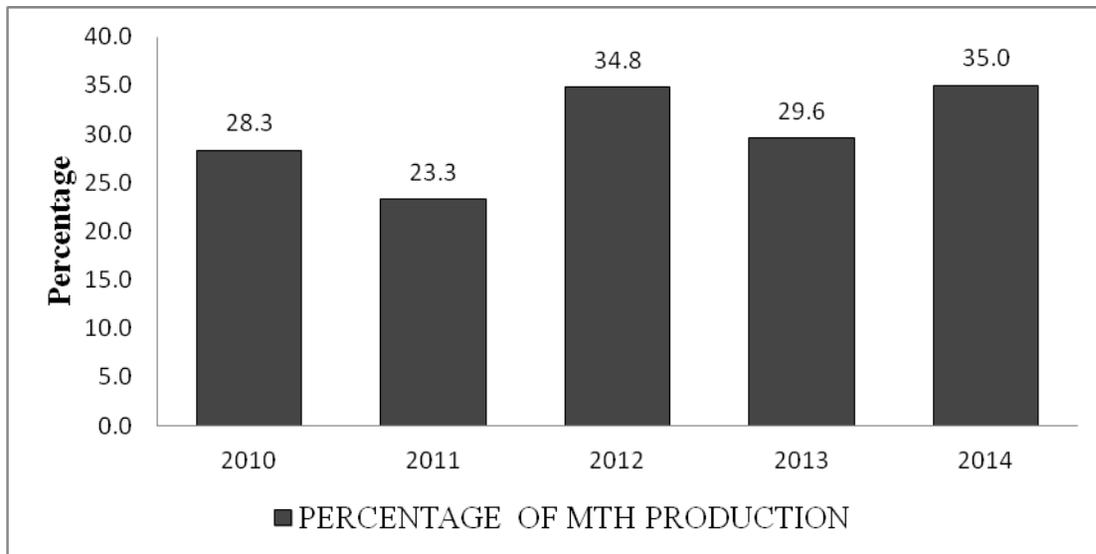
#### 4.5.1.2 MTH tea production by volume

The total volume of crop obtained in the plantation estate over the past five years, for period, 2010, 2011, 2012, 2013 and 2014 was compared with that harvested using mechanized tea harvesting technology over similar period. The overall production in absolute terms grew from 11,745,559 Kgs to 13,043,156Kgs whereas MTH technology production increased from 3,326,642 to 4,567,946 Kgs respectively as indicated in Figure 4.3.



**Figure 4.3: Comparative tea production volume**

To aid further in interpretation, mechanically harvested crop volume was presented also as percentage of the total production over the same period. In 2010, the proportion of MTH crop was 28.3% and gradually grew to 35.0% by the year 2014 as indicated in Figure 4.4.



**Figure 4.4: Trend of MTH technology tea production**

The graphs depict the level of process innovation in the tea subsector by computing the percentage of total production volume of tea harvested using mechanized harvesting technology. This was a slight modification from that used by Serener (2008), Gamma, Selah and Elroy's (2011) and Varies and Bitumen (2010) who measured innovation using introduction of new products and comparing with the revenues of the enterprise. The approach was however similar to that of Misoi et al. (2015) who used it in a study on institutional factors influencing strategic choice in the tea subsector in Kenya.

An interim conclusion from the finding therefore can be made that process innovation in the context of mechanized tea harvesting is evident in the tea subsector and the trend is on the increase.

#### 4.5.1.3 Proportion of R&D budget in MTH technology

Another way of measuring innovation is by use of R&D budget. This backed by suggestion by Hunks (1998) who described innovation as the successful technical and economic implementation of an idea. In this research, respondents were asked to state the percentage of MTH technology budget in the entire R&D budget. Table 4.6 indicate that mean percentage of MTH technology expenditure in the R& D budget is 2.41%.The minimum funds put to MTH technology in the R&D is zero percent in some organization whereas some organization allocate as high as 15%.

**Table 4.6: Percent of R&D budget in MTH technology**

N	Std.			
	Mean	Deviation	Minimum	Maximum
35	2.41	3.47	0	15

The findings compare well with a previous similar study by Kumar (2004) who observed that investment in research and development leads to new products which are a form of innovation. The R&D expenditure budget in this study was comparable with that found by Avermaete, Viaene and Morgan (2002) who similarly used R&D as a proxy for measuring innovation in the study of determinants of product and process innovation in small food manufacturing firms and established that R&D expenditure was 1.43% of the total revenue. Furthermore, the findings are also analogous with that of Le Bars, Mangematin and Nesta (1998) who established that R&D expenditure of less than 1.7% was sufficient for a firm to churn out at least one innovation.

It can immediately be seen from the findings that firms in the tea subsector have interest to innovate as evidenced by the allocation of resources to research and development.

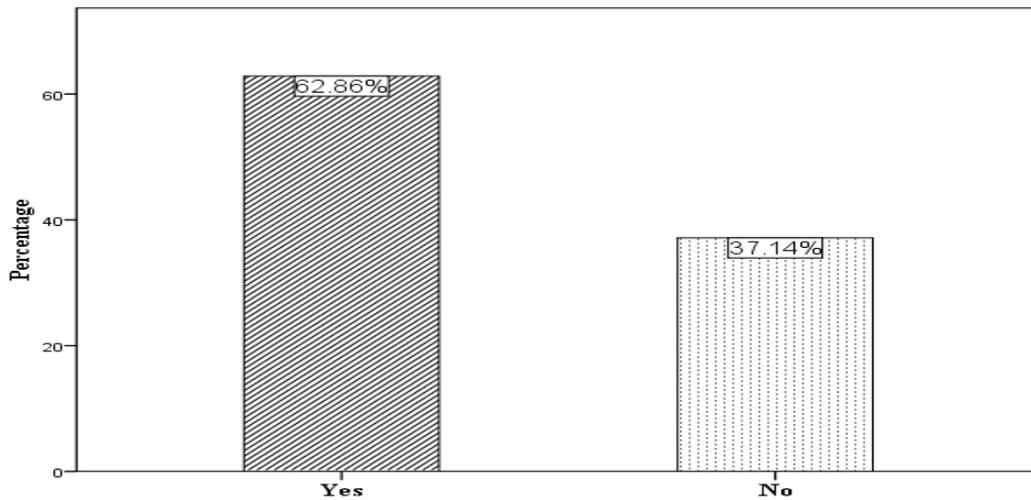
#### 4.5.1.4 **Transformed variable of innovation**

The variable of adoption of mechanized tea harvesting technology was simplified into a binary variable of those who have adopted and those who have not adopted. The adopters of the technology were assigned a dummy variable of 1 whereas the non-adopters were assigned a dummy variable of 0. The collapsing of the variable into groups of adopters and non-adopters easily lent itself to the use logistic regression model.

#### 4.5.2 **Influence of perception of owners**

##### *Qualitative analysis*

The study sought to establish the influence of perception of owners on mechanized harvesting technology adoption in the tea subsector in Kenya. In a quest to achieve this objective, respondents were asked to give their opinion on whether ownership type based on level of foreign shareholding, influences the firm's decision on adoption of MTH technology. 62.86% answered in affirmative whereas 37.14 gave negative response as shown in Figure 4.5. A summary of reasons given to back up their response are provided in Appendix 3.



**Figure 4.5: Respondents opinion on influence of ownership type**

Qualitative analysis of the affirmative responses indicated varied reasons. First, some respondents argued that in the case of locally owned firms, one of the overriding business objectives was to provide jobs. This objective therefore constrained management in pursuing innovation in the area of MTH technology as this was seen as working against this specific objective of the firm. This observation is in line with Jacobs *et al.* (2013) who argued that a key external threat to success of organizational change is legitimacy erosion.

Secondly, for firms that were mostly or wholly owned by foreigners, it was argued by the respondents that the overall strategy of such firms was to improve their profitability and therefore pursuing of technology was seen as the obvious thing to do. This argument by the respondents agrees with Zakić *et al.* (2008) who in their review of external and internal factors affecting the product and business process innovation, opined that a company will pursue innovation if it expects to benefit from it. The respondents furthermore saw mechanization as gaining currency globally due to its cost reduction

benefits. Foreign companies were seen to have piloted the innovations in search of best ways of doing business. This view by the respondents also corroborated the suggestion by Crispi *et al.* (2007) that foreign owners have more experience using high technology and organizational practices that best suit it. The respondents, whose views on influence of ownership type on innovation were negative, however argued that mechanized tea harvesting was a sound business decision and did not depend on the ownership of the firm. Some respondents however opined that local firms lacked knowledge on MTH technology thus being indifferent to the technology, a view that still further buttresses the argument by Crispi *et al.*

Since the findings indicate that the majority of the respondents felt that ownership influenced innovation in the tea subsector and based on the aforementioned literature, it can be tentatively inferred that owners are an important stakeholder group that management must take their views into consideration with regard to adoption of mechanized tea harvesting.

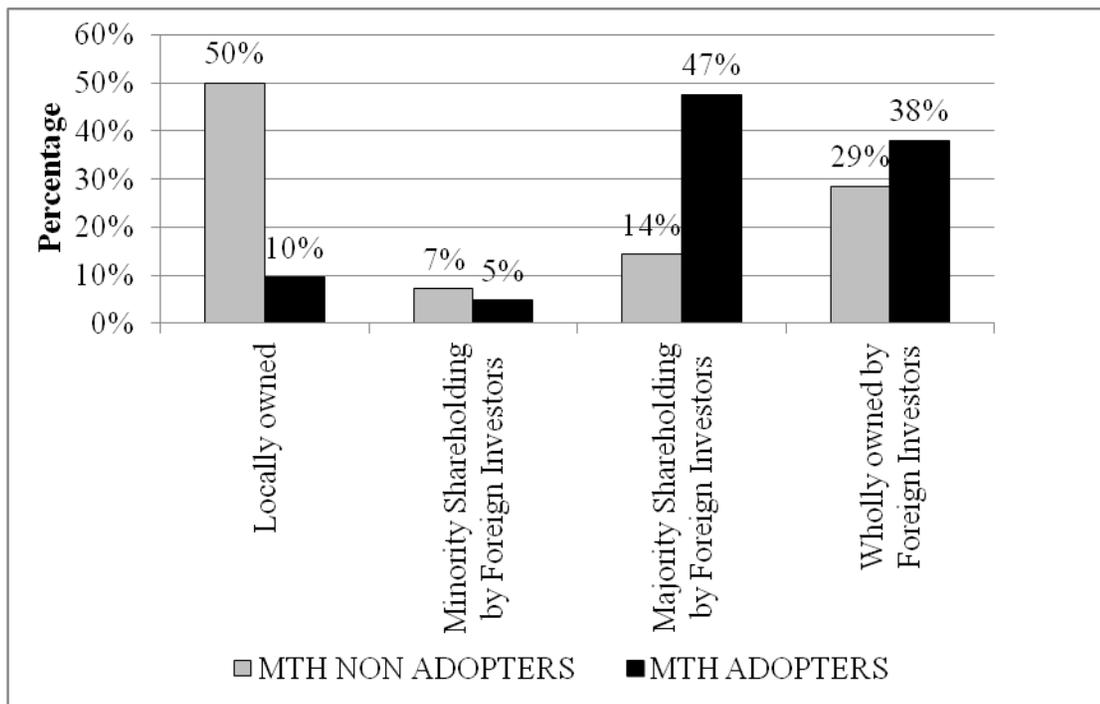
### ***Quantitative analysis***

Perception of owner's pressure was measured using ownership type by shareholding and also through management perception as captured through questions posed to the managers by way of a likert scale. The questions focused on innovation related questions.

### ***Ownership type by shareholding***

Ownership of the estates was categorized into four categories namely, locally owned, minority shareholding is foreigners, majority shareholding is foreigners and finally, those that are wholly owned by foreigners. A comparison of the firms which had adopted and those that had not adopted MTH technology shows that a combined

percentage of 57% for the locally owned and those with minority foreign shareholding had not adopted the MTH technology compared to 15% who had adopted the technology. Firms with majority of shareholders as foreign and those wholly owned by foreigners had 43% as non adopters compared to 85% who had adopted MTH technology as depicted in Figure 4.6.



**Figure 4.6: Ownership type by shareholding**

The findings therefore indicate that the majority of MTH technology adopting firms were either mostly owned or wholly owned by foreigners. This suggests that high foreign shareholding in the tea subsector in Kenya is possibly contributory factor that influences process innovation of MTH technology. This finding agrees with Baldwin and Sabourin (2000) who in their study of innovational activities in Canadian food industry concluded that foreign ownership has relevant influence on process innovation.

Similarly, these findings echo those of Misoi *et al.* (2015) who established that foreign owned firms had a high propensity to adopt technology than local firms. It is also in consonance with Brown *et al.* (2010) who also observed that foreign owners are likely have better access to financing than local firms which enables them to invest in innovation activities.

From these findings it can be cautiously deduced that ownership of the firm is an important factor in the tea subsector in Kenya with regards to innovation in the context of mechanized tea harvesting technology. This therefore is expected to possibly present some pressure on the firm with regards to decision to pursue innovation in mechanized tea harvesting technology.

#### ***Management perceptions of owners' pressure on mechanized tea harvesting technology adoption***

Opinions were sought from the respondents on how they perceived owners with regard to adoption of MTH technology. To this end different statements relating to innovation reflecting owners attributes of power, urgency and legitimacy were put to the respondents. The respondents were required to indicate the extent to which they agreed with the statements. The scores ranged from 1 to 5 with the lowest score of 1 representing the lowest perceived pressure whereas the highest score of 5 representing the highest perceived pressure. Rating above 3 was considered to be an indicator of high owner stakeholder pressure whereas rating below 3 was considered to indicate low stakeholder pressure of the owners.

The respondents agreed that 91.4% of owners were kept informed on the operational decisions of the company. The mean rating of the response was 4.63. This indicates that owners' required to be constantly informed of operations within the organization. This

also indicates that there is a lot of pressure from the owners to understand what the management team is doing on the day to day operations of the firm. There is also high involvement of the owners in the running of the organization as indicated by the high score of 3.95 with 74.2% respondents agreeing moderately to a great extent to the second question which was posed to them that to what extent owners participate in the running of the organization. All other questions posed to the respondents, specifically, the owners knowledge in the company's business, the owners priority to innovation issues, the extent in which the owners view innovation as an immediate means of exploring new opportunities and the extent to which owners view innovation as an urgent matter to be pursued for the firm's survival had high scores of 3.94, 3.80, 4.14 and 3.94 indicating high level of perceived owners pressure. Each of the statements had over 62% of the respondents scoring a rating of "moderately" to "a great extent". The data on perception of owners is presented in Table 4.7.

**Table 4.7: Perception of owners descriptive statistics**

	Not at all	Slightly	Somewhat	Moderately	To a great extent	Mean
Owners are kept informed on the operational decisions of the company.	0.0%	2.9%	31.4%	17.1%	48.6%	4.11
Owners participate in the running of the organization.	0.0%	2.9%	22.9%	48.6%	25.7%	3.95
Owners are knowledgeable in the company's business.	0.0%	11.4%	22.9%	25.7%	40.0%	3.94
Owners give priority to innovation issues.	0.0%	14.3%	22.9%	31.4%	31.4%	3.80
Owners view innovation as an immediate means of exploring new opportunities.	0.0%	2.9%	20.0%	37.1%	40.0%	4.14
Owners view innovation as an urgent matter to be pursued for the firm's survival.	0.0%	14.3%	14.3%	34.3%	37.1%	3.94

The findings indicate an overall high rating for perception of owners implying therefore that owners are a very important constituent of the firm. For example the high rating on the statement on the management need to be informed on operational changes shows how important the owners as a stakeholder group is. This observation is in consonance with Jensen (2000) who argued that shareholders should be given the most importance in managerial decisions because they are the only constituency of the corporation with a long-term interest in its survival. Also, the specific high rating on the statement on owner's participation is an indication of the culture of the organization which shows a very high involvement by owners in the organization's operations. This finding is in concurrence with those of Ndah *et al.* (2010) who in their overview of adoption modeling approaches asserted that culture of the organization can inhibit or drive adoption yet organization's culture is dependent on the founders or owners of the organization. The view is also in line with that of Brown *et al.* (2010) who found that some owners and governance arrangements may better facilitate investment choices or implementation, resulting in higher levels of investment or higher returns and hence superior performance.

The results implying the importance of owners is further in congruence with Zakić *et al.* (2008) who in their review of external and internal factors affecting the product and business process innovation established that a company will pursue innovation if it expects to benefit from it. Also the owners with clear mission of business profitability and survival will concern itself on cheaper ways of doing business. Provisional conclusions can therefore be made from the findings that indicate high ratings in each item of the perception of owners that there exists a high pressure from the owners as perceived by managers in the tea sub sector in Kenya and this may perhaps influence innovation.

## Statistical Modeling

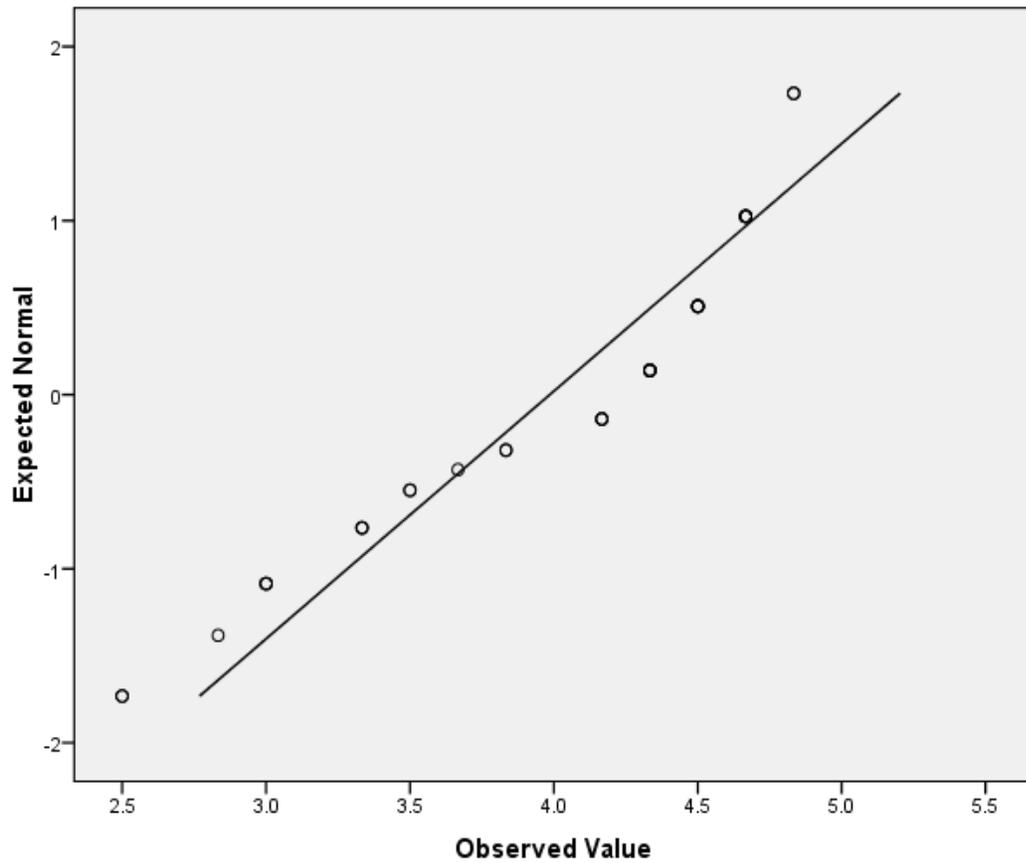
### Perception of owners normality test

Normality test was carried out to ascertain whether the data is normal and therefore assign the appropriate model for analysis. Means of Perception of owners likert scale scores were computed and tested for normality using Shapiro-Walk normality test and also validated using the Quintile - quintile plots. The Shapiro -Walk normality statistic of 0.887 with a significance of 0.002 which is less than 0.05 was found as shown in Table 4.8.

**Table 4.8: Owners' pressure normality test**

	Shapiro-Walk		
	Statistic	Do	Sig.
Perceived Owners Pressure	0.887	35	0.002

This finding implies that the data is not normally distributed. In view of this, logistic model was preferred. The key assumptions of linear regression and general linear models that are based on ordinary least squares algorithms particularly regarding normality, linearity, homoscedasticity, and measurement levels are ignorable when logit model is used. See Peng and So (2002). Furthermore, the fact that the dependent variable had been collapsed into dichotomous variable made the logistic regression model the suitable model as suggested by Hair *et al.* (1996) and Hosmer and Lemeshow (1989). The non-normality was confirmed by the Q-Q plot shown in Figure 4.7.



**Figure 4.7: Normal Q-Q plot for perception of owners**

The plot demonstrates a non-linear pattern which confirms non-normality of the data. The non-normality of the data was however ignorable as intoned earlier (Peng & So, 2002; Hair et al., 1996; Hosmer & Lemeshow, 1989).

*Comparison of means using T test*

A test to determine if there exists a relationship between innovation and perception of owners was conducted using T-test for independent samples. The T-test has been used in

the previous studies involving categorical independent variables and specifically in innovation adoption studies. See Ramsey, Ibbotson and Mccole (2008) and Shambare (2011). In this study therefore the T-test was used to compare the means scores of the perception of owners between the non-adopters and the adopters of MTH technology innovation. The means as shown in Table 4.9 of non-adopters of MTH technology was 3.393 whereas that of adopters was 4.381. The hypothesis to test was that the two means are equal.

**Table 4.9: Owners’ pressure perception group statistics**

Innovation	N	Mean	Std. Deviation	Std. Error Mean
Non adoption of MTH = 0	14	3.393	0.612	0.164
Adoption of MTH =1	21	4.381	0.432	0.094

The T-test in Table 4.10 indicates a p value of 0.000 which is less than 0.05. The hypothesis that the two means are equal is therefore rejected.

**Table 4.10: Equality of means test for perception of owners**

T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
-5.611	33	0.000	-0.98810	0.17611

The findings based on T-test of independent samples indicate that there is a relationship between perception of owners and mechanized tea harvesting technology adoption and therefore suggest that owners pressure influence mechanized harvesting technology adoption in the tea subsector in Kenya . The result is supported by Hadjimanolis (2000)

who established that owner characteristics are a determinant of innovation. The outcome also compares with Hoffman *et al.* (1998) who indicated that owner-manager leadership affects innovation. These results are also in general agreement with Hyvarinen (1990) who intoned that interest groups in whom owners are part also determine innovation.

Arising from the comparison of means using the T test, it can also be provisionally concluded that there exist a relationship between perception of owners and mechanized tea harvesting technology adoption. The facts allude to a possible influence of perception of owners on mechanized tea harvesting technology.

#### ***Logistic regression of perception of owners and mechanized harvesting technology adoption***

Logistic regression analysis was further carried out to establish the nature and the strength of association and also to determine the predictive value of the resultant model. The choice of the logistic regression was because of the categorical nature of the dependent variable of innovation. Peng and So (2002) posit that the logistic regression is appropriate in overcoming the limitations of least square regression on categorical variables. The variable was dichotomous whereby it consisted of the adopters of MTH technology and the non-adopters.

Logit model is based on a binary distribution where there are two possible outcomes. The possible outcomes in this study was defined as  $Y=0$  (Non adoption of MTH technology) or  $Y=1$  (Adoption of MTH technology).  $X$  was used to denote the vector of independent variable of stakeholder pressure perception.

Based on Košmely and Vadnal (2003), the binary logistic regression gives the probability of  $Y=1$  given  $X$  and is expressed as follows;

$$P(Y = 1|X) = \frac{1}{1 + \text{Exp}(-\beta X)}$$

By solving this equation Y, the form for the binary logistic regression model is obtained;

$$\ln \frac{(P(Y = 1|X))}{(P(Y = 0|X))} = \text{logit}(Y) = Z = \alpha + \beta X$$

For perception of owners, the model was  $\text{logit}(Y) = Z = \alpha + \beta_{OPP}X_{OPP}$  where  $\alpha$  is the constant and  $\beta_{OPP}$  is the coefficient of perception of owners variable and  $X_{OPP}$  is perception of owners rating which ranges from 1 to 5 as per the likert scale. Rating of 1 was the lowest pressure whereas 5 was the highest pressure. A Nagelkerke R square of 0.588 indicating the model's goodness of fit is shown in Table 4.11.

**Table 4.11: Model goodness of fit**

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
27.125	0.435	0.588

The Nagelkerke R square obtained implies that the model could be relied upon as predictive model for adoption of MTH technology innovation as it explains up to 58.8% of the variation. The logistic regression analysis output in Table 4.12 indicates a positive beta coefficient value of 3.043 with Wald statistic of 10.571. This is significant at 5% level of significance as p value is 0.001 which is less than the critical  $\alpha$  of 0.05.

**Table 4.12: Logistic regression analysis of Perception of owners**

	B	S.E.	Wald	Df	Sig.	Exp(B)
Perceived Owners Pressure	3.043	0.936	10.571	1	0.001	20.960
Constant	-11.649	3.768	9.555	1	0.002	0.000

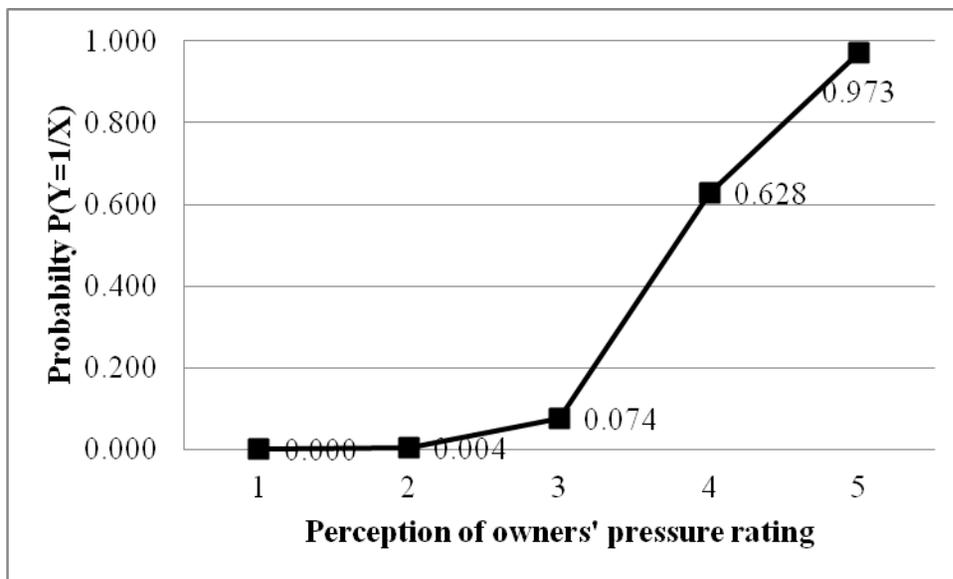
The Wald's p value was used to test the null hypothesis that perception of owners does not influence mechanized harvesting technology adoption in the tea subsector in Kenya. The hypothesis is therefore rejected and it is concluded that based on the study, perception of owners is significant and positively influences adoption of MTH technology. The results are in agreement with Brown *et al.* (2010) who established that some owners influence innovation because they may better facilitate investment choices or implementation. Also, the outcome is in consonance with Vowles, Thirkell and Sinha (2011) who established that the perceived benefits of the innovation would lead to innovation. The benefits argument further resonates well with Zakić *et al.* (2008) who opined that shareholders of the company will pursue innovation if it expects to benefit from it. Furthermore, the established relationship between perceptions of owners' pressure is in congruence with Brower and Kleinknecht (1996) who found out that the mother company of the firm can also be a determinant of innovation.

***The fitted logit model of perceived owners' pressure***

The logit model for predicting adoption of MTH technology innovation using perception of owners takes the form  $logit(Y) = Z = \alpha + \beta_{POP}X_{POP}$  and the fitted model for predicting innovation in form of adoption of MTH technology based on the model summary is thus;

$$\text{logit}(Y) = Z = -11.649 + 3.043X_{POP}$$

In order to interpret the equation of the fitted model, probabilities of adoption of MTH technology innovation given various ratings of owners' pressure was computed and presented graphically. The curve depicts a positive slope and therefore a positive relationship between perception of owners and innovation. The probability of adoption of MTH technology innovation given a high perception of owners rating of 5 is 0.973. On the other hand, the probability of adoption given a low perception of owners of 1 is 0.000 as shown in Figure 4.8.



**Figure 4.8: Perception of owners and probabilities of adoption of MTH**

The curve reaffirms the positive relationship between perception of owners and mechanized tea harvesting technology adoption. This is corroborated by the results of Baldwin and Sabourin (2000) who established that ownership has a relevant influence

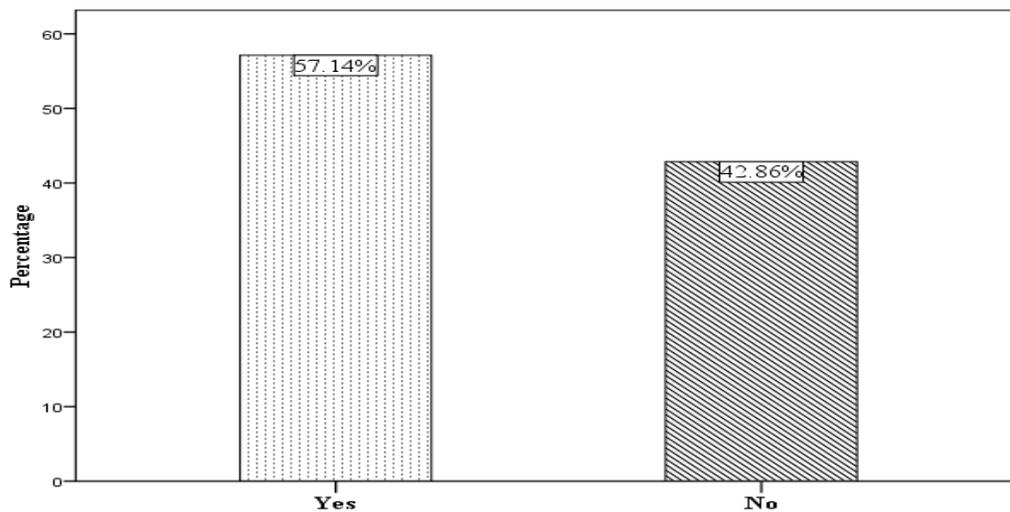
on process innovation. The outcome is also in consonance with Misoi *et al* (2015) who specifically observed that foreign owned firms have a higher likelihood to pursue innovation than local firms. It also agrees with findings of Brown *et al.* (2010) who argued that some may better facilitate innovation through investment choices or implementation. The findings also echo that of Crispi *et al.* (2007) who established that foreign owners had more experience using high technology and organizational practices.

It can therefore be transiently envisaged from the findings and the related literature that perceived owner's pressure positively influence innovation in the perspective of mechanized tea harvesting technology in the tea subsector in Kenya.

#### **4.5.3 Influence of perception of employees**

##### ***Qualitative analysis***

The study sought to establish the influence of employees' perception of stakeholder pressure on innovation as captured in form of adoption or non-adoption of MTH technology. Qualitative respondents' opinions were sought regarding whether employee pressure influenced mechanized tea harvesting technology. This was summarized in dichotomous responses of yes and no. 57.14% responded in affirmative whereas 42.86 responded in the negative as indicated in Figure 4.9.



**Figure 4.9: The respondent’s opinion on influence of employee pressure**

Those who agreed cited perceived fear of job losses as well as employment pressure by the potential employees. Also the respondents mentioned the agitation by the union who feared for possible economic backlash that could come about due to reduced employee membership numbers given that the union depends on members’ contribution. The perception mirrored the views of Hunter *et al.* (2002), who observed that if unions or worker representatives have strong influence on a wide range of strategic, technological, and work issues they are more likely to provide valuable input. The views by respondents also appear legitimate based on Kim, MacDuffie and Pil (2010) who established that workers use union voice mechanisms to present their concerns. The opinion by the respondents was further reinforced by findings by Freeman and Medoff (1984) who observed that for worker voice to be effective in influencing managerial behavior toward employees it must be collective voice.

The respondents, whose response was negative on the hand, had varied reasons. For example, those on management level felt that MTH technology was being pursued by

the organization for strategic reasons and employee pressure was least of the company's concerns. Also, they argued that employees did not fully appreciate the importance of innovation and therefore did not deem it necessary to involve them. These views are in tandem with the findings by Vowles, Thirkell and Sinha (2011) who established that the depth of technology knowledge within the adopting firm are significant influencers across multiple stages of diffusion of innovation. The negative response was also in line with Jensen (2000) who observed that employees do not have a long term interest on survival in the firm compared to shareholders. Another reason was that the management expected hostility from employees and therefore preferred ignoring the employees with regard to MTH technology. This observation by the respondents seemed to resonate well with that of Bryson (2004) who argued that union voice may sometimes be associated with adversarial industrial relations which prevent the efficient flow of information between workers and management and therefore failing to fully capture input which workers may provide.

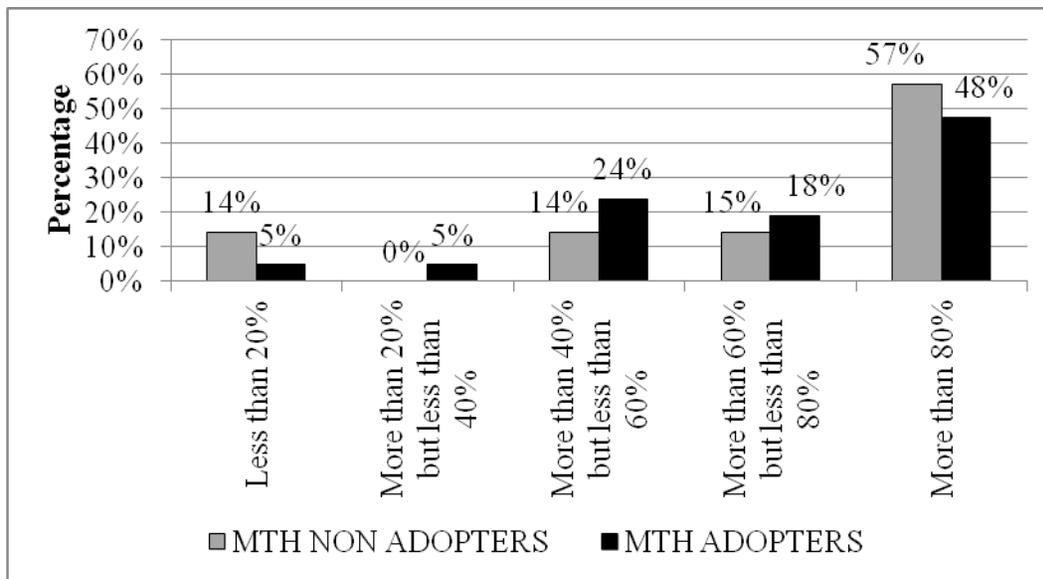
A transitory conjecture can therefore be made that since the majority of the respondents agreed that employee pressure can influence innovation in the tea subsector, there is perhaps such likelihood. This view emanates from the arguments in the aforementioned literature.

### ***Quantitative analysis***

A further measurement of employee pressure used two approaches. The first approach was membership to a trade union as done by Addison and Belfield (2004) and Wood (1996) and secondly through management perception of the employee stakeholder group attributes of power, legitimacy and urgency using a perception scale as done by Mitchel *et al.* (1997).

### ***Membership to trade union***

Membership to trade union was categorized to five groups ; less than 20%, more than 20% but less than 40%, more than 40% but less than 60%, more than 60% but less than 80% and finally, more than 80%. The results indicates firms with union membership of less than 60% were more in the MTH adopting firms than in the non-adopters ; at 34% and 28% respectively. More firms with less union membership indicate a less collective voice and vice versa. On the other hand, firms that had more than 60% union membership were more in the non-adopting firms than the MTH adopting firms which was 72% and 66% respectively as shown in Figure 4.10



**Figure 4.10: Union membership**

The findings imply that there is a stronger collective voice in the MTH non-adopting firms than in the adopting firms which may perhaps be the reason behind the decision of non adoption of MTH technology in these firms. A similar expectation arising from union membership was put forth by Freeman and Medoff (1984) who affirmed that

effectiveness of collective voice in influencing managerial behavior. Hunter *et al.* (2002) further argued that where unions have strong influence on a wide range of strategic, technological and work issues they are more likely to provide valuable input. This is expected given that union represents employees whose are mostly implementers of the innovation as observed by Zakić *et al.* (2008).

The tentative conclusion that can be drawn from the findings that show high percentage of union membership in the non adopting firms in the tea subsector and also from the existing literature is that there is a high likelihood of employee pressure that is channeled through the collective voice of the union. This has the potential to influence innovation in the context of mechanized tea harvesting technology in the tea subsector in Kenya.

#### ***Management perception of employee pressure on innovation***

The main approach of capturing management perception of the employee stakeholder group attributes of power, legitimacy and urgency was by a perception scale where respondents were requested to rate how they perception of employees based on six questions that targeted innovation related issues. A similar approach was used by Mitchel *et al.* (1997) and also measured through a perception scale. High scores of between 3 and 5 reflected a higher pressure by the employee stakeholder group whereas low scores of between 1 and 3 reflected a low pressure.

The findings on the first question in which respondents were asked about negotiation with the company show a mean rating for this question as 3.23 with 5.7% of the respondents said there was no negotiation, 22.9% said there was slight negotiation whereas another 22.9% scored somewhat. Slightly less than half of the respondents indicated moderate to a high extent of negotiation with 40.0% scoring moderate and 8.6% indicating to a great extent. With regard to if respondents felt that the employees

were regularly informed on the new developments in the company a mean rating of 4.09 was obtained. Respondents who scored “moderately” and “to a great extent” made up 74.2%. The third question which sought to establish to what extent was the employee concerns on innovation considered legitimate by the organization had a fairly high number of respondents. 34.3% and 31.4% scored “moderately” and “to a great extent” respectively. The mean rating for this item was 3.86 as indicated in Table 4.13.

The fourth question focused on how respondents perceived the company’s effort to reduce the negative impacts of new operations. The mean rating of this item was equally high at 4.2 with a combined 85.7% of the respondents scoring “moderately” and ‘to great extent’. The last two statements on joint planning with employees and mutual understanding of performance of new processes also depicted high rating of 3.80 and 3.66.

**Table 4.13: Perception of employees’ descriptive statistics**

	Not at all	Slightly	Somewhat	Moderately	To a great extent	Mean
Negotiations are undertaken with the employees or their representatives (union) on decisions of the company.	5.7%	22.9%	22.9%	40.0%	8.6%	3.23
Employees are regularly kept informed on the operational developments in the company.	0.0%	2.9%	22.9%	37.1%	37.1%	4.09
Employees’ concerns are considered legitimate in the organization.	0.0%	11.4%	22.9%	34.3%	31.4%	3.86
The company work together with employees to reduce negative impacts of operations.	0.0%	2.9%	11.4%	48.6%	37.1%	4.20
There is joint planning with employees to anticipate and resolve operational problems.	0.0%	11.4%	34.3%	17.1%	37.1%	3.80
There is development of mutual understanding between the company and employees on performance of new processes.	0.0%	8.6%	37.1%	34.3%	20.0%	3.66

The mean for all the scores was 3.8 depicting a high perceived employee pressure. Responses to the statement “Negotiations are undertaken with the employees or their

representatives (union) on decisions of the company.” indicate that management perceives employees as exhibiting some power or influence on innovation matters. This is in agreement with the views posited by Hunter *et al.* (2002) who observed that if unions or worker representatives have strong influence on a wide range of strategic, technological and work issues, they are more likely to provide valuable input on firm’s decisions. As regards the statement “Employees are regularly kept informed on the operational developments in the company.” the high rating indicating a high pressure was in line with observations by Zakić *et al.* (2008) that a firm’s ability to produce new products and services is inextricably linked to how it organizes the engagement with its main internal stakeholder who is the employee.

The statements on extent of company - employee interactions captured by the statements “The company work together with employees to reduce negative impacts of operations”, “There is joint planning with employees to anticipate and resolve operational problems.” and “There is development of mutual understanding between the company and employees on performance of new processes.” indicated also a higher than 3.0 rating which suggest a high perceived employee pressure. The statements reflects the view by Russo and Perrini (2010) who suggested that constant cultivation of close relationships with workers makes it possible to establish expectations in social relationships.

The tentative inference that can be drawn from the ratings of all the six items on perception of employees is that there exists high level of pressure as perceived by management. This suggests that a fairly high perception of employees exist in the tea subsector and this may perhaps influence the mechanized tea harvesting technology adoption.

## Statistical Modeling

### *Normality Test*

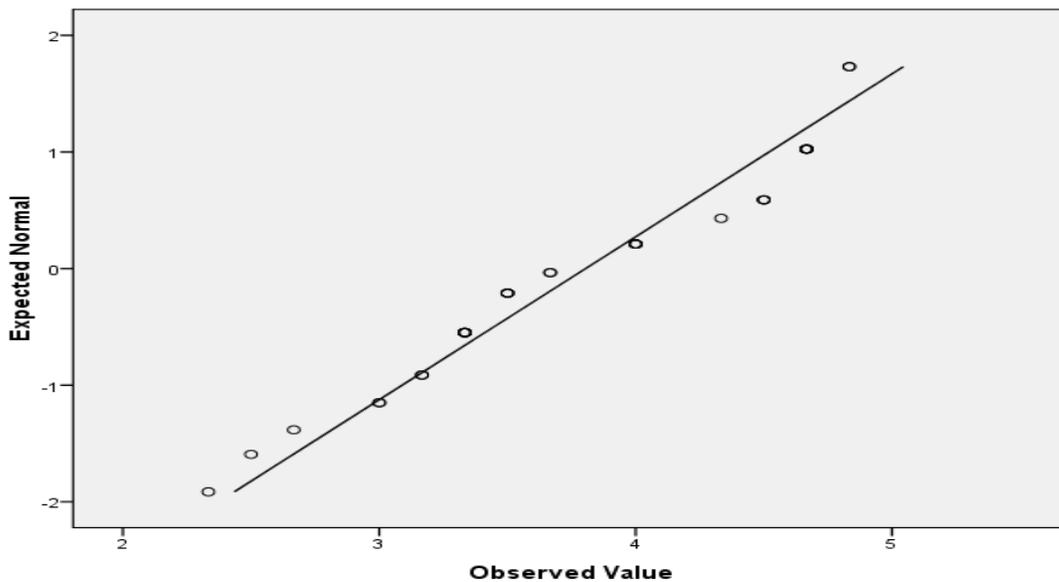
A normality test was carried out on the means of the predictor variable of perception of employees as scored in the likert scale using Shapiro-Wilk normality test to assess distribution of the data. A Q-Q plot was also used to check on the normality thus providing a validation to the Shapiro-Wilk test. The findings indicated a Shapiro –Wilk normality statistic of 0.933 with a significance of 0.034 which is less than 0.05 as shown in Table 4.14.

**Table 4.14: Perception of employees normality test**

	Shapiro-Wilk		
	Statistic	df	Sig.
Employees' pressure	0.933	35	0.034

The data therefore was not normally distributed. In view of the fact that logistic regression was the preferred model given the dichotomous nature of the dependent variable of innovation, the non- normality of the predictor variable was ignored. The decision is justified based on Hair et al, (1996) who observed that the independent variables do not need to be multivariate normal although multivariate normality yields a more stable solution. Also the residuals do not need to be multivariate normally distributed. Similar reasons for ignoring normality were also presented by Peng and So (2002) and Dayton (1992).

A Q-Q plot was also used to augment the Shapiro –Wilk normality test as demonstrated in Figure 4.11.



**Figure 4.11: Normal Q-Q plot for perceived employee pressure**

A not so linear pattern which confirms the non-normality of the variable is also evident in the Q-Q plot. This was overlooked based on similar arguments as suggested in the extant literature (Peng & So, 2002; Hair *et al.*, 1996; Dayton, 1992).

***Comparison of means using T-test for***

T-test was conducted to investigate if an association exists between the two categories of non adopters and adopters of MTH technology with regard to perceived employees' pressure. The perceived employees' pressure means of the two groups of non-adopters and adopters of MTH technology innovation were 4.18 and 3.56 respectively as shown in Table 4.15.

**Table 4.15: Perceived employees pressure descriptive statistics**

	N	Mean	Std. Deviation	Std. Error Mean
Non adopters of MTH Technology	14	4.18	0.594	0.159
Adopters of MTH technology	21	3.56	0.692	0.151

The null hypothesis that was to be tested was that the two means are equal. The T-test results in Table 4.16 show a t value of 2.757 with a p value of 0.009 which is lower than alpha of 0.05.

**Table 4.16: T test for perception of employees' pressure**

T	Sig. (2-tailed)	Mean Difference	Std. Error Difference
2.757	0.009	0.623	0.226

The findings indicate that the hypothesis that the two means are equal is rejected. The implication of this result is that there exist a significant association between innovation and perceived employees' pressure. This test is in line with causal-comparative research where attempts are made to determine the cause or consequences of differences that already exist between or among groups of individuals (Fraenkel & Wallen, 2003). The specific findings therefore indicate that Perception of employees has a relationship with mechanized harvesting technology adoption in the tea subsector in Kenya. The finding tend to follow Wu et al (2008) who observed that human capital has a mediating effect

on innovation. The established relationship between perceived employee and innovation is also analogous with those of Acs and Andretsch (1988) and Rogers (2004) who established that employee-union membership in manufacturing industry influence innovation. The findings is also in consonance with those of Hunter *et al.* (2002) who observed that if unions or worker representatives have strong influence on a wide range of strategic, technological and work issues, they are more likely to provide valuable input on firm's decisions.

It can be cautiously inferred from the findings of the T-test that perception of employees is associated with mechanized harvesting technology adoption in the tea subsector in Kenya and this association may perhaps influence the adoption of MTH technology.

***Logistic Regression Analysis for Perception of employees and mechanized tea harvesting technology adoption***

Following the confirmation of existence of some form of relationship between MTH technology adoption and perception of employees, logistic regression was carried out to further find out the manner, strength and the predictive power relationship. The non-adoption was assigned a dummy variable of 0 whereas the adoption of MTH technology was assigned a dummy variable of 1. Using the logistic model of the form;

$$\ln \frac{(P(Y = 1|X))}{(P(Y = 0|X))} = \text{logit}(Y) = Z = \alpha + \beta X$$

$Z = \alpha + \beta_{EPP}X_{EPP}$  is the linear predictor where  $X_{EPP}$  is the predictor variable of perception of employees and  $\beta_{EPP}$  is the respective coefficient and  $\alpha$  is the constant. A Nagelkerke R square of 0.248 as shown in Table 4.17.

**Table 4. 17: Perception of employees model summary**

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
40.022	0.183	0.248

The Nagelkerke R square indicates the goodness of fit of the model which means that 24.8% of the variation can be explained by model with Perception of employees as the predictor.

The regression analysis output shows a beta coefficient of -1.463. The Wald test statistic is 5.753 with a p value of 0.016 which less than the alpha value 0.05. This is presented in Table 4.18.

**Table 4.18: Logistic regression for Perception of employees**

	B	S.E.	Wald	df	Sig.	Exp(B)
Perceived employee pressure	-1.463	0.610	5.753	1	0.016	0.232
Constant	6.079	2.436	6.227	1	0.013	436.640

The negative beta coefficient indicates a negative relationship between perception of employees and MTH technology adoption. This implies that perception of employees negatively influences adoption of MTH technology. The p value that is lower than critical alpha of 0.05 indicates the relationship is also significant hence the null hypothesis that perception of employees influence innovation is therefore rejected.

These results are comparable to those of Subramaniam and Youndt (2005) who posited that human capital is negatively associated with radical innovative capacity of a firm. The position justifies observation by Chapman (2002) on the destructive behaviour of striking knitters in Nottingham while protesting the introduction of new machines. The findings however are in dissonance with that of Zerenler (2008) who established that employee capital had significantly positive relationships with innovation.

***The fitted model of Perception of employees***

The fitted logistic model based on the output of logistic regression therefore is;

$$\ln \frac{P(Y=1|X)}{P(Y=0|X)} = \text{logit}(Y) = Z = 6.079 - 1.463X_{PEP}$$

As an aid to interpretation of the model, the fitted model was used to compute probabilities of adoption of MTH technology given the different levels of perception of employees. Figure 4.11 which is a graphical presentation of the fitted model depicts a negative slope which indicates the negative relationship between perception of employees and MTH technology adoption just as indicated by the beta value of -1.403. The graph shows estimated probabilities that a firm will adopt MTH technology given various perceptions of employees rating. For example, for a low employee pressure perception of 1, the probability of a firm adopting MTH technology is 0.99 whereas for a high employee pressure perception of 5, the estimated probability of adoption of MTH technology is 0.23 as demonstrated in figure 4.12.



**Figure 4.12: Perception of employees and probabilities of adoption of MTH Technology**

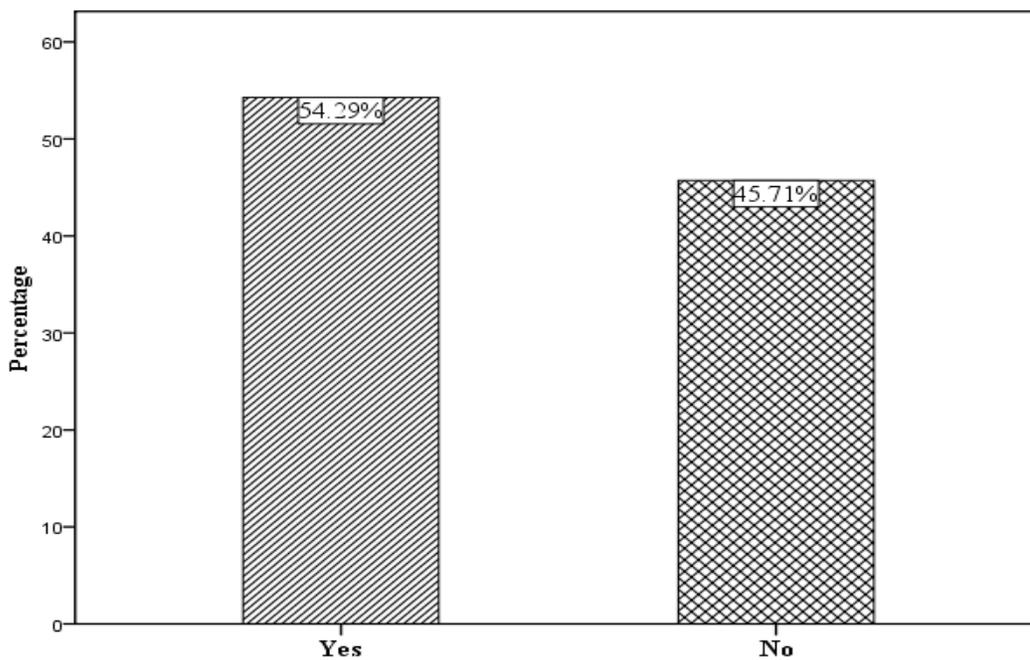
The specific findings therefore indicate that perception of employees negatively influences mechanized harvesting technology adoption in the tea subsector in Kenya. This result agrees with those of Subramaniam and Youndt (2005) who posited that human capital is negatively associated with radical innovative capacity of a firm. Also, the finding tend be in line with Jensen (2000) who observed that employees do not have a long term interest on survival in the firm compared to shareholders. The outcome also agrees with Bryson (2004) who argued that union voice may sometimes be associated with adversarial industrial relations. The findings however are in dissonance with that of Zerenler (2008) who established that employee capital had significantly positive relationships with innovation.

Provisional deduction is therefore made from the findings of the logistic regression that perception of employees negatively influences innovation in the tea subsector in the context of mechanized tea harvesting technology.

#### 4.5.4 Influence of perception of customers

##### *Qualitative analysis*

The study sought to establish the effect of perception of customers on firm's decision to pursue MTH technology innovation. Qualitative analysis was carried out on the question put the respondents on their opinion of whether customer pressure influenced the decision of the firms choice of adopting the MTH technology. The respondents were required to answer yes or no and provide reasons for their answers. 54.29 % answered yes whereas 45.71% answered no as indicated in Figure 4.13.



**Figure 4.13: Respondent's opinion on customer influence on MTH technology adoption**

The respondents who answered in the affirmative argued that customer's view was very important in that it could influence future consumption of the product. The respondents observed that this could arise if the technology could give rise to the following; if it can affect the future pricing of the product; if the process innovation could result in an inferior product; if the new operation could alter the product specifications; if the operation has an impact on safety and environment. The respondents' views are comparable with Slater and Narver (1998) who established that companies oriented to customers are responsive to final customer needs, measure their satisfaction level and improve the processes in order to satisfy customers. Slater and Narver further supports the view by intoning that orientation to the customer affects innovation since getting close to customers may detract from true innovativeness. The respondents answering in affirmative also had their views supported by Christensen (1997) who found that firms only pursued new technologies that addressed the needs of their current customers. The views are also comparable to that of Govindarajan, Kopalle and Danneels (2011) also established customer orientation has a positive impact on the introduction of radical innovations.

The respondents who did not consider pressure has influencing technology also pointed out that customers in the tea business was driven more by sustainability, safety and quality issues and not by method of harvesting. Customer pressure was deemed not to influence the decision to pursue MTH technology in situations where there was customer ignorance. This view is in consonance with Calantone, Cavusgil and Zhao (2002) empirical results who in their study of a related form of innovation, especially product innovation. They found that innovation can be detrimental to new product success if customers are not sufficiently familiar with the nature of new product.

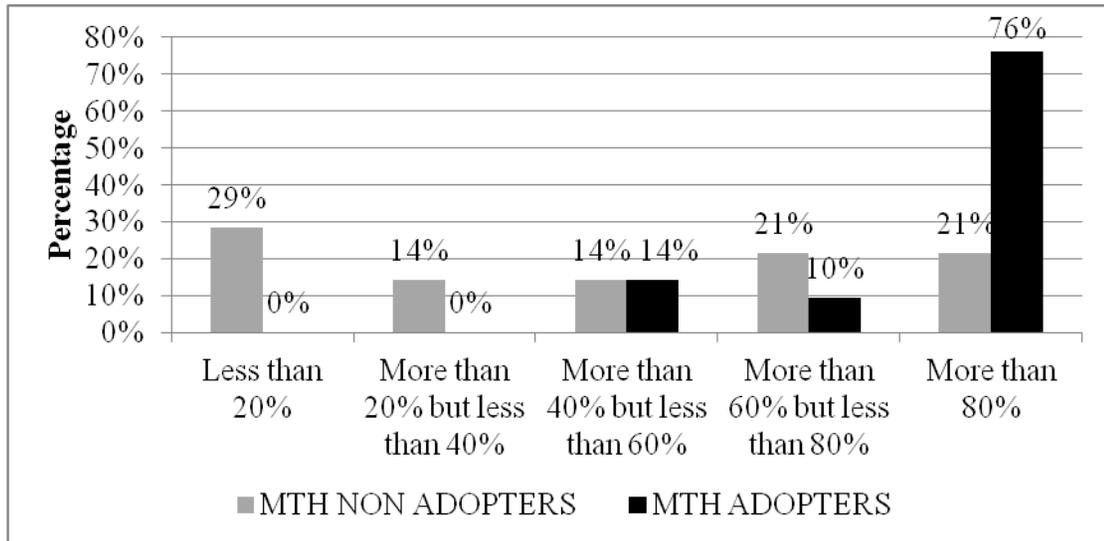
The findings show that majority of the respondents were positive in their opinion that customer influence innovation. The tentative conclusion that can be drawn from this

observation and literature is that customer pressure as a component of stakeholder group has a likelihood of influencing adoption of technology within the context of mechanized tea harvesting technology.

### ***Quantitative Analysis***

#### ***Proportion of customers insisting on certification before buying new product***

The study adopted the measure of using proportion of customers insisting certification as one of the measures of customer pressure as suggested by Delmas and Toffel (2008) who used a similar approach to measure coercive customer pressure.. The measure was further justified following (van de Wall, 2008) who observed that industry players have sometimes treated mechanically harvested product as having slight variation with the conventionally hand harvested tea product. The proportion in percentages was categorized into 5, specifically, less than 20%, more than 20 but less than 40%, more than 40% but less than 60%, more than 60% but less than 80% and more than 80%. The comparison between adopters and the non adopters of MTH indicate that the adopters of MTH had more of the firms demanding certification of new products than the non adopters of MTH. Firms indicating less than 60% customer demand for certification were more in the MTH technology non-adopting firms than the adopting firms at 57% and 14% respectively. This implies that most of the non-adopter firms did not experience customers demand for certification as compared to the adopting firms. The two categories of “more than 60% but less than 80%” and “over 80%” made a combined 86% in the MTH adopting firms compared to only 42% that made up the non-adopting firms as shown in Figure 4.14. This implies that the adopters of MTH had more of their customers demanding for certification.



**Figure 4.14: Percentage of customer demanding certification for new products**

From the findings, it is apparent that a large percentage of customers of the MTH adopting firms demand certification of new products thus therefore indicating that most firms face coercive customer pressure to have their new product certified before purchasing the products. The results are in agreement with that of Omta and Folstar (2005) who established that firm innovativeness in food firms is related to the institutional conditions existing which may include the linkages in the market chains and the ability to enter formal networks such as production-based associations. The findings which depicts a possibility of high pressure by many customers demanding certification and consequent impact on innovation is also sustained by the view of Hamel and Prahalad (1991) who observed that eagerness to serve current customers may lead coercive customer pressures which have an impact on innovation. These findings agree with Henriques and Sadorsky (1996) who an adoption study showed that customer pressure was the second most cited source of pressure in adoption of environmental management plans.

Conclusions can therefore be provisionally drawn based on the findings on the high proportion of customers demanding certification in the MTH adopting firms before buying new products and through taking cognizance of the literature and that there is likelihood for customer pressure to influence innovation in MTH technology adoption.

### ***Management perception of customer pressure on innovation***

Respondents were asked to rate in a 5 point likert scale how they perception of customers based on six questions on customer-innovation related issues. The statements on the likert scale reflected the attributes of stakeholder pressure in the context of customer pressure as perceived by managers in the tea subsector. Ratings below 3 were deemed to represent low perception of customers whereas rating above 3 was deemed to depict high perception of customers.

The extent at which customers views were taken on board with respect to innovation decisions had a mean rating of 3.83 with majority of respondents, in particular, 57.1% scoring a moderate to a high extent for the question. The frequency of which customers were informed of operational changes had a mean rating of 3.17 which is greater than 3.0. 74.3% of the respondents indicated somewhat to a high extent on this question. 74.3% of the respondents scored “moderately” to “a high extent” that customer’s views were considered in development of new products.

A low rating of 2.9 was noted in the question regarding customer entering into joint alliances with the firm with regards innovations. The findings indicated that in management opinion, customers do not enter into direct alliances for developing new technologies. A combined 54.3% of respondents felt that the firms pursue product improvement processes. The rating for the question was a high of 3.60. The respondents’ opinion on the sensitivity of the customers to changes in operational

processes reflected a rating of 3.23 with 42.9% of them scoring “moderately” to a “high extent” for the question. The import of the finding is that customers were quite interested in what operational changes can affect their product. These results are shown in Table 4.19.

**Table 4.19: Perception of customers descriptive statistics**

	Not at all	Slightly	Somewhat	Moderately	To a great extent	Mean
Customer’s views are taken on board in the decisions of organization.	0.0%	11.4%	31.4%	20.0%	37.1%	3.83
Customers are frequently kept informed on the operational developments in the company.	2.9%	28.6%	34.3%	28.6%	8.6%	3.17
Customers’ views are considered in developing new products or processes.	0.0%	2.9%	22.9%	42.9%	31.3%	4.03
Joint technology and research alliances are done with the customers.	20.0%	20.0%	17.2%	31.4%	11.4%	2.94
The company’s new processes target improved product quality.	5.7%	14.3%	25.7%	22.9%	31.4%	3.60
The customers are sensitive to changes in operational processes.	5.7%	28.5%	22.9%	22.9%	20.0%	3.23

The overall rating for perception of customers was 3.47. This indicates a higher than average level of perception of customers in the tea subsector. The implication of this is that in management opinion, customers say is considered as far as matters innovation is concerned. This observation is in line with McAdam *et al.* (2005) who posited that discovering the needs of customers is of essence to private enterprises. The findings are also in congruence with Galizzi and Venturini, (1994) who found that innovation is related to constraints from demand and conservative consumer behaviour. The findings are in consonance with Govindarajan, Kopalle and Danneels (2011) who also emphasized that customer orientation has an impact on the introduction of innovations. The management perception in this study is further supported by the earlier findings of Christensen (1997) and Christensen and Bower (1996) that firms pursued new technologies that addressed the needs of their current customers. The findings are also corroborated by Slater & Narver (1998) who posited that companies oriented to customers improve their processes in order to satisfy customers. The findings are analogous with the views of Pirsch, Gupta and Grau (2007) who opined that customers will reward firms that fulfill their needs and will actively search for goods that provide them with the rewards or experiences they seek.

A tentative conclusion can therefore be made based on literature and the rating obtained that perception of customers in the tea subsector has the potential to influence innovation as understood in the context of mechanized tea harvesting technology.

## **Statistical Modeling**

### ***Normality Test***

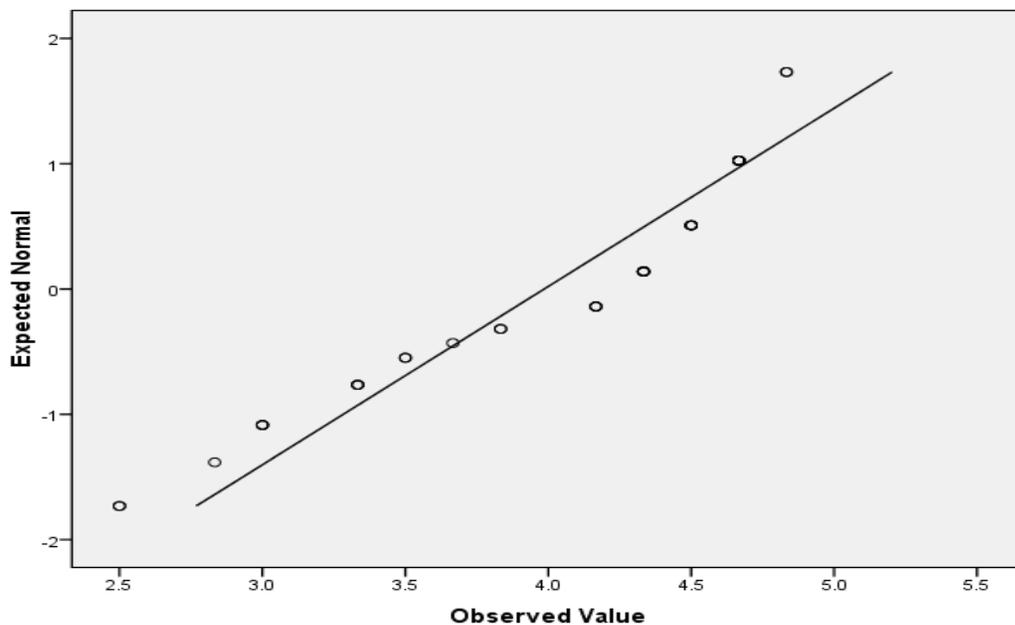
In order to choose the appropriate model for analysis of data, normality test was carried out. Shapiro-Wilk normality test was chosen for its appropriateness for small sized samples. The results indicate a Shapiro –Wilk normality statistic of 0.928 with a

significance of 0.024. This was less than to 0.05 which indicates the non-normality of data. The normality test output is shown in Table 4.20.

**Table 4.20: Perception of customers normality test**

Shapiro-Wilk			
	Statistic	Df	Sig.
Customer Pressure	0.928	35	0.024

The Q-Q plot also clearly demonstrates the non-linearity and the non-normality as demonstrated in Figure 4.15.



**Figure 4.15: Normal Q-Q plot for customer pressure**

The non-normality of the data was however ignored in view of Hair et al, (1996), Peng and So (2002) and Dayton (1992) who intoned that the independent variables do not need to be multivariate normal whenever logistic model is being used.

### *Comparison of means using T test*

A measure of association was done by comparing the means of perception of customers ratings of the two categories in the innovation variable. The mean scores for perception of customers rating in the firms that had not adopted and those that had adopted MTH technology respectively were 2.845 and 3.881. The standard deviation was 0.405 and 0.827 for the non adopters and adopters of MTH respectively. The rating therefore was more dispersed for the adopters than in the non adopters as indicated in Table 4.21.

**Table 4.21: Perception of customers group statistics**

Innovation	N	Mean	Std. Deviation	Std. Error Mean
Non Adopters of MTH = 0	14	2.845	0.405	0.108
Adopters of MTH = 1	21	3.881	0.827	0.180

T-test to compare means of adopters and non-adopters was done. The statistical hypothesis for the test was that the means from the two categories of adopters and non-adopters of MTH technology are equal. The output the test indicate a t statistic of -4.337 with a p value of 0.000 which is less than the alpha of 0.05 as shown in Table 4.22.

**Table 4.22: T test for Perception of customers**

T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
-4.337	33	0.000	-1.036	0.239

The test findings indicate that the hypothesis that the two means are equal is rejected implying that there is therefore a significant relationship between perception of customers and MTH technology innovation. The findings therefore corroborate that of Salomo *et al.* (2003) who established that customer orientation in innovation projects has influence on new product development success. It also supports Zerenler (2008) who found out that that customer capital was the greatest in influencing innovation performance and also corroborate that of Govindarajan, Kopalle and Danneels (2011) who also established that customer orientation has a positive impact on the introduction of radical innovations. An ephemeral inference can be made based on the findings from the T-test and the supporting literature relating to customer stakeholder group that perception of customers has a relationship with mechanized harvesting technology adoption in the tea subsector in Kenya. This association may perhaps influence the adoption of mechanized tea harvesting technology.

***Logistic regression of Perception of customers***

Having established the existence of association from the T-test, a logistic regression was therefore done to ascertain the nature, power and the predictive significance of the perception of customers on innovation in the context of mechanized tea harvesting technology. The logistic regression analysis was used to develop a predictive model for

innovation in MTH technology adoption given a level of perception of customers. The dependent variable was a binary variable of non-adopters and adopters of MTH technology whereby dummy variable of 0 and 1 was assigned respectively to aid in the analysis. The output of the model a -2 log likelihood of 32.363 with a Nagelkerke R square of 0.465 as shown in Table 4.23.

**Table 4.23: Model summary of Perception of customers**

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
32.363	0.344	0.465

The nagelkerke R square indicates that 46.5% of the variation in adoption of MTH technology could possibly be explained by the model. This statistic therefore signifies the goodness of fit of the model.

The binary logistic model was used to determine the nature of the relationship between Perception of customers and innovation was of the form;

$$\ln \frac{P(Y=1|X)}{P(Y=0|X)} = \text{logit}(Y) = Z = \alpha + \beta X$$

The  $Z = \alpha + \beta X$  is the linear predictor which can be substituted in the case of

Perception of customers to be;

$$Z = \alpha + \beta_{CPP} X_{CPP}$$

Where  $Z$  is natural log of the odds ratio,  $\alpha$  is the constant and  $\beta_{CPP}$  is the predictor variable coefficient and  $X_{CPP}$  is perception of customers rating. The logistic regression

outcome as shown in Table 4.24 therefore indicates a positive beta coefficient of 2.034 with p value of 0.003 which is less than the alpha of 0.05.

**Table 4.24: Logistic regression of perception of customers**

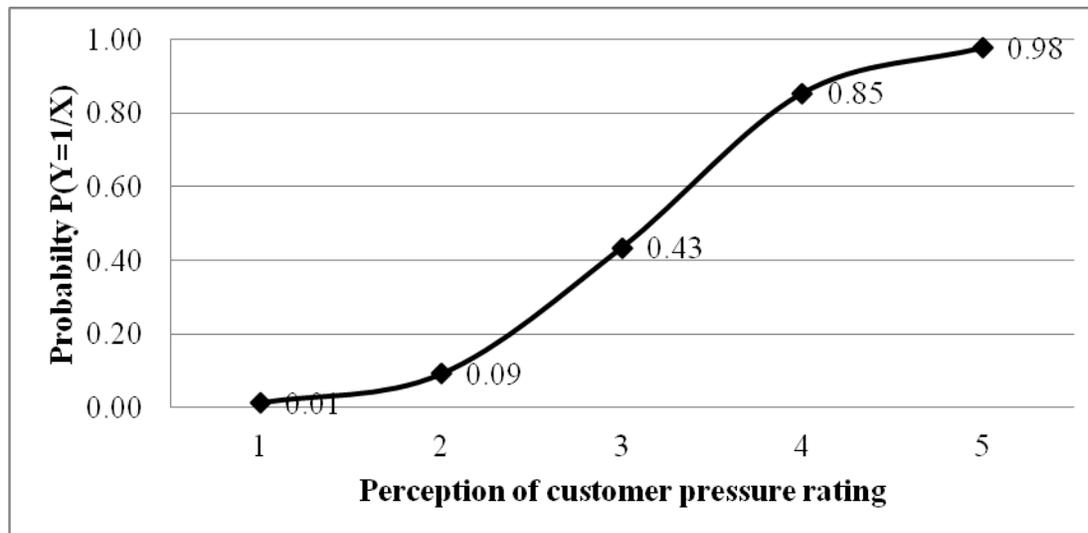
	B	S.E.	Wald	Df	Sig.	Exp(B)
Perception of customers	2.034	0.685	8.827	1	0.003	7.648
Constant	-6.364	2.233	8.123	1	0.004	0.002

This means that the perception of customers is positively significantly at 5% level of significance. The implication of this result is that the null hypothesis that perception of customers does not influence innovation is therefore rejected. The results corresponds to Salomo *et al.* (2003) who established that customer orientation in innovation has a positive influence on new product development success. It is also in agreement with Govindarajan, Kopalle and Danneels (2011) who established that mainstream customer orientation has a positive impact on the introduction of radical innovations. The findings also match those of Santos-Vijande and Alvarez-Gonzalez (2007) who found out that a firm's strong focus on customers may lead to an emphasis on innovation derived from the desire to continuously adapt to customer needs.

***The fitted model of Perception of customers***

The logistic regression analysis further provides the coefficients for fitting the predictor model. The fitted model is therefore  $Z = -6.364 + 2.034X_{CPP}$ . A graphical fitting of the model was used to determine the probability of adoption of MTH technology given a specified level of perception of customers. For example, the estimated probability of a firm that has a low perception of customers rating of 1 adopting MTH technology is 0.01

whereas the estimated probability of a firm adopting MTH technology given a high perception of customers rating of 5 is 0.98 as depicted in Figure 4.16.



**Figure 4.16: Perception of customers and probabilities of adoption of MTH Technology**

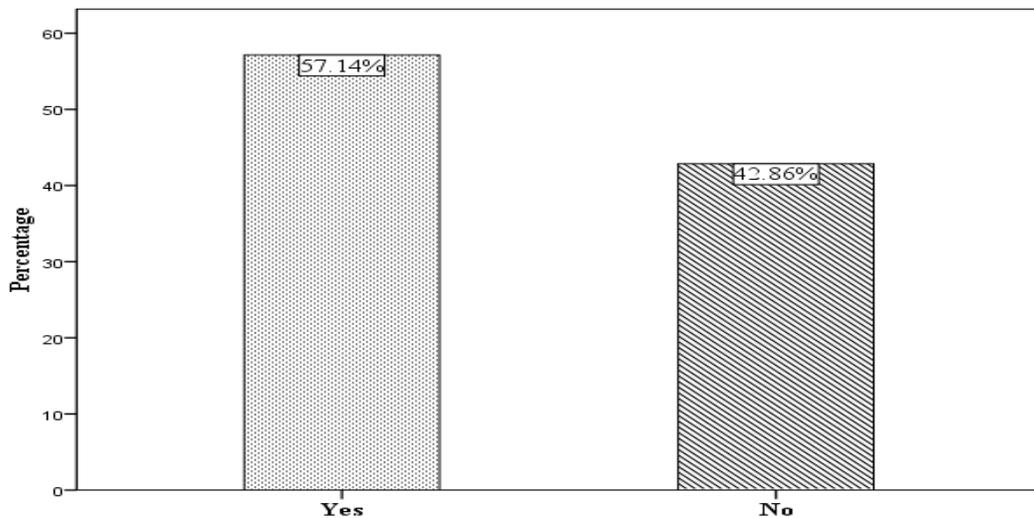
The graphical presentation shows a positive slope which validates the positive relationship that exists between perception of customers and innovation in the tea subsector in the perspective of adoption of mechanized tea harvesting technology. The obtained results of positive influence of perception of customers is further supported by Singh and Smith (2004) who concluded that a closer relationship with customers opens channels for better innovation management practices. The findings are further corroborated by Paladino (2008) who despite looking from the product innovation perspective established that the greater the market orientation causes the greater the level of innovation and new product success. The results are also in tandem with study by Bulut, Yılmaz and Alpan (2009) which investigated the interaction between customer orientation and firm innovative performance and established that customer orientation has a positive effect on firm innovative performance. A tentative conclusion can be drawn based on the findings and the supporting empirical literature that perception of

customers may positively influence mechanized harvesting technology adoption in the tea subsector in Kenya.

#### 4.5.5 Influence of community pressure perception

##### *Qualitative analysis*

The study sought to establish the relationship between community stakeholder pressure on innovation captured in form of adoption and non-adoption of MTH technology. In order to gauge the respondents' views on the influence of perception of community on innovation in the context of mechanized tea harvesting technology adoption, a dichotomous question was posed in which respondents were required to give a yes or no answer with an explanation to back up their response. A majority responded in the affirmative at 57.14% as opposed to a minority of 42.86% whose response was in the negative, this is as shown in Figure 4.17.



**Figure 4.17: Respondents' opinion of influence of community pressure**

Those who agreed that community pressure could influence adoption of the technology observed that the community is a potential source of labour and therefore the company is a source of employment. This observation by the respondents agree with Jacobs *et al.* (2013) who argued that a key external threat to success of organizational change is legitimacy erosion which in this case can arise if this need is not fulfilled. The respondents further observed that the community could present a lot of pressure at an early stage of adoption of such a technology and especially where there is a heightened political activity. This observation is consistent with Innes and Booher (2004) who established that groups who are excluded from the decision making processes are likely not to have their needs and preferences reflected in the outcomes and may bear the negative impacts of the decisions. Such negative consequences can have a potential of heightening political activism. The respondents further argued that in situations where the neighbouring community also cultivated and depended on the same cash crop as the plantation estates such that they shared in the challenges facing the industry, there was a high likelihood for the community to positively influence the adoption of the technology. In such situations the community will be pursuing innovation to reap from its benefits. The premise is supported by Johannessen (2009) who argued that adoption of innovation may lead to improved operational efficiency.

The respondents who felt that community pressure did not have any influence on innovation in the tea subsector reasoned that estates majorly had migrant labour with only a small percentage of the community forming the labour force and therefore offered minimal influence if any. Also, a large size of proximate population gave the firms opportunities for cheap labour thus countering the need for mechanization. This view is supported by Delmas and Toffel (2008) who associated the size of proximate population with ability to demonstrate collective action. The respondents further argued that in cases where firms were private entities, the community had very minimal role in

direction the firm took with regards to innovation. In situation where the community had alternate and multiple economic activities that made them not to entirely depend on economic activity of the tea plantation estates, very minimal influence was expected. In such a situation therefore, the community that do not entirely depend on tea as an economic activity may not fit into the definition of a stakeholder, a fact which resonates with Freeman (1984) defined a stakeholder as “any group or individual who can affect or is affected by the achievement of the organization’s objectives”. Tentative inference can therefore be made that there is a likelihood of influence of perception of community on innovation given that majority of the respondents answered in the affirmative and the extant literature further lends some support to that position.

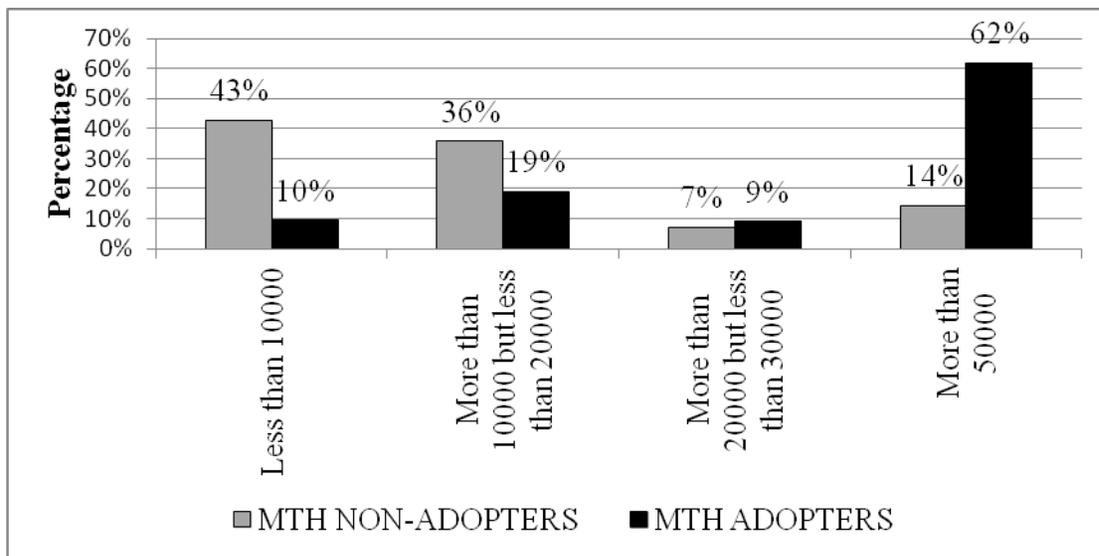
### ***Quantitative analysis***

The proportion of the population proximate to each firm was used as a proxy for a community’s propensity for collective action. Another complimentary measure was the number of job requests from the community. These measures were used to compliment the main measure of perception of community which used a perception likert scale. The perception scale focused on management perception of stakeholder attributes of power, urgency and legitimacy. Respondents were requested to give their rating to capture opinions on questions that linked community pressure with innovation issues.

### ***Proximate population***

Delmas and Toffel (2008) while proposing this indicator of proximate population had argued that it is a measure that captures propensity for collective action for the community. A comparison between firms that had not adopted and those that had adopted MTH technology with regard to the proximate population indicated that there were more firms that had not adopted MTH technology than those that had adopted the technology in area with proximate population of less 20000 at 79% and 29%

respectively. In the case where proximate population was more than 20000 people, 71% of the firms were adopters compared to 21% who were non-adopters in a similar situation as indicated in Figure 4.18 The findings imply that community collective voice was in more in area with high proximate population and may be related to adoption of MTH technology.

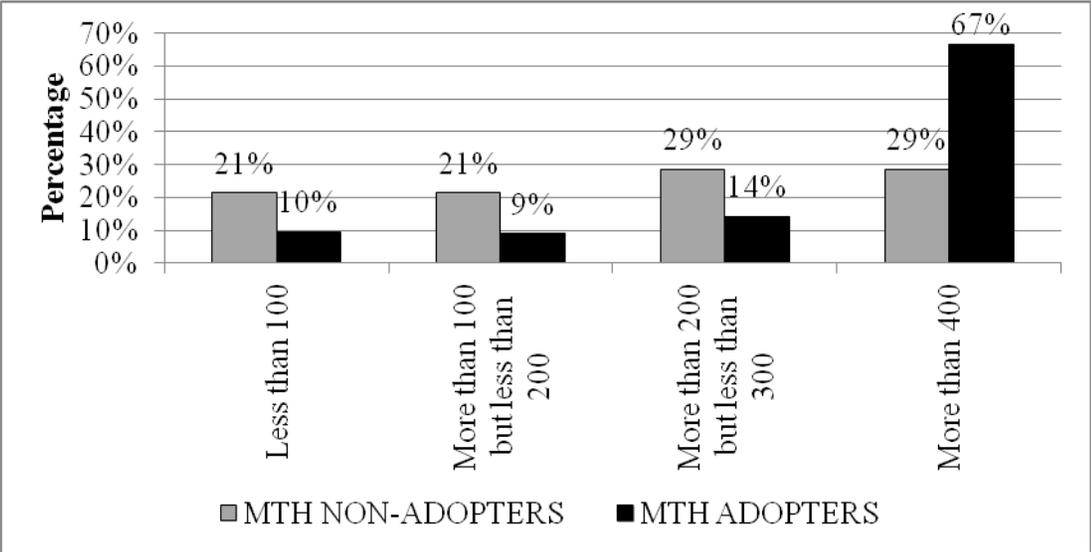


**Figure 4.18: Proximate population and MTH adoption**

Most of the MTH adopting estates had therefore a high proximate population suggesting a high community pressure in such estates compared with those of non adopting estates and based on Delmas and Toffel (2008) who argued that high proximate population was expected to present a lot of pressure since this was a reflection of the propensity to take collective action on firm’s decisions. A similar approach of measuring community pressure was pursued by Kassinis and Vafeas (2002) and Welcher *et al.* (2000).

*Approximate number of job requests*

The researcher employed job request to complement the proximate population measure. The reasoning behind this measure was that a higher proximate population could be further indicated by the number of job requests in the firm. A comparison between non-adopters and adopters of MTH technology firms in view of job requests indicate that 42% of non adopters received less than 200 job requests per year whereas 19% of adopters received similar requests. On the other hand, 58% of non adopters received over 200 job requests compared to 81% of adopters of MTH who similar requests per year as indicated in Figure 4.19. This indicates more pressure on firms that have adopted MTH technology than those that have not.



**Figure 4.19: Approximate number of job requests from the community per year**

The number of Job requests was adopted in this study to supplement the measure of proximate population. The measure was based on Delmas and Toffel (2008) propensity

for collective action where the expectation was that a high number of job request from the community represented a high level of community pressure. The measure was also supported by Sharma and Henriques (2005) who used similar approach of propensity for collective action as proxy of community pressure and found evidence that the pressure from community stakeholders is a determinant factor for innovation decision.

From the two measures which depicted a high number of proximate population and high number of job request from the community respectively on firms that have adopted MTH technology, an inference can be tentatively drawn that community pressure was most likely to influence innovation decision in the tea subsector in Kenya.

#### ***Management perception of community pressure***

A 5 point likert scale for perception of community based on six questions on community-innovation related issues was used. Ratings below 3 were deemed to represent low community pressure whereas rating above 3 was considered high. A combined 48.6% of the respondents scored “not at all” and “slightly” to the question on the extent of consultation with the community with regard to decisions on innovation. The mean rating was 2.51 which is way below mid-point of 3.0.

A Similar rating of 2.83, 2.66 and 2.80 was noted for the next three items under the community pressure stating; “The community is kept aware on the operational developments in the company.”; “To what extend do the community’s views on innovation considered as legitimate in the organization?”; “The community is sensitized in the company’s operations.”

A higher percentage of respondents particularly 68.6% and 62.9% for the questions “The company shows transparency in its managerial decisions.” and “The company shows flexibility to make adjustments in implementation plans on new processes.” were noted

resulting in a mean rating of 3.8 and 3.6 respectively as shown in Table 4.25. The overall mean of the rating for all the items in the perception of community was 2.95 which is below the midpoint of 3. The low scores indicate that the firms do not consider the community as presenting much pressure in its innovation pursuits.

**Table 4.25: Perception of community descriptive statistics**

	Not at all	Slightly	Somewhat	Moderately	To a great extent	Mean
There are consultations with the community on decisions of the company.	28.6%	20.0%	28.6%	17.1%	5.7%	2.51
The community is kept aware on the operational developments in the company.	17.1%	25.7%	28.6%	14.3%	14.3%	2.83
Community' views are considered as legitimate in the organization.	22.9%	22.9%	22.9%	28.6%	2.9%	2.66
The community is sensitized in the company's operations.	11.4%	28.6%	34.3%	20.0%	5.7%	2.80
The company shows transparency in its managerial decisions.	2.9%	25.7%	17.1%	22.9%	31.4%	3.54
The company shows flexibility to make adjustments in implementation plans on new processes.	8.6%	22.9%	17.1%	25.7%	25.7%	3.6

The results are in consonance with Guoyou, Saixing, Chiming, Haitao and Hailiang (2013), who in their study of effect of community and regulatory pressure on green product and process innovation, revealed that that community stakeholders have no significant effect on innovation. The findings are however contrary to the views of Dimmagio and Powell (1983) who pointed out that a firm may seek to accommodate the views of the society in order to achieve organizational legitimacy in its decisions. The outcome is also in dissonance with Jacobs *et al.* (2013) who found out that that a key external threat to success of organizational change is legitimacy erosion which consequently impact on organizational innovative performance. The tentative conclusion that can be inferred based on the low score and the literature is that there is a low level of perception of community and this may possibly not influence innovation in the tea subsector.

## Statistical Modeling

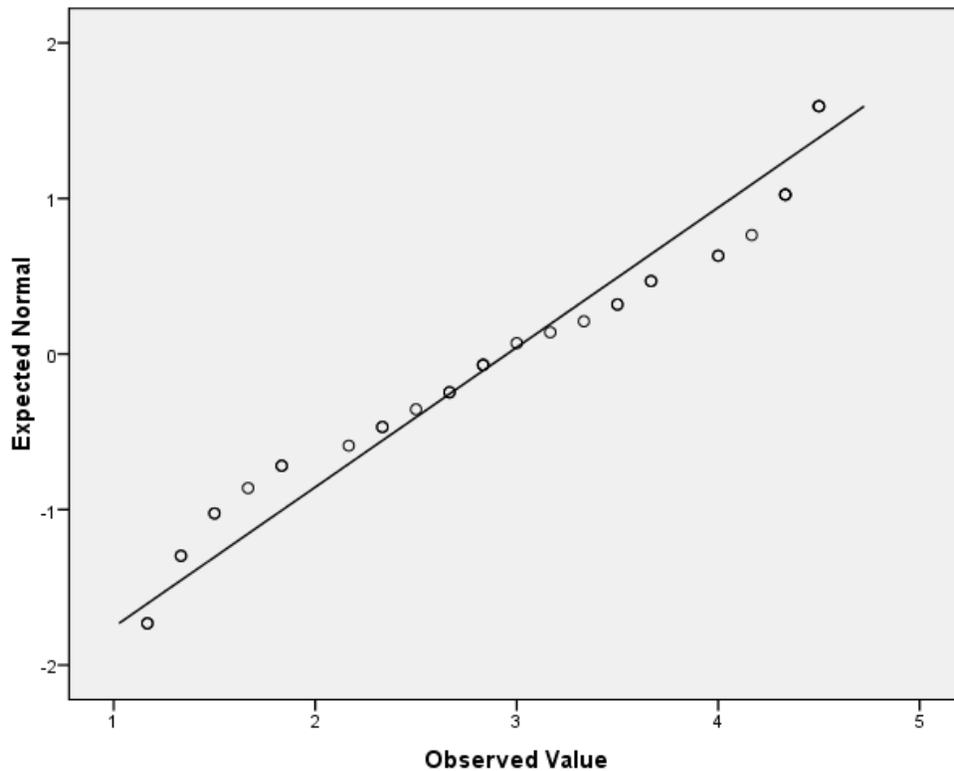
### *Normality Test*

Management perception of community pressure as scored in the likert scale was tested for normality using the Shapiro-Wilk test. This was also validated through a graphical presentation using a Q-Q plot. The Shapiro-Wilk statistic of 0.927 was obtained which was significant. The p value was 0.023 and this is less than 0.05 as depicted in Table 4.26.

**Table 4.26: Perception of community normality test**

	Shapiro-Wilk		
	Statistic	df	Sig.
Community pressure perception	.927	35	.023

The outcome means that the predictor variable of community pressure does not follow a normal distribution. The Q-Q plot also depicts a non-linear relationship and confirms the non-normality as demonstrated in Figure 4.20.



**Figure 4.20: Normal Q-Q plot for perception of community variable**

The non-normality of the data was disregarded in view of Hair et al, (1996), Peng and So (2002) and Dayton (1992) who argued that the predictor variables do not require the assumption of normality whenever logistic model is being used as is the case in this study. The logistic model was necessitated by binary nature of the dependent variable.

### *Comparison of means using T test*

T-test was done to ascertain whether there was a relationship between innovation and community pressure perception. This was achieved by comparing mean rating of perception of community between the non-adopters of MTH technology and the adopters. The mean rating was 2.631 and 3.167 for the non-adopters and adopters respectively. The rating of adopters of MTH was higher and also more dispersed as indicated in Table 4.27.

**Table 4.27: Perception of community statistics by category**

Innovation	N	Mean	Std. Deviation	Std. Error Mean
Non Adopters of MTH = 0	14	2.631	1.040	0.278
Adopters of MTH = 1	21	3.167	1.132	0.247

The statistical hypothesis that was tested was that the means of perception of community for non-adopters and adopters are not different. The t test output show a t statistic of -1.416 with a p value of 0.166 which is higher than the alpha of 0.05 as shown in Table 4.28.

**Table 4.28: T test means for perception of community pressure**

T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
-1.416	33	0.166	-0.536	0.378

This means that the two means are not significantly different from one another and therefore the hypothesis that the mean ratings for non-adopters and adopters of MTH technology is equal is accepted. The results imply that there is no relationship between perceptions of community and mechanized harvesting technology adoption in the tea subsector in Kenya.

The results agree with those of Guoyou *et al.* (2013) who revealed that community stakeholders have no significant effect on green process innovation. On the other hand, the findings are not consistent with Dimmagio and Powell (1983) who argued that a firm may seek to accommodate the views of the society in order to achieve organizational legitimacy in its decisions. Similarly, the findings are contrary to those of Hall and Wagner (2011), Henriques and Sadorsky (1996) and Sharma and Henriques (2005) who found comparative evidence that pressure from community stakeholders is a determinant factor for innovation decision.

#### ***Logistic regression of community pressure perception***

Despite the indication from the T-test that suggested absence of relationship between perception of community and innovation. The logistic regression was nevertheless done to further nature, strength of association and the predictive value of the resultant model. The dependent variable was a binary variable of non-adopters and adopters of MTH technology whereby dummy variables of 0 and 1 were assigned respectively to aid in the analysis. The summary of the model indicate a -2 log likelihood of 45.078 with a Nagelkerke R square of 0.076 as shown in Table 4.29.

**Table 4.29: Perception of community model summary**

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
45.078	.056	.076

This model summary indicates a very poor goodness of fit of the model with only 7.6% of the model explaining the relationship between community pressure and adoption of mechanized tea harvesting technology innovation.

The binary logistic model was used to determine the nature of the relationship between Perception of community and MTH technology adoption. Given the general form of the logit model;

$$\ln \frac{P(Y=1|X)}{P(Y=0|X)} = \text{logit}(Y) = Z = \alpha + \beta X$$

The model for perception of community in the linear predictor form is therefore  $Z = \alpha + \beta_{CMPP} X_{PCMP}$  where;  $Z_{CMPP}$  is natural log of the odds ratio,  $\alpha$  is the constant,

$\beta_{CMPP}$  is the predictor variable coefficient and  $X_{CMPP}$  is perception of community rating. The output of logistic regression analysis shows the beta coefficient of perception of community variable as 0.459. The Wald statistic is 1.933 with a p value of 0.164 which is higher than critical alpha of 0.05 as shown in Table 4.30.

**Table 4.30: Logistic regression of community pressure perception**

	B	S.E.	Wald	df	Sig.	Exp(B)
Community pressure perception	0.459	0.330	1.933	1	0.164	1.583
Constant	-0.926	1.006	0.847	1	0.357	0.396

This output indicate that predictor variable of perception of community has a positive effect on innovation which however is not significant at 5% level of significance. The hypothesis that perception of community does not influence innovation is thus accepted. This implies that perception of community does not influence the firm's decision to adopt MTH technology in the tea subsector in Kenya. The results in analogous with those of Guoyou *et al.* (2013) who established that community stakeholders have no significant effect on green process innovation but are contrary to Dimmagio and Powell (1983), Hall and Wagner (2011), Henriques and Sadorsky (1996) and Sharma and Henriques (2005) who found that pressure from community stakeholders is a determinant factor for innovation decision.

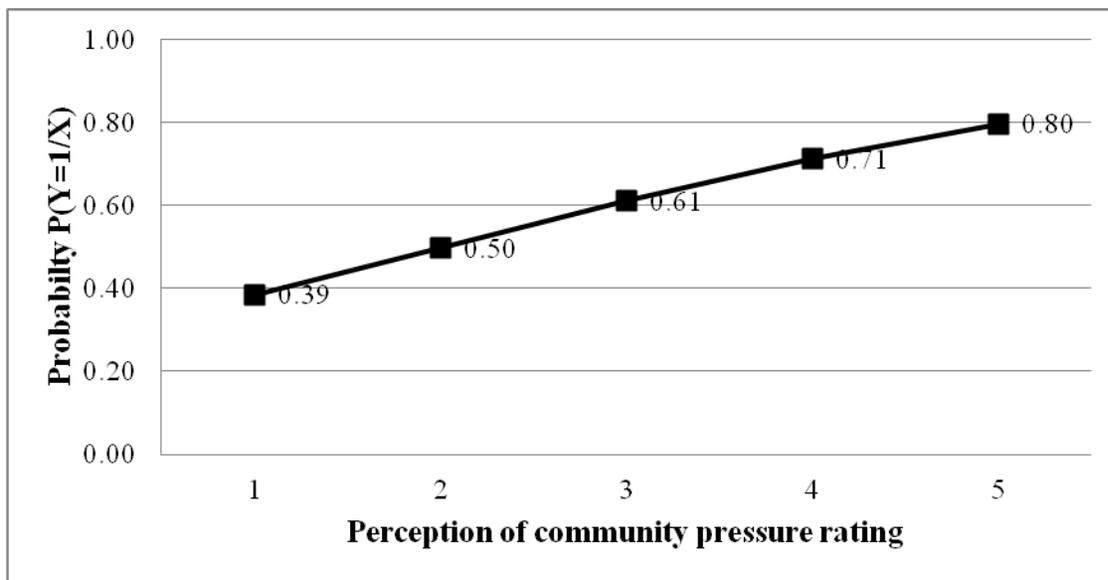
***The fitted model of community pressure perception***

Despite the non-significance of the perception of community variable, a fitted model for estimating the probabilities of adoption given the perception of community rating that follows main logistic model of the form was developed in order to further aid in interpretation of results.

The fitted model was;

$$Z = -0.926 + 0.459X_{CMP}$$

A graphical fitting of the model was therefore used to determine the probability of adoption of MTH technology given a specified level of perceived community pressure. For example, the estimated probability of a firm that has a low perception of community rating of 1 adopting MTH technology is 0.39 whereas the estimated probability of a firm adopting MTH technology given a high perception of community rating of 5 is 0.80 as depicted in Figure 4.21.



**Figure 4.21: Perception of community and probabilities of adoption of MTH**

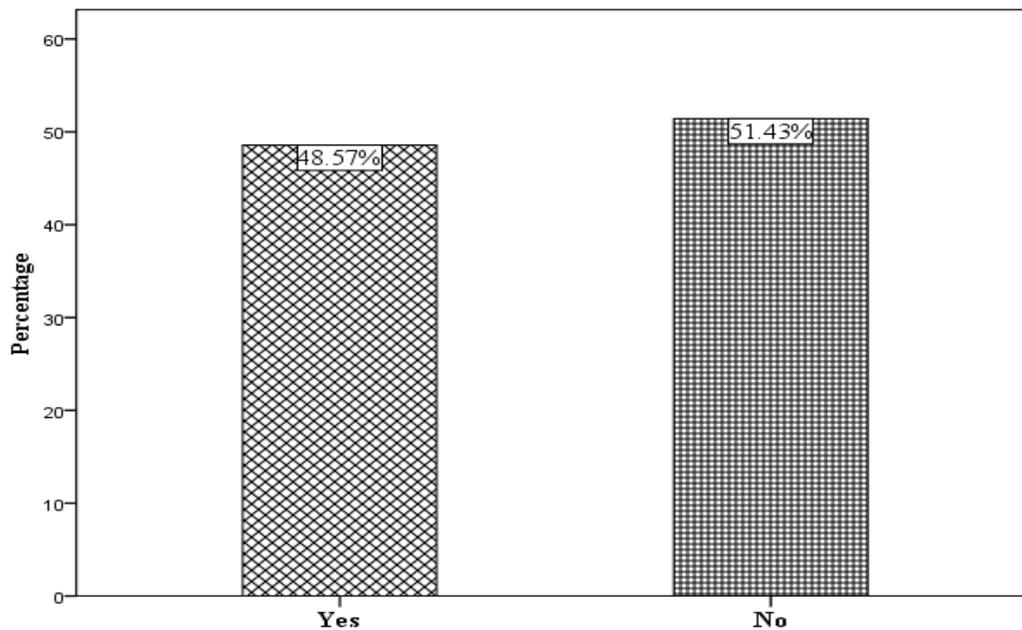
The resultant curve has a positive slope confirming the positive influence of Perception of community on innovation which however was found not significant as intoned earlier. The finding contradict Rodgers (2003) who argued that community opinion leaders play a critical role in diffusion of innovation in that they are individuals who influence others' orientation towards adopting an innovation. Also, the outcome is in dissonance with Schiavone (2012) who established that adoption of technologies that may be perceived negatively by the community may slowly be adopted or resisted altogether. The premise of the findings is also out of sync with Dimmagio and Powell (1983) who

propounded that a firm may seek to accommodate the views of the society in order to remain legitimate in its decisions and also is not consistent with Sharma and Henriques (2005) who found evidence that pressure from community stakeholders is a determinant of innovation decision. The results of the study were only found to be consistent with those of Guoyou *et al.* (2013) who established that community stakeholders have no significant effect on green process innovation. It can therefore be provisionally inferred from the non-significant beta coefficient and the poor goodness of fit of the logistic regression model and the related literature that perception of community does not influence mechanized harvesting technology adoption in the tea subsector in Kenya.

#### 4.5.6 Influence of perception of government

##### *Qualitative analysis*

The study sought to establish the influence of perception of government on MTH technology adoption in the tea subsector in Kenya. Respondents were asked to give their opinion on whether the government as a stakeholder group influenced firm's decision to pursue innovation particularly in the adoption of MTH technology. The summary of the affirmative and negative responses indicate that a minority making 48.57% felt that government as a stakeholder group influence the firms decision to pursue MTH technology whereas a majority of 51.43% held a contrary opinion as indicated in Figure 4.22.



**Figure 4.22: Respondents’ opinion on government influence**

The respondents provided reasons in support of their opinions. The respondents who assented to the view that government pressure influenced the adoption of the technology reasoned that government pressure emanated from its need to protect its policy of job creation. This view was in line with Oliver (1991) who established that government is influential in ensuring firms adhere to specific standards and failure to comply to the legal mandates may lead to non-compliance penalties, revocations of licenses or bad media publicity. The opinion also resonates with Horbach (2008) and Kemmerer (2009) who observed that regulations play a key role in innovation. The respondents who felt that government does not influence the firm’s decision however argued that the legal framework that exists does not outlaw use of MTH technology therefore allowing the plantation estates to make their own choices. The view augers well with Flammer and

Kacperczyk (2014) who opined that statutes allow firms to take into account the interests of a variety of stakeholders in carrying out their fiduciary duties to the corporation.

Provisionally, inferences can be made therefore that since the majority of the respondents responded in the negative with regards to the influence of perception of government pressure on innovation in the tea subsector, the likelihood of the government pressure influencing mechanized tea harvesting technology is therefore low.

### *Quantitative analysis*

#### *The number of inspections done by the government in the past 3 years*

Inspections done by the government was used as a complementary indicator of government pressure following Delmas and Toffel (2008) who used the same approach. The indicator complemented the main indicator which was management perception of government pressure as captured through a perception scale. The number of inspections ranged from none to more than thrice. 71.4% number of firms who had not adopted mechanized tea harvesting technology had been inspected more than once whereas cumulatively, 95.2% for those who had adopted MTH technology had been inspected more than once. 64.3% of the firms who had not adopted the MTH technology had at least been inspected three times whereas 66.7% of the adopters of MTH technology had at least been inspected three times as depicted in Table 4.31.

**Table 4.31: Number of government inspections in the past 3 years**

	None	Once	Twice	Thrice	More than thrice	Total
Non Adopters of MTH Technology	28.6%	7.1%	0.0%	28.6%	35.7%	100%
Adopters of MTH Technology	4.8%	14.3%	14.3%	9.5%	57.1%	100%

The findings indicate that more inspections had been subjected to adopting firms therefore suggesting more government pressure on firms with MTH technology. This finding was consistent with Delmas and Toffel (2008) who used inspections to gauge government pressure and established that a relationship between the adoption of innovation and government pressure existed. Delmas (2002) also used a similar approach in an adoption study and found that government was important in firms' decision to adopt ISO 14001 standards. Another study by Kassinis and Vafeas (2002) used a related approach to gauge regulatory pressure; this method measured regulatory stringency by counting the number of compliances with existing regulations and used this as a proxy for regulatory pressure.

Tentatively, it can be inferred from the findings and the foregoing literature that government pressure may have some slight influence on adoption of mechanized tea harvesting technology in the tea subsector.

### *Management perception of government pressure*

5 point likert scale was further used to assess the management perception of government pressure on innovation using government pressure and innovation related statements. The respondents were asked to score based on the extent to which they agreed with the statements. The respondents were asked to rate how they perception of government based on four questions that targeted innovation related issues. High scores of between 3 and 5 reflected a higher pressure by the employee stakeholder group whereas low scores of between 1 and 3 reflected a low government stake holder group pressure.

The respondents mean score for the question put to them regarding the extent to which the government was kept informed on operational development in the organization was 3.89 with a combined 77.1% of the respondents scoring “moderately” to “a great extent” on the likert scale. The need to keep the government aware implied that management viewed the government as a very important stakeholder group. The management opinion on the need to align the company strategy with the government policy had a high score of 4.26 with a combined 91.5% of the respondents indicating that they agreed “moderately” and “to a great extent”. The respondents’ perception on the remainder of the questions asking, “The organization goes beyond basic compliance in its operational processes.” and “The organization goes beyond basic compliance in its operational processes.” had also very high scores of 4.54 and 4.60 respectively. These results are outlined in Table 4.32.

**Table 4.32: Perception of government descriptive statistics**

	Not at all	Slightly	Somewhat	Moderately	To a great extent	Mean
The government is kept informed on the operational developments in the company.	2.9%	11.4%	20%	25.7%	40%	3.89
The company's strategy on innovation is in line with government policy.	0.0%	2.9%	20.0%	25.7%	51.4	4.26
The organization goes beyond basic compliance in its operational processes.	2.9%	0.0%	5.7%	22.9%	68.6%	4.54
The organization goes beyond basic compliance in its operational processes.	0.0%	2.9%	11.4%	8.6%	77.1%	4.60

The overall mean score for perception of government was 4.32 indicating high government pressures. This implies that government may exert pressure in firms which may perhaps influence the adoption of MTH technology. The finding is consistent with Fassin (2009) who described the government as exerting a coercive power through laws, norms and codes, and control mechanisms. The findings further justifies the views by Flammer and Kacperczyk (2014) that statutes allow firms to take into account the interests of a variety of stakeholders in carrying out their duties to the corporation. The perception further agrees with (Oliver, 1991) who

established that regulatory pressures relate to legal mandates to which organizations must comply. Failure to comply may result in penalties to the firm. It can be cautiously inferred from the findings that government pressure has a relationship with innovation in the context of mechanized tea harvesting technology in Kenya.

## **Statistical Modeling**

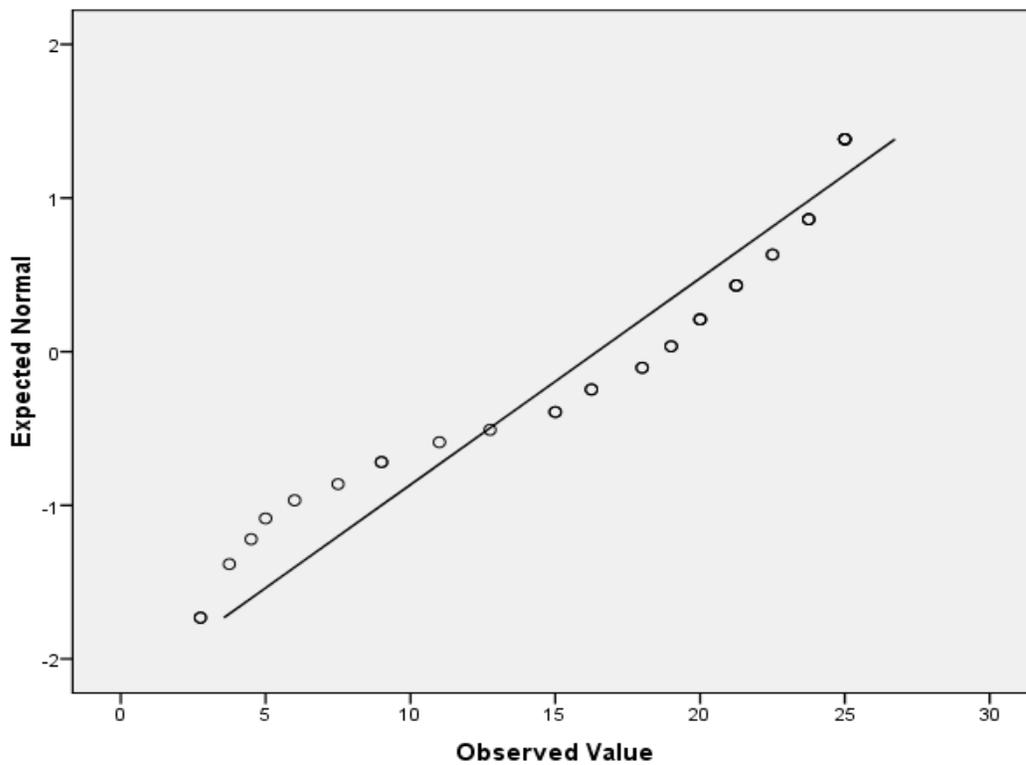
### *Normality Test*

A normality test was carried out in order to confirm the distribution of the data and therefore to assign the appropriate model for analysis of data. Shapiro-Wilk normality test was used as it was considered appropriate small sized samples. The results in Table 4.33 indicate a Shapiro –Wilk normality statistic of 0.827 with a significance of 0.000 which is less than to 0.05 indicating non-normality.

**Table 4.33: Perception of government normality test**

	Statistic	Shapiro-Wilk Df	Sig.
Perception of government	0.827	35	0.000

A Q-Q plot as shown in Figure 4.23 also depicted a nonlinear pattern thus confirming the non- normality. Logistic regression was therefore chosen as the appropriate model in line with other variables given the similarity in the data attributes.



**Figure 4.23: Normal Q-Q Plot for perception of government variable**

The non-normality of the data was disregarded in view of Hair et al, (1996), Peng and So (2002) who argued that the predictor variables do not require the assumption of normality whenever logistic model is being used as is the case in this study. The logistic model was necessitated by binary nature of the dependent variable.

### *Comparison of means using T test*

A T-test to compare the means perception of government scores between the non-adopters and adopters of MTH technology was carried out. The means for non-adopters of MTH technology was 4.27 whereas that of adopters of the MTH technology was 4.36 as shown in Table 4.34.

**Table 4.34: Perception of government statistics by category**

	N	Mean	Std. Deviation	Std. Error Mean
Non adopters of MTH Technology	14	4.27	0.7567	0.2021
Adopters of MTH technology	21	4.36	0.7482	0.1633

A T-test was carried out to establish if there was any association between the Perception of government and innovation by comparing the mean perception ratings of the adopters and non-adopters of the MTH technology. The findings indicate a p value of 0.733 which is way above alpha of 0.05 as shown in Table 4.35

**Table 4.35: T test for perception of government**

T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
-0.344	33	0.733	-0.893	0.259

The outcome shows that the two means are not different. The T-test confirms the absence of association between adopters and non-adopters of MTH technology as far as

Perception of government is concerned. The findings that perception of government pressure does not influence innovation are however contrary to those of Nameroff *et al.* (2004); Horbach (2008) and Kemmerer, (2009) who revealed that regulations play a key role in innovation. The findings are also in dissonance with observations of Fassin (2009) who described the government as having influence and exert a coercive power through laws, norms and codes, and control mechanisms. A similar study by Flammer and Kacperczyk (2014) who looked the impact of stakeholder orientation on innovation and established that government laws has a stronger impact on innovation appears also to be contrary to the findings of this study. Unlike the role government regulations play in green production innovation (Kemmerer (2009), the findings of this study indicate that such is not the case in the tea subsector in Kenya.

***Logistic regression of perception of government***

Despite the T-test indicating non-significant association between perception of government pressure and mechanized harvesting technology adoption, a logistic regression was run nonetheless to test the hypothesis that perception of government does not influence mechanized tea harvesting technology adoption in Kenya. The Nagelkerke R square is 0.005 as shown in Table 4.36.

**Table 4.36: Model summary**

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
46.986	.004	.005

The output therefore indicates a very poor goodness of fit of the model. This further confirms a very weak linkage between perception of government and adoption of the technology. The logistic regression analysis that uses the logistic model which is of the

form  $\ln \frac{P(Y=1|X)}{P(Y=0|X)} = \text{logit}(Y) = Z = \alpha + \beta X$  was developed with its linear predictor

therefore being  $Z = \alpha + \beta_{GPP} X_{GPP}$  where;  $Z$  is natural log of the odds ratio,  $\alpha$  is the constant,  $\beta_{GPP}$  is the predictor variable coefficient and  $X_{GPP}$  is the predictor variable which is the perception of government pressure rating.

The output of logistic regression analysis shows the beta coefficient 0.165 and Wald statistic of 0.125 with a p value of 0.724. This is greater than the critical alpha of 0.05 as demonstrated in Table 4.37.

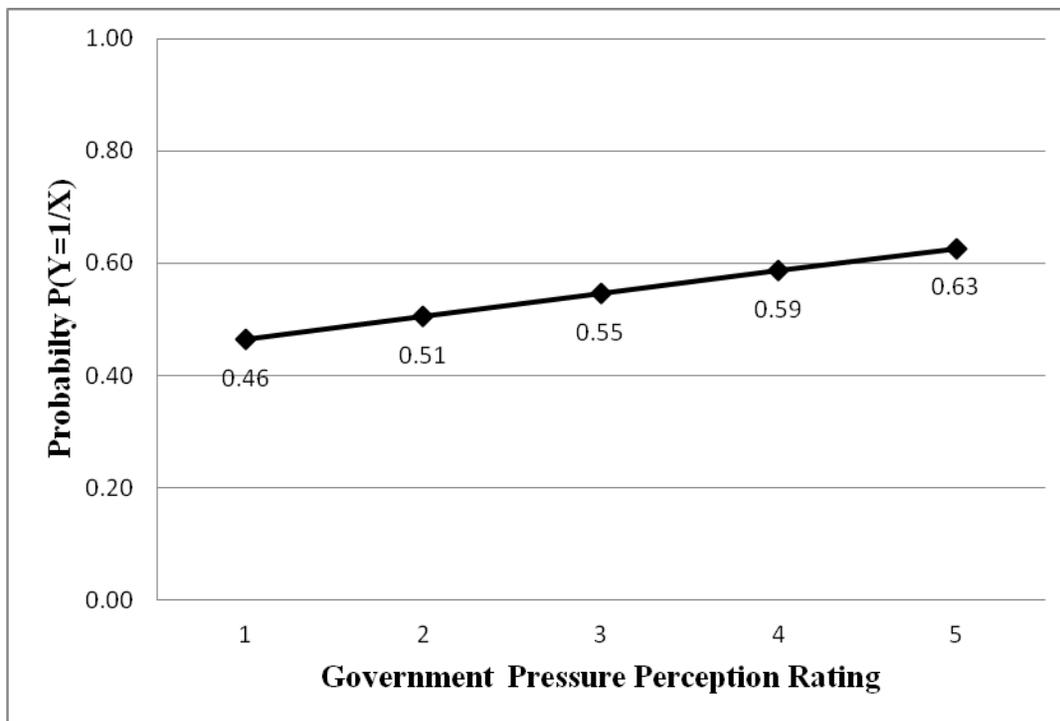
**Table 4.37: Logistic regression of perception of government**

	B	S.E.	Wald	df	Sig.	Exp(B)
Perception of government	0.165	.468	0.125	1	0.724	1.180
Constant	-0.308	2.045	.023	1	0.880	0.735

The predictor variable of perception of government is there not significant at 5% level of significance. The implication therefore is that the hypothesis that perception of government does not influence mechanized harvesting technology adoption is therefore accepted.

***The fitted model of Perception of government***

The estimated probability of adoption of MTH technology given perception of government fitted model is  $Z = -0.308 + 0.165X_{GPP}$ . The estimated probabilities of adoption of MTH technology using the fitted model given specific levels of perception of government shows that the estimated probability for adopting MTH technology is 0.46 given a low perception of government rating of 1 whereas the estimated probability of a firm adopting MTH technology given a high perception of government rating of 5 is 0.63 as demonstrated in Figure 4.24.



**Figure 4.24: Perception of government and probabilities of adoption of MTH**

It can be observed from the graph that the slope is positive, thus confirming the positive effect of government pressure as indicated earlier by beta coefficient of 0.165. This however is not significant at 5% level of significance. The results are inconsistent with those of Romijn and Albaladejo (2002) who established that institutional support is a

determinant of innovation. It is also contrary to Oerlemans, Meeus and Boekema (1998) who established that innovation is related to the existing technology policy. The findings are also contrary to those of Horbach (2008), Kemmerer (2009), Fassin (2009) and Flammer and Kacperczyk (2014) who linked government coercive pressure to firm innovation decisions. It can therefore be cautiously concluded that based on the non significant results, Perception of government does not influence mechanized harvesting technology adoption in the tea subsector in Kenya.

#### **4.5.7 Combined effect of all independent variables**

The primary objective of this study was to investigate the influence of stakeholder pressure perceptions on mechanized harvesting technology adoption in the tea subsector in Kenya. All the variables were previously tested individually to see how they contribute towards mechanized harvesting technology adoption in the tea subsector in Kenya. This section combines all the variables of perceived owners', employees', customer, community and government pressure in order to see their effects.

#### **4.5.8 Checking for multicollinearity**

Collinearity is a condition where there is a strong correlation between predictor variables. This scenario is not desirable since it makes the predictability potential of the model very unstable. Menard (2002) explained that while low level of collinearity may not compromise logistic regression model, variables that correlate at 0.8 or over will almost certainly increase standard errors. To establish if there was collinearity in the variables in question, a preliminary test using spearman correlation was carried out. The correlation matrix in Table 4.38 shows that none of the predictor variables correlated at higher than 0.8. In fact, the highest was 0.501, between perception of owners and perception of customers.

**Table 4. 38: Correlation coefficients**

		MTH					
		Adoption	EPP	CMPP	GPP	CPP	OPP
Spearman's rho	MTH ADOPT	1.000					
	EPP	-.457	1.000				
	CMPP	.249	.166	1.000			
	GPP	.079	.110	.431	1.000		
	CPP	.601	-.019	.501	.272	1.000	
	OPP	.657	-.400	.217	.099	.500	1.000

***Model Summary***

The output in Table 4.39 indicates Nagelkerke R square of 0.845 which means that there was a very strong goodness of fit of the overall model. The implication of this statistic is that the independent variables of perception of stakeholder pressure in this study largely predict innovation in the context of adoption of MTH technology in the tea subsector in Kenya.

**Table 4.39: Overall model summary (Goodness of fit)**

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
12.775	0.625	0.845

The overall logistic regression model consistently showed that the coefficients of three variables; perception of owners, perception of employees and perception of customers remained significant with p values at 0.046, 0.036 and 0.032 respectively as shown in Table 4.40. These were lower than the critical alpha of 0.05.

**Table 4.40: Logistic regression coefficients**

Independent Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Perception of owners	2.995	1.504	3.964	1	0.046*	19.992
Perception of employees	-3.300	1.572	4.409	1	0.036*	0.037
Perception of customers	2.961	1.378	4.616	1	0.032*	19.327
Community pressure perception	0.607	1.133	0.287	1	0.592	1.834
Perception of government	-0.304	1.166	0.068	1	0.794	0.738
Constant	-8.793	6.943	1.604	1	0.205	0.000

\*Significant at  $\alpha = 0.05$

Perception of owners' pressure and customers were found to positively influence mechanized harvesting technology adoption in the tea subsector in Kenya whereas perception of employees negatively influence innovation. Perception of community and government pressure was found not to significantly influence innovation in the context of MTH technology adoption. The significant variables from the overall logistic regression model were found to be consistent with the individual run models thus indicating the stability of the data.

#### 4.5.9 Revised model

The two independent variables of community pressure and government pressure were therefore dropped from the overall model and a revised logistic regression model for the three significant variables of owners, employee and customer pressure variables was run and the revised model summary indicates in Table 4.41 a Nagelkerke R square of 0.84 which means the model has a very strong predictive value on in mechanized harvesting technology adoption in the tea subsector in Kenya.

**Table 4.41: Revised model summary (Goodness of fit)**

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
13.101	0.622	0.840

*The revised model logistic regression coefficients*

The revised linear predictor model was used to develop a fitted model. The model is expressed as;

$$Z = \alpha + \beta_{OPP}X_{OPP} + \beta_{EPP}X_{EPP} + \beta_{CPP}X_{CPP}$$

Where

$Z$  is the natural log of the odds ratio of the reduced model ;  $\ln \frac{(P(Y=1|X))}{(P(Y=0|X))}$

$X_{OPP}$  is the perception of owners predictor variable,

$X_{EPP}$  is the perception of employees predictor variable,

$X_{CPP}$  is the perception of customers predictor variable,

$\alpha$  is a constant and,  $\beta_{OPP}$ ,  $\beta_{EPP}$  and  $\beta_{CPP}$  are coefficients of predictor variables of owners', employees' and perception of customers respectively.

The beta coefficients are 2.973, -3.137 and 3.021 for owners' pressure, employees' pressure and Perception of customers predictor variable respectively with corresponding p values of 0.040, 0.031 and 0.019 which are all significant since all are less than critical alpha of 0.05 as indicated in Table 4.42.

**Table 4.42: Revised Model Logistic Regression Coefficients**

Independent Variables	B	S.E.	Wald	Df	Sig.	Exp(B)
Perception of owners	2.973	1.445	4.233	1	0.040*	19.542
Perception of employees	-3.137	1.456	4.638	1	0.031*	0.043
Perception of customers	3.021	1.283	5.543	1	0.019*	20.521
Constant	-8.907	6.413	1.929	1	0.165	0.000

\*Significant at  $\alpha = 0.05$

The fitted model therefore for estimating the probabilities of adoption of MTH technology innovation with the reduced predictor variables of perceived owners, employee and customer pressure is thus;

$$Z = -8.907 + 2.973X_{OPP} - 3.137X_{EPP} + 3.021X_{CPP}$$

#### 4.6 Revised conceptual framework

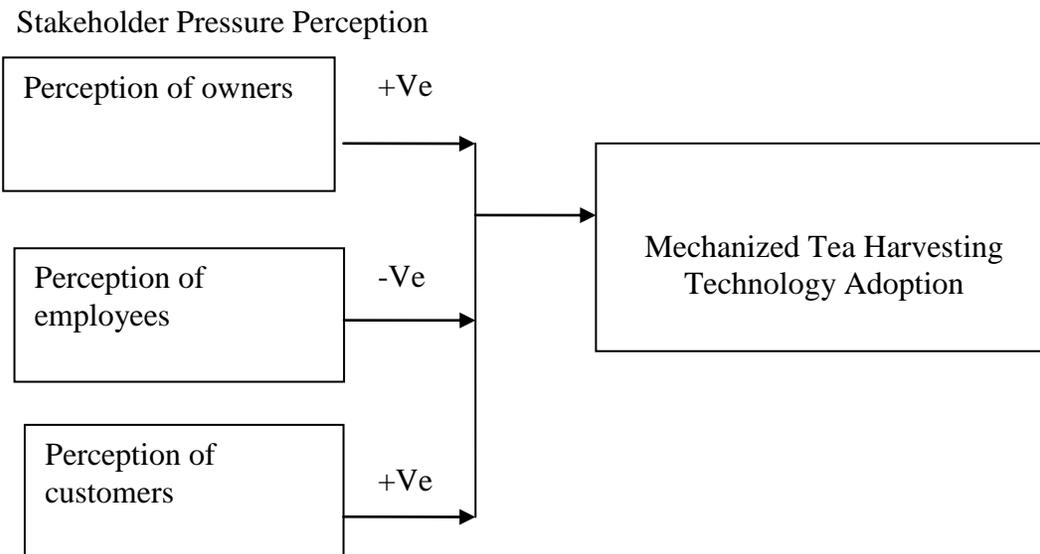
Based on the analysis of the various variables of stakeholder pressure and their relationship with innovation, the variables that did not have a significant relationship with innovation were dropped and a revised conceptual framework constructed as shown in Figure 4.25. In the revised conceptual framework, perception of owners' employees' and customers' pressure were identified as the significant variables of the stake holder pressure that influenced firm's decision to pursue innovation in the context of mechanized tea harvesting technology.

Perception of owners and perception of customers were found to positively influence innovation whereas perception of employees' pressure was identified to have a negative influence. The dropped variables were perception of community and government. From

the study therefore, owners, employees and customer stake holder groups are identified as the most powerful and influential in the decision of the firm to pursue innovation specifically in the adoption of mechanized tea harvesting technology. Strategic engagement with these groups therefore is of paramount importance to managers of the tea industry.

**Independent Variable**

**Dependent Variable**



**Figure 4.25: Revised Conceptual Framework**

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

The study sought to establish the influence of perception of stakeholder pressure on mechanized harvesting technology adoption in the tea subsector in Kenya. This chapter summarizes the results of the study based on the specific objectives. The chapter also reports on the conclusions based on the findings and give suggestions for further considerations.

#### 5.2 Summary of the findings

This section presents the summary of preliminary findings about the target population as well as that of each independent variable investigated.

##### 5.2.1 Preliminary findings

The observation units were management in charge of tea plantation estates. This comprised of top or senior management, middle level and the junior management making 25.7%, 71.4% and 2.9% respectively. The distribution of respondents' length of service was that; 62.9% had over 10 year's length of service, whereas 22.9% had worked for between 5 and 10 years. Only 14.3 percent had worked for less than 5 years. In terms of size of tea plantation estates, 14.3% were small whereas 85.7% were large. 77.1% of the tea estates had a population of over 600 employees whereas 22.9% had less than 600 employees.

##### 5.2.2 To establish how perception of owners influences mechanized harvesting technology adoption in the tea subsector in Kenya

The study sought to establish the influence of owner's pressure on mechanized harvesting technology adoption in the tea subsector in Kenya. The majority of the

respondents felt that ownership influenced innovation in the tea subsector. The study further indicated that firms that were either majorly or wholly owned by foreigners took up adoption of MTH technology more than the locally owned firms. The perception from management also showed that there exists high pressure from the owners in the tea sub sector in Kenya with regard to innovation. The statistical analysis confirmed this relationship. The T test of equality of means indicated that there is a significant difference between the non-adopters and adopters of MTH technology innovation as far as perception of owners is concerned at 5% significance level based on the p value of 0.000. This means that owners' pressure influences innovation in the context of MTH technology in the tea subsector. The results from logistic regression indicate a positive significant relationship between Perception of owners and MTH technology adoption.

The model had a goodness of fit of 58.8% since the Nagelkerke R square was 0.588 with a positive beta coefficient of 3.043 and a p value of 0.001. The p value was lower than critical alpha of 0.05. From the fitted model, the estimated probability of a firm in the tea subsector adopting MTH technology innovation given owners' pressure perception low rating of 1 is 0.00 whereas the estimated probability of a firm in the tea subsector adopting MTH technology innovation given perception of owners rating of 5 is 0.973. The conclusion on the first objective of the study therefore is that perception of owners positively influence mechanized harvesting technology adoption in the tea subsector in Kenya.

### **5.2.3 To determine how perception of employees influences mechanized harvesting technology adoption in the tea subsector in Kenya**

The study sought to establish the influence of employees' pressure on mechanized harvesting technology adoption in the tea subsector in Kenya. Findings from the qualitative responses shows that majority of the respondents agreed that employee pressure can influence innovation in the tea subsector. Membership to union which was used as a proxy of employee pressure indicated a high percentage of union

membership in the non adopting firms in the tea subsector than in MTH adopting firms therefore pointing to a relationship between employee pressure and innovation. The rating of the management perception of employee pressure on MTH technology adoption was high.

The resultant statistical modeling confirmed that indeed there existed a significant relationship between perception of employees and MTH technology adoption. The T test of equality of means indicated that there is a significant difference between the non-adopters and adopters of MTH technology innovation as far as perceived employees' pressure. The p value of 0.000 is which less than the critical alpha of 0.05 is. This means that there is a relationship between employees' pressure and innovation in the context of MTH technology in the tea subsector. The results from logistic regression depict a negative significant relationship between Perception of owners and innovation. The model had a goodness of fit of 24.8% since the Nagelkerke R square was 0.248 with a negative beta coefficient of -1.463 and a p value of 0.016. The p value was lower than critical alpha of 0.05. From the fitted model, the estimated probability of a firm in the tea subsector adopting MTH technology innovation given a perceived employees' pressure low rating of 1 is 0.990 whereas the estimated probability of a firm in the tea subsector adopting MTH technology innovation given a perceived employees' pressure high rating of 5 is 0.225. The findings therefore are that perceived employees' pressure therefore negatively influence mechanized harvesting technology adoption in the tea subsector in Kenya.

#### **5.2.4 To find out how perception of customers influences mechanized harvesting technology adoption in the tea subsector in Kenya**

The study sought to establish the influence of perception of customers on mechanized harvesting technology adoption in the tea subsector in Kenya. The majority of the respondents were positive in their opinion that customer as a component of stakeholder group influence innovation. Complimentary investigation on the customer

pressure as captured by their demand of certification of new products confirmed that firms adopting MTH technology were proportionately higher compared to that the non-adopters. The management perception as captured in the likert scale indicated a higher rating of customer pressure. The resultant T test of equality of means indicated that there is a significant difference between the non-adopters and adopters of MTH technology innovation as far as perception of customers. The obtained p value of 0.000 which is less than the critical alpha of 0.05 indicates a significant difference between the two categories. This means that there exists an association between perception of customers and innovation in the context of MTH technology in the tea subsector in Kenya.

The results from logistic regression depict a positive significant relationship between perception of owners and innovation. The model had a goodness of fit of 46.5% since the Nagelkerke R square was 0.465 with a positive beta coefficient of 2.034 and a p value of 0.003. The p value is lower than critical alpha of 0.05. From the fitted model, the estimated probability of a firm in the tea subsector adopting MTH technology innovation given a perception of customers low rating of 1 is 0.013 whereas the estimated probability of a firm in the tea subsector adopting MTH technology innovation given a perception of customers high rating of 5 is 0.978. The result therefore is that perception of customers therefore positively influence mechanized harvesting technology adoption in the tea subsector in Kenya.

#### **5.2.5 To establish how perception of community influences mechanized harvesting technology adoption in the tea subsector in Kenya**

The study sought to establish the influence of perception of community on mechanized harvesting technology adoption in the tea subsector in Kenya. The majority of the respondents responded in affirmative that community pressure affect the decision to pursue MTH technology. The indications from the measures of collective community voice of proximate population and the number of job requests was that adopters of MTH technology had a higher proximate population and job

requests thus an expectation of higher community pressure. The resultant T test of equality of means however indicated that there is also a non-significant difference between the non-adopters and adopters of MTH technology innovation as far as perception of community is concerned. The obtained p value of 0.166 which is more than the critical alpha of 0.05 indicates a non-significant difference between the two categories. This means an absence of relationship between perception of community and innovation in the context of MTH technology in the tea subsector in Kenya.

The results from logistic regression depict a positive but non-significant relationship between perception of community and innovation. The model had a poor goodness of fit of 7.6% since the Nagelkerke R square was 0.076 with a positive beta coefficient of 0.459 and a p value of 0.164. The p value is higher than critical alpha of 0.05. From the fitted model, the estimated probability of a firm in the tea subsector adopting MTH technology innovation given a perception of community low rating of 1 is 0.385 whereas the estimated probability of a firm in the tea subsector adopting MTH technology innovation given a perception of community high rating of 5 is 0.799. The disconnect between the respondents feeling could be possibly be explained by an observation of the qualitative response that most of the community surrounding the tea estates engage in similar activity of tea farming just as the tea companies hence the benefit accruing to the company from the decision to pursue MTH technology indirectly trickle to them. The result of the fourth objective therefore is that perception of community does not influence mechanized harvesting technology adoption in the tea subsector in Kenya.

#### **5.2.6 To find out how perception of government influences mechanized harvesting technology adoption in the tea subsector in Kenya**

The study sought to establish the influence of perception of government on mechanized harvesting technology adoption in the tea subsector in Kenya. The majority of the respondents responded in the negative with regards to the influence of perception of government on innovation in the tea subsector suggesting that the

likelihood of the government pressure influencing mechanized tea harvesting technology is therefore low. The outcome from the complimentary measure of government pressure using the number of government inspections indicated there may be a slight influence of government pressure on adoption of MTH technology. The management perception however indicated a high rating of government pressure. This perceived pressure did not translate any effect of innovation in MTH technology. This is confirmed by the statistical modeling. The T test of equality of means indicates that there is also a non-significant difference between the non-adopters and adopters of MTH technology innovation as far as perception of government is concerned. The obtained p value of 0.733 which is more than the critical alpha of 0.05 indicates a non-significant difference between the two groups. This implies a lack of relationship between perception of government and innovation in the context of MTH technology in the tea subsector in Kenya.

The results from logistic regression illustrate a positive but non-significant relationship between perception of government and innovation. The model had a very poor goodness of fit of 0.5% since the Nagelkerke R square was 0.005 with a positive beta coefficient of 0.165 and a p value of 0.724. The p value is higher than critical alpha of 0.05. From the fitted model, the estimated probability of a firm in the tea subsector adopting MTH technology innovation given a perception of community low rating of 1 is 0.464 whereas the estimated probability of a firm in the tea subsector adopting MTH technology innovation given a perception of community high rating of 5 is 0.626. The findings indicate that perception of government does not influence mechanized harvesting technology adoption in the tea subsector in Kenya.

### **5.3 Conclusion**

The study sought to investigate the influence of stakeholder pressure perceptions on mechanized harvesting technology adoption in the tea subsector in Kenya in the context of adoption of mechanized tea harvesting technology. This section draws

attention to the main conclusions on the five independent variables namely owners', employees', customers, community and governments pressure.

Based on previous studies, the components of stakeholder pressure were expected to have varied relation with innovation in the tea subsector Kenya. Owners' pressure was expected to be positively related with innovation. The output on this variable was in line with this expectation. Based on previous studies, owners' pressure was expected to be positively related with innovation. The output on this variable was in line with this expectation. It can be concluded that owners has have a big say with regards to innovation in this subsector and management cannot afford to ignore their opinion whenever they are considering decisions relating to innovation in the context of mechanized tea harvesting technology. The study also vindicates the resource dependency theory by Pfeffer and Salancik (1978) who argued that organizations are coalitions of varying interests and are "other directed" or controlled by those who control critical resources. Owners being the controllers of resources therefore have a major say on the strategic direction of the firm.

As regards the second variable of perceived employee pressure, the expectation from the based on the literature was a negative correlation with innovation. This expectation was based on the arguments that the fear of the job losses associated with the technology would create resistance to the change and drive the firms not to pursue the MTH technology. The findings which showed a negative and significance influence of the variable was also in line with the expectations. The study suggests that the employees' views are largely incorporated in strategic decisions especially regarding mechanized harvesting technology adoption in the tea subsector in Kenya.

Perception of customers indicated a strong positive influence on innovation of MTH technology. The findings were in consonance with earlier literature that indicated that customer views were held in high esteem by organizations pursuing innovation. The customers' views were very important in that they could influence future consumption of the product. Also such influence could arise if the technology could

give rise to the following; if it can affect the future pricing of the product; if the process innovation could result in an inferior product; if the new operation could alter the product specifications; if the operation has an impact on safety and environment.

The perception of community influence on innovation in the tea sub sector in Kenya was not significant in influencing innovation. The findings of non-significance were in dissonance with the earlier literature which envisaged a significant relationship between community and innovation. The positive relationship with innovation can however be attributed to similar economic activity of tea farming by the locals. It was observed from the study that neighbouring community also cultivated and depended on the same cash crop as the plantation estates. The community thus shared in the challenges facing the industry and identified with the benefits of the technology and likely led to positive but non- significant influence on the adoption of the technology.

Finally, the results on perception of government influence on mechanized harvesting technology in the tea sub sector revealed that though the relationship with innovation was positive, this not significant. The findings are in dissonance with past literature which suggests that government is a great supporter of innovation. The study findings therefore demonstrated that though the government supports innovation in principle, its behaviour exhibits some kind of hands off approach to mechanized harvesting technology adoption in the tea subsector in Kenya.

#### **5.4 Recommendations**

The study sought to establish the influence of stakeholder pressure perceptions on mechanized harvesting technology adoption in the tea sub sector in Kenya. Arising therefore from the study findings, the following specific recommendations are suggested. First, the finding that the perception of owners significantly influences the mechanized harvesting technology adoption in the tea subsector in Kenya confirms that this stakeholder group is critical in the adoption of the MTH technology and therefore its views must be taken on board.

Secondly, perception of employees' pressure was observed to be negatively significant therefore suggesting those firms intending to pursue MTH technology innovation must engage with this group of stakeholders and get a buy in from them. A lot of consideration must be given to employees as regards process innovation. The study recommends that since employees are a major constituent of the overall organization, obtaining their support can be of great benefit to the organization. The tea subs sector players should therefore tap into this important resource so as to obtain sustainable innovation. This could be done through training on benefits of the technology, constant consultations on the approach to mechanizations and involving employees in the design of the equipments.

Thirdly, the study affirmed the influence that customers have on organization's innovativeness. It is recommended therefore that an enhanced collaboration with customers by the tea subsector players will lead to greater levels of innovation. The final product should reflect the inputs on the processes by the customer shareholder group so that sustainability of business can be guaranteed. The customers' views could be considered in the technology design. Feedback mechanism could also be considered for customers especially on operational developments in the company. Where possible, joint technology and research alliances with the customers should be considered to ensure concerns on product quality arising from change in processes are factored in.

Fourthly, despite the fact that perception of community did not seem to significantly influence innovation, the tea subsector players should not entirely ignore the community. In fact there is need to work in collaboration given that most of the local community engages in similar economic activity of tea farming. This will ensure benefits accruing to plantation estates from innovation get to the community as well. On the other hand, since the community ultimately supplies the labour, the negative impacts of mechanization on the community economic wellbeing must always be considered. The negative effects of adopting the technology could be mitigated by the

firms pursuing CSR projects for the community and there having the necessary legitimacy in the eyes of the community.

Finally, though it is understandable that the government has role in ensuring generation of jobs, it is recommended that it must also demonstrate support for methods of sustainable business processes such as MTH innovation by offering enhanced support of the business processes through constant engagement and consultation with the tea industry players. Furthermore, the government should play provide an enabling environment by effectively playing its legislative role. It must also effectively carry out its regulatory mandate through frequent inspections.

### **5.5 Areas of further research**

The study sought to establish the influence of stakeholder pressure perceptions on mechanized harvesting technology adoption in the tea subsector in Kenya. The study looked at perception of the stakeholder pressure as perceived by estate managers thus looking at the perception from the lenses of the management. The study could therefore be further corroborated by researches that focus on perspectives of the specific stakeholder groups.

The study also limited itself to innovation in the context of process innovation and specifically mechanized tea harvesting technology yet innovation comes in various forms. Further research can therefore be pursued on how stakeholder pressure affects other forms of innovation in the tea subsector.

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## **APPENDICES**

### **Appendix 1: Questionnaire**

#### **QUESTIONNAIRE GUIDE**

This questionnaire is to collect data for purely academic purposes. The study seeks to investigate influence of stakeholder pressure perceptions on mechanized harvesting technology adoption in the tea subsector in Kenya. All information will be treated with strict confidence. Do not put any name or identification on this questionnaire.

*Answer all questions as indicated by either filling in the blank or ticking the option that applies.*

## SECTION A: BACKGROUND INFORMATION

1) Which of the following best describes your position in your organization?

Top/Senior Management

Middle Management

Junior Management

2) How long have you worked in your organization?

Less than 1 year

More than 1 year but less than 5 years

More than 5 years but less than 10 years

More than 10 Years

3) What is the size of your tea plantation estate?

Small (; Less than 200 Hectares)

Large (; More than 200 Hectares)

4) What is the number of employees in your organization?

Less than 200

200-400

400-600

[  ] 600-800

[  ] Over 800

**SECTION B: PERCEPTION OF OWNERS**

4) How would you describe your organization type in terms of shareholding?

[  ] There is no foreign shareholding ; firm is locally owned

[  ] Minority of shareholding is foreign investors

[  ] Majority of shareholding is foreign investors

[  ] Firm is a wholly owned by foreign investors

5) Do you consider the ownership type in (4) as having an influence on mechanization of tea harvesting?

[  ] Yes

[  ] No

Please explain your answer

.....  
.....  
.....

6. Mark against the box that corresponds to the extent of your agreement with the statements listed where;

Not at all -1, Slightly-2, Somewhat-3, Moderately-4, To a great extent -5

	1	2	3	4	5
Owners are kept informed on the operational decisions of the company.	<input type="checkbox"/>				
Owners participate in the running of the organization.	<input type="checkbox"/>				
Owners are knowledgeable in the company's business.	<input type="checkbox"/>				
Owners give priority to innovation issues.	<input type="checkbox"/>				
Owners view innovation as an immediate means of exploring new opportunities.	<input type="checkbox"/>				
Owners view innovation as an urgent matter to be pursued for the firm's survival.	<input type="checkbox"/>				

**SECTION C: PERCEPTION OF EMPLOYEES**

7. Do you consider employees in your organization influencing the firms' decision on whether to adopt or not to adopt mechanized tea harvesting?

Yes

No

Please explain your answer

.....

.....

.....

9) What percent are of your employees belong to a trade union?

less than 20%

More than 20% but less than 40%

More than 40% but less than 60%

[  ] More than 60% but less than 80%

[  ] More than 80%

10) Mark against the box that corresponds to the extent of your agreement with the statements listed where;

Not at all -1, Slightly-2, Somewhat-3, Moderately-4, To a great extent-5

	1	2	3	4	5
Negotiations are undertaken with the employees or their representatives (union) on decisions of the company.	<input type="checkbox"/>				
Employees are regularly kept informed on the operational developments in the company.	<input type="checkbox"/>				
Employees' concerns are considered legitimate in the organization.	<input type="checkbox"/>				
The company work together with employees to reduce negative impacts of operations.	<input type="checkbox"/>				
There is joint planning with employees to anticipate and resolve operational problems.	<input type="checkbox"/>				
There is development of mutual understanding between the company and employees on performance of new processes.	<input type="checkbox"/>				

**SECTION D: PERCEPTION OF CUSTOMERS**

11) Do you consider customers in your organization as influencing the firms' decision on whether to adopt or not to adopt mechanized tea harvesting?

[  ] Yes

[  ] No

Please explain your answer

.....  
.....  
.....

12) What is the estimated number of direct customers of the tea products in your organization?

[.....]

13) What percent of the direct customers (stated in 12 above ) insist that the firm undergoes some form of certification before buying any new tea product?

[  ] Less than 20%

[  ] More than 20% but less than 40%

[  ] More than 40% but less than 60%

[  ] More than 60% but less than 80%

[  ] More than 80%

14) Do you consider demand by the customers for certification as influencing the adoption of mechanized tea harvesting?

[  ] Yes

[  ] No

Please explain your answer

.....  
.....  
.....

15) Mark against the box that corresponds to the extent of your agreement with the statements listed where;

Not at all -1, Slightly-2, Somewhat-3, Moderately-4, To a great extent-5

	1	2	3	4	5
Customer's views are taken on board in the decisions of organization.	<input type="checkbox"/>				
Customers are frequently kept informed on the operational developments in the company.	<input type="checkbox"/>				
Customers' views are considered in developing new products or processes.	<input type="checkbox"/>				
Joint technology and research alliances are done with the customers.	<input type="checkbox"/>				
The company's new processes target improved product quality.	<input type="checkbox"/>				
The customers are sensitive to changes in operational processes.	<input type="checkbox"/>				

**SECTION E: PERCEPTION OF COMMUNITY**

16) Do you consider the community around your organization as influencing the firms' decision on whether to adopt or not to adopt mechanized tea harvesting?

[  ] Yes

[  ] No

Please explain your answer

.....

.....

.....

17) Do you consider the size of population of the community proximate to your organization as influencing your decision on the adoption of mechanized tea harvesting technology?

Yes

No

Please explain your answer

.....  
.....

18) What is the estimated population of community around your organization?

Less than 10000

More than 10000 but less than 20000

More than 20000 but less than 30000

More than 30000 but less than 40000

More than 40000

19) What is the approximate number of job requests you receive from the community per year?

Less than 100

More than 100 but less than 200

More than 200 but less than 300

More than 300 but less than 400

[  ] Over 500

20) Mark against the box that corresponds to the extent of your agreement with the statements listed where;

Not at all -1, Slightly-2, Somewhat-3, Moderately-4, To a great extent-5

	1	2	3	4	5
There are consultations with the community on decisions of the company.	<input type="checkbox"/>				
The community is kept aware on the operational developments in the company.	<input type="checkbox"/>				
Community' views are considered as legitimate in the organization.	<input type="checkbox"/>				
The community is sensitized in the company's operations.	<input type="checkbox"/>				
The company shows transparency in its managerial decisions.	<input type="checkbox"/>				
The company shows flexibility to make adjustments in implementation plans on new processes.	<input type="checkbox"/>				

**SECTION F: PERCEPTION OF GOVERNMENT**

21) Do you consider the government as influencing the firms' decision on whether to adopt or not to adopt mechanized tea harvesting?

[  ] Yes

[  ] No

Please explain your answer

.....  
.....

22) How many inspections on your operations (including tea harvesting operations) have government or affiliate regulatory bodies done in the past 3 years in your organization?

[  ] None

[  ] Once

[  ] Twice

[  ] Thrice

[  ] More than thrice

24) Mark against the box that corresponds to the extent of your agreement with the statements listed where;

Not at all -1, Slightly-2, Somewhat-3, Moderately-4, To a great extent-5

	1	2	3	4	5
The government is kept informed on the operational developments in the company.	<input type="checkbox"/>				
The company's strategy on innovation is in line with government policy.	<input type="checkbox"/>				
The organization goes beyond basic compliance in its operational processes.	<input type="checkbox"/>				
The company complies with government policy regarding innovation.	<input type="checkbox"/>				

**SECTION G: MECHANIZED TEA HARVESTING TECHNOLOGY ADOPTION**

25) What percentage of the tea area has been put under mechanized tea harvesting technology?

(.....) %

26 a) What was the total tea volume produced in Greenleaf Kgs in the past five years?

Year	2010	2011	2012	2013	2014
Total tea production (Greenleaf)					

b) What was the tea volume produced under mechanized harvesting technology?

Year	2010	2011	2012	2013	2014
Total tea production under mechanized harvesting technology					

27) What percent of the research and development budget relates to mechanized tea harvesting technology in your organization?

(.....) %

.....End of Questionnaire.....

## Appendix 2: Plantation Estates List

<b>KENYAN TEA PLANTATION ESTATES LIST</b>		
	<b>NAME</b>	<b>COUNTY</b>
1	Siret Tea Estate	NANDI
2	Kepchomo Tea Estate	NANDI
3	Kapsumbeiwa Tea Estate	NANDI
4	Kipkoimet Tea Estate	NANDI
5	Chemomi Tea Estate	NANDI
6	Savani Tea Estate	NANDI
7	Kibwari Tea Estate	NANDI
8	Kibabet Tea Estate	NANDI
9	Sitoi Tea Estate	NANDI
10	Kaboswa Tea Estate	NANDI
11	Kipkeibon Tea Estate	NANDI
12	Sara Boit Tea Estate	NANDI
13	Changoi Tea Estate	BOMET
14	Tinderet Tea Estate	NANDI
15	Kaimosi Tea Estate	NANDI
18	Kapchorua Tea Estate	NANDI
19	Kitumbe Tea Estate	BOMET
20	Changana Tea Estate	BOMET
21	Kimulot Tea Estate	BOMET
22	Maramara Tea Estate	KERICHO
23	Chomogondany Tea Estate	KERICHO
24	Saosa Tea Estate	KERICHO
25	Kipchabo Tea Estate/Factory	NANDI
26	Chebango Tea Estate	BOMET
27	Kapcheluch Tea Estate	KERICHO
28	Mau Tea Estate	KERICHO
29	Kaisugu Tea Estate	KERICHO
30	Lasit Tea Estate	NAKURU
31	Olunguruone Tea Estate	NAKURU
32	Orgirgir Tea Estate	NANDI
33	Nandi Tea Estate	NANDI
34	DL Koisagat Tea Estate	NANDI
35	Mogobich Tea Estate	NANDI
36	Kiborgok Tea Estate	NANDI
37	Mogeni Tea Estate	NYAMIRA
38	Kipsinende Tea Estate	UASIN GISHU
39	Karirarana	KIAMBU
40	Maramba	KIAMBU
41	Ngorongoro	KIAMBU
42	Mabroukie	KIAMBU
43	Kipsonoi Tea Estate	KERICHO
44	Kiptagich Tea Factory	NAKURU
45	Kerirtor Tea Estate	NYAMIRA
46	Kipkebe Tea Limited	NYAMIRA
47	Arroket Tea Estate	BOMET
48	Mettarora Tea Estate	NYAMIRA
49	Kapgwen Tea Estate	BOMET
50	Kimugu Tea Estate	KERICHO
51	Kericho Tea Estate	KERICHO
52	Jamji Tea Estate	KERICHO
53	Chebown Tea Estate	KERICHO
54	Koiwa Tea Estate	BOMET
55	Limuru Tea Estate	KIAMBU

Source: Tea Directorate

### Appendix 3: Summary of Qualitative Responses

		Yes	No
1	Influence of perceived owners pressure	<ul style="list-style-type: none"> <li>• True where objective of organization is to provide Jobs-locally owned</li> <li>• Fast decision making is guaranteed where it is local</li> <li>• Overall strategy of the foreign firm is mechanization to reduce costs</li> <li>• Globally it is gaining currency</li> <li>• Foreign investors always look at improving technology</li> <li>• Foreign companies have been piloting innovations in search of best ways to do business</li> </ul>	<ul style="list-style-type: none"> <li>• Decisions done by locals</li> <li>• Sound business decision irrespective of ownership type</li> <li>• Lack of knowledge on MTH by local firms hence low pressure</li> </ul>
2	Influence of perceived employee pressure	<ul style="list-style-type: none"> <li>• Fear of perceived job losses</li> <li>• Employment pressure</li> <li>• On management level for strategic reasons</li> <li>• Union fears of losing numbers hence economic base</li> <li>• At initial stage of introduction</li> </ul>	<ul style="list-style-type: none"> <li>• Strategic decision of shareholders carry the day</li> <li>• Employee inputs are not taken on board expected hostility</li> <li>• Employee do not fully appreciate the importance of innovations</li> </ul>
3	Influence of Perception of customers	<ul style="list-style-type: none"> <li>• Influence pricing</li> <li>• If process innovation tends to lead to inferior product</li> <li>• Expectation by customers is that MTH leads to inferior product</li> <li>• Operation must ensure it suits their demands/product specification.</li> <li>• Concern of safety and environment issues of MTH</li> </ul>	<ul style="list-style-type: none"> <li>• Customer ignorance</li> <li>• Driven by quality not method of harvesting</li> <li>• Driven by sustainability issues</li> <li>• Customer pressure is on welfare issues/safety</li> <li>• Offering of static price by customers</li> <li>• Certification is based on existing operation.</li> <li>• Not decision makers</li> <li>• Firms that lack technical know- how lend minimal pressure</li> </ul>
4	Influence of community pressure perception	<ul style="list-style-type: none"> <li>• Source of labour</li> <li>• Where community view the company as source of employment</li> <li>• Only at introductory stage</li> <li>• Political nature where there is perceived job losses.</li> <li>• Where surrounding community also depends on the same cash crop, support for technology is expected due to benefit.</li> </ul>	<ul style="list-style-type: none"> <li>• Where labour is migrant and local community is a small % pressure from community is minimal.</li> <li>• Where firm is a private entity, no role of community</li> <li>• Large size of proximate population may provide cheap labour.</li> <li>• Where the community has multiple economic activities (size included)</li> </ul>
5	Influence of Perception of government	<ul style="list-style-type: none"> <li>• Can result in job losses-against government policy to create jobs</li> <li>• Where there is no political goodwill for MTH</li> </ul>	<ul style="list-style-type: none"> <li>• Innovation as way forward</li> <li>• Legally allowed to use technology</li> <li>• MTH has not been outlawed</li> </ul>

#### Appendix 4: Statistical Summary of Predictor Variables

	Perceived Owners' Pressure*	Perceived Employee Pressure*	Perception of customers*	Perception of community	Perception of government
<b>T-test</b>					
Coefficient	<b>-5.611</b>	<b>2.757</b>	<b>-4.337</b>	-1.416	-0.344
p values	<b>0.000</b>	<b>0.009</b>	<b>0.000</b>	0.166	0.733
SE	0.176	0.226	0.239	0.378	0.259
<b>Logit Regression</b>					
Beta Coefficient	<b>3.043</b>	<b>-1.463</b>	<b>2.034</b>	0.459	0.165
p values	<b>0.001</b>	<b>0.016</b>	<b>0.003</b>	0.164	0.724
SE	<b>0.936</b>	<b>0.610</b>	<b>0.685</b>	0.330	0.468
<b>Goodness of fit</b>					
Nagelkerke R <sup>2</sup>	<b>0.588</b>	<b>0.248</b>	<b>0.465</b>	0.076	0.005
<b>Perceived Stakeholder Pressure</b>					
Mean Likert Scale Rating (m)	<b>3.99</b>	<b>3.80</b>	<b>3.47</b>	2.95	4.32
<b>Estimated Probabilities</b>					
<b>P(Y=1/X)</b>					
P(Y=1/X), X=m	<b>0.621</b>	<b>0.627</b>	<b>0.667</b>	0.605	0.600
P(Y=1/X), X=1	<b>0.000</b>	<b>0.990</b>	<b>0.013</b>	0.385	0.464
P(Y=1/X), X=5	<b>0.973</b>	<b>0.225</b>	<b>0.978</b>	0.799	0.626

\*The significant predictor variables

## Appendix 5: Factor Loadings

### Perception of owners factor loadings

Item	1
Owners are kept informed on the operational decisions of the company.	0.528
Owners participate in the running of the organization.	0.936
Owners are knowledgeable in the company's business.	0.633
Owners give priority to innovation issues.	0.779
Owners view innovation as an immediate means of exploring new opportunities.	0.881
Owners view innovation as an urgent matter to be pursued for the firm's survival.	0.698

### Perception of employees factor loading

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Item	Component 1
Negotiations are undertaken with the employees or their representatives (union) on decisions of the company.	0.755
Employees are regularly kept informed on the operational developments in the company.	0.903
Employees' concerns are considered legitimate in the organization.	0.824
The company work together with employees to reduce negative impacts of operations.	0.639
There is joint planning with employees to anticipate and resolve operational problems.	0.899
There is development of mutual understanding between the company and employees on performance of new processes.	0.453

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Extraction	Method:	Principal	Component	analysis
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### Perception of customers factor loadings

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Item	Component 1
To what extent are customer's views taken on board in the innovation decisions of the organization?	0.884
Customers are frequently kept informed on the operational developments in the company.	0.723
Customers' views are considered in developing new products or processes.	0.879
Joint technology and research alliances are done with the customers.	0.580
The company's new processes target improved product quality.	0.732
The customers are sensitive to changes in operational processes.	0.385

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Extraction Method: Principal Component Analysis.

### Perception of community factor loadings

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Item	Component 1
There are consultations with the community on decisions of the company.	0.939
The community is kept aware on the operational developments in the company.	0.918
To what extend do the community's views on innovation considered as legitimate in the organization?' vi	0.825
The community is sensitized in the company's operations.	0.817
To what extend does the company show transparency in its managerial decisions	0.876
The company shows flexibility to make adjustments in implementation plans on new processes.	0.767

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### Perception of government factor loading

Items	Component
To what extent are legal requirements a limitation to decisions of the company with regard to operational strategies?	0.393*
To what extent is the government is kept informed on operational developments in the company?	0.879
The company's strategy on innovation is in line with government policy.	0.747
The organization goes beyond basic compliance in its operational processes.	0.949
Does the organization actively consult government/regulatory bodies in developing innovation policies?	-0.347*
The organization goes beyond basic compliance in its operational processes.	0.949

Extraction Method: Principal Component analysis

\*Dropped items

### Appendix 6: Mechanized Harvesting Adoption Data

Respondent	Percentage MTH by Area	Percentage MTH by Volume	Transformed MTH Adoption to Binary Variable
1	0	0	0
2	8	71	1
3	0	0	0
4	0	0	0
5	0	0	0
6	62	69	1
7	0	0	0
8	16	6	1
9	100	100	1
10	0	0	0
11	70	77	1
12	0	0	0
13	65	55	1
14	78	70	1
15	0	0	0
16	60	54	1
17	0	0	0
18	0	0	0
19	0	0	0
20	50	51	1
21	0	0	0
22	20	20	1
23	45	47	1
24	40	39	1
25	45	46	1
26	50	50	1
27	40	41	1
28	60	65	1
29	68	70	1
30	63	61	1
31	60	53	1
32	60	68	1
33	52	50	1
34	0	0	0
35	0	0	0