G.J.I.S.S.,Vol.5(6):14-20 *(November-December, 2016)* **ISSN: 2319-8834**

GLOBAL JOURNAL OF INTERDISCIPLINARY SOCIAL SCIENCES
*(**Published By**: Global Institute for Research & Education)*

www.gifre.org

Mechanical Tea Harvesting and Its Challenges on Employee Productivity in Kericho Tea Estates, Kenya

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Abstract

The wave of globalization the world over has been driven by policies that have opened economies domestically and internationally. Globalization exerts pressure on human resource function to adapt to changing organizational needs and add greater value. It is driven by several factors which include: advances in technology, accelerated production, increased mobility of people and products, liberalization of capital markets and the global harmonization of the regulatory environment. The transfer and adoption of technology in tea sector is of paramount importance to assuring a reliable supply of high quality products at prices that are both profitable to producers and reasonable to consumers. Tea firms are embracing new technology through implementation of mechanical tea harvesters, replacing hand picking. In spite of the anticipated benefits that have been associated with this form of technology, there are however some challenges that are associated with it. This study therefore sorts to examine the challenges facing tea estates in implementing Mechanical Tea Harvesters using one of the tea estates in Kericho County as a case study. It adopted a case study design. Both purposive and simple random sampling techniques were used to select the respondents. Stratified sampling was also used to categorize workers into managers, supervisors and tea pluckers who provided the information. A target population of 426 and sample size of 214 participants was used. Questionnaires and Interview schedule were used to collect data. Data collected was coded and presented by use of descriptive statistics such as frequency tables, pie charts, bar graphs and Percentages. Findings revealed that introduction of the machines have generated some negative attributes to the firm and to the employees. Specifically, it has led to, the direct emission of smoke, noise and loss of employment opportunities as a major challenge. From the study, stakeholders can utilize the information to enhance development of the technology without impacting negatively on human resource.

Key words: *Productivity, Employee, Mechanical Tea Harvesting, Challenges.*

1. Introduction

Technology refers to current state of humanity's knowledge of how to combine resources to produce desired products, to solve problems, fulfill needs, or satisfy wants; it includes technical methods, skills, processes, techniques, tools and raw materials [Borgmann etal, 2006]. Tea Industry is one of the major income generations in Kenya and they are embracing new technology through implementation of Tea Plucking Machines. A Tea plucking machine is an automatic driven single blade Agricultural Machine, model EH26B and it is a gas tool. It has a net weight of 34kg and cutting width of 53cm and a reducing speed ratio of 3:87.These machines are manufactured mostly by Japanese and are quite expensive and beyond the reach of small tea planters. [http//www.made-in-china.com]

In Kenya tea plucking machines were introduced in 2006. It was due to the need to enhance productivity in the tea estates which was in response to the government's call for Industrialization and improvement in the agricultural sector. [James Finlay & Sotik company, 2007]. It is now 30years down the line since the idea of mechanization of tea harvesting has been tried but little has been achieved. The research tried to find out the challenges in the field that hinders full mechanization of tea harvesting in the Tea Sector.

Tea harvesting is a laborious task that requires some training in order to yield the best results. Fine plucking is done by plucking the bud, the second and third leaves only. This method provides the best quality tea. If more leaves are taken with the bud it is said to be coarse plucking and this produces lower quality tea.

Adoption of Technology in Agriculture

The current adoption of technology in Kenya is contained in Sessional paper No. 1 of 2005 which states that for the country to achieve the desired economic growth, targets and social development, a high priority needs to be placed on the development on human capital through education and training. According to a publication of the UK Parliamentary Office of Science and Technology [2006], Technology is still out of reach by many groups especially in developing with high population. Several factors contribute to this;

Lack of appropriate products: - products are often not designed to meet the needs of the poor or those in the remote areas.

Cost: - roughly half of the people in the world live in less than four dollars a day. Many potential users are too poor to afford any form of access to technology.

Skills: - even where there is physical access to technology, many people do not have the technical skills needed to use.

Human resources: - the high migration of skilled technology professionals from developing to developed countries contributes to lack of human resources to support technology.

Considerable achievements in agricultural production and technology have been transferred and adopted in both developed and developing countries. However since most of the technologies originate from the developed countries, their utilization in developing countries has involved making modifications to maximize benefits and make technologies relevant [Eisa, 1993]. Transferring agricultural technology to developing countries can be a lengthy process.

Agricultural technology continues to attract considerable controversy and debate. Market acceptability of mechanically plucked leaves is that, provided the quality is maintained, machine-plucked leaves appears to be just as acceptable to the market as the hand-plucked leaves. Manager of Ankole Estate in Uganda reported that initially, buyers were reluctant to purchase the mechanically harvested leaves. But as quality improved and a consistent supply emerged, a niche for these leaves was gradually established in the market and now there is hardly any difference in price between the estate's teas made from machine-plucked leaf and those made from hand-plucked leaf [Martin,1999].

The assumption of easy technology transferability from industrialized to developing countries equals one of the central ideas in the early development literature from the 1950s and 1960s, where it was fashionable to regard the availability of all the blueprints that were developed over the past several hundred years as a major source of advantage to developing countries. Some went as far as to regard 'technology transfer' as the essence of development [Krueger 1991].

The focus of Technology development will, at its most fundamental level, need to be guided by an understanding of the future direction of agriculture in the developing world and an appreciation of the changing ways in which it will contribute to growth and poverty reduction. In order to set the general direction for coherent and inevitably long-term investment in research and technology for agricultural development, we need a vision of where agriculture will be in twenty years time. Is there agreement on where agriculture is heading or should head? The answer is probably no, and the debate about the future shape of agriculture and the ways in which it will impact upon the poor remains contested [Ashley and Maxwell, 2001].

Hazell etal [2001], provides a matrix illustrating how different types of technology might be targeted in different regions, depending on: whether the country is middle or low Income; has liberalized markets; has scarce or surplus labour; good or poor Infrastructure and high or low agricultural potential. Similarly, the World Bank has proposed an International Assessment of Agricultural Science and Technology for Development to explore future technological needs. Given the broad range of perspectives on agricultural trajectories, it will be a significant challenge to establish a common view on research and technology priorities.

2. Literature Review

Challenges being faced with the Implementation of Mechanical Tea Harvesters

The major challenges being faced with the implementation of Mechanical Tea Harvesters are the resistance from the employees. For instance on 4th may 2010, Tea company workers protested at sacking. Employees said they were being replaced as companies are now using machines. Hundreds of tea workers in Nandi Hills held a peaceful demonstration to protest at the sacking of more than 10,000 colleagues in Nandi and Kericho Districts. The workers are axed after the introduction of Mechanical Tea Harvesters by Multinational Tea Companies [Nation 2010]. Plans by Brooke Bond Company to introduce Mechanical Tea Harvesters have been strongly opposed by leaders. Local MPs warned that if the Kericho-based large-scale tea grower implemented the plans, hundreds of pickers would lose their jobs. "The NARC Government promised Kenyans 500,000 new jobs annually and laying off workers will create a situation that will not augur well with local people," Belgut MP Charles Keter said [Nation, 2003].

According to Graves et al., [2004], there are many cases where these technologies have failed to gain acceptance either because of deficiencies in technical performance or because farmers have been unable to acquire the skills required to implement them, or to meet the often additional labour demands of these technologies. In terms of skills acquisition, by their nature these technologies are frequently championed by short-term projects or individuals. Often these initiatives lack the means to create the critical mass of information and support for farmers interested in learning the new techniques.

3. Research Methodology

Research Design

The study adopted a Case Study Design which seeks to describe a unit in detail, in context and holistically. It is an intensive, descriptive and holistic analysis of a single entity [Wilis etal, 2009]. The design was found to be appropriate because the research was conducted in a small area and the results were used to make general comments

for all Tea Estates. It also allowed the use of research instruments like the questionnaires and interviews schedule which were used to collect data for the study.

Target Population

This refers to a group of individuals, persons, objects or items from which samples are taken for measurements [Kothari, 2006]. The study targeted employees in one of the Tea estates in Kericho, who are involved in the use of the Machines which included: 408 Tea Pluckers, 16 Supervisors and the Estate Manager making a total of participants. The strata are shown in the Table below.

Strata	Target population
Tea pluckers	408
Supervisors	16
Manager	1
Total employees	425

Source; Personnel Division: October 2016

Sampling Procedures and Sample Size

According to Webster [1985], sampling is the act, process or technique of selecting a representative part of a population for the purpose of determining parameters or characteristics of the whole population. The study employed three sampling designs; Purposive, Stratified and Simple Random Sampling as shown below.

Strata	**Target population**	**Sample size**
Tea pluckers	408	204
Supervisors	16	8
Managers	1	1
Total	425	213

Source; field October 2016

Data Collection Instrument and Procedures

The study made use of Questionnaires and Interview Schedule. These are; Tea pluckers Questionnaire, Supervisors' Questionnaire and Manager's Interview Schedule. The above instruments where used to supplement each other and to give a deeper and wider exploration into research perspective. This is in harmony with what Mugenda [1999] said that research instruments are the means by which primary data is collected.

The data collected were organized, coded and analyzed using descriptive statistics such as frequency tables, pie charts, bar graphs and percentages. These methods enabled me collect data and explain phenomena more deeply and exhaustively. The study generated both quantitative and qualitative data. Kombo and tromp [2006] define data collection as gathering of specific information to prove or refute some facts. The researcher used note-taking method to record data during interview.

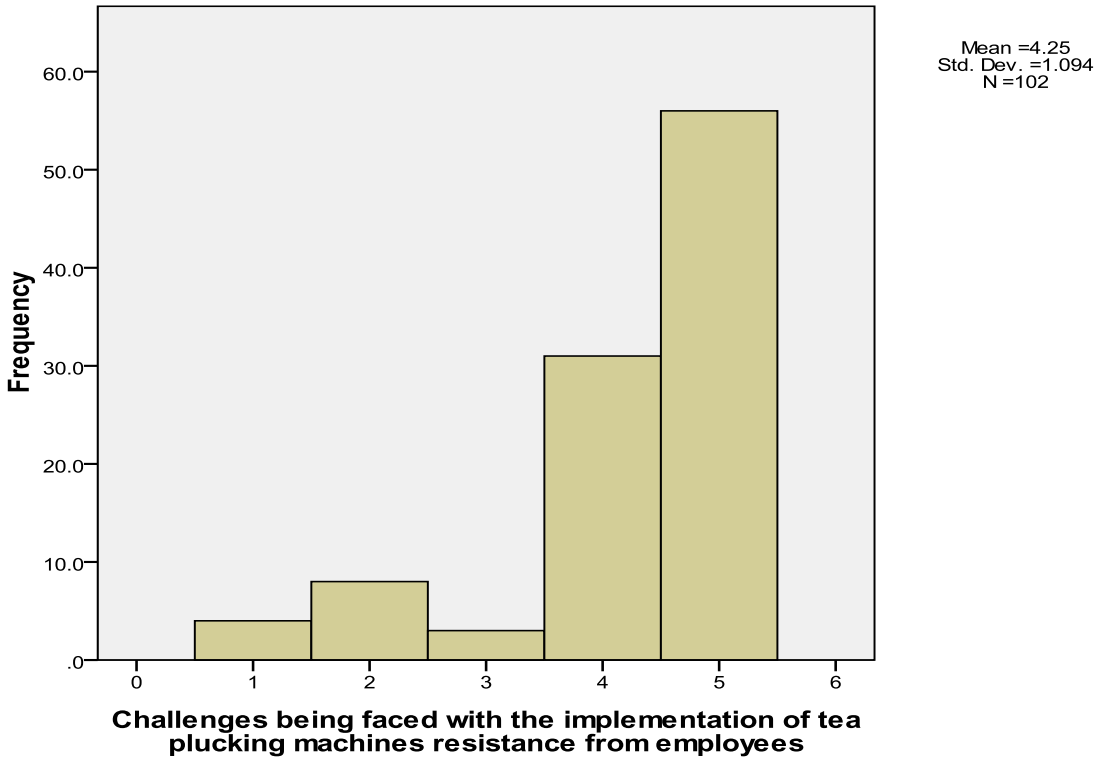
4. Discussion of the findings

From the research findings, Graves's assertion is true that introduction of MTH was faced with a lot of resistance and this is because of little awareness, deficiencies in technical performance and replacement of workers by the machines.

Mechanical Tea harvesters have not been fully implemented in tea estates. Many hand pluckers are still there. In spite of the anticipated benefits that have been associated with this form of technology, tea firms have been facing a lot of challenges. The researcher collected data from tea estates to find out the challenges that are being faced with the implementation of MTH and the results are presented below.

Resistance from the Employees

Tea pluckers have been striking and resisting the implementation of mechanical tea harvesters while the tea estates managers have been insisting on implementing them. The researcher wanted to find out if the employees resisted the implementation of the machines in tea estates. The study used Likert Scale that ranged from strongly disagree, disagree, undecided, agree and strongly agree. The results of this item were presented in figure below,



Resistances from the Employees

key 1-strongly disagree, 2-disagree, 3-don't know, 4-agree, 5 – strongly agree

From the findings in graph above, many employees resisted [73.5%] the implementation of MTH. Most of them believed that they would be retrenched. This is the reason why most estates are slow in implementing the use of the machines. These results agrees with what Graves et al., [2004] said, that there are many cases where these technologies have failed to gain acceptance either because of deficiencies in technical performance or because farmers have been unable to acquire the skills required to implement them, or to meet the often additional labour demands of these technologies.

Lack of Support from the Government

The researcher established whether the government supported the implementation of MTH in Tea Estates and the findings of this item were tabulated as shown in Table below.

Lack of Support from the Government

Response	Frequency	Percent	Cumulative Percent
strongly disagree	8	3.9	3.9
Disagree	26	12.7	16.7
Neutral	10	4.9	21.6
Agree	114	55.9	77.5
strongly agree	46	22.5	100.0
Total	204	100.0	

Source; field data October 2016

A good number of the respondents from the estate agreed and strongly agreed that tea estates lacked the support from the government. This is because most of the tea estates are owned by private sectors. Hence have to source funds on their own and not to depend on government support.

Lack of Skills on how to Use the Machines

The researcher went further and sought to establish whether lack of skills on how to use the machines was the major challenge to estate management during implementation. The findings of this item were tabulated in table below.

Lack of Skills on how to Use the Machines

Response	Frequency	Percent
strongly disagree	96	47.1
Disagree	52	25.5
Neutral	26	12.7
Agree	8	3.9
strongly agree	22	10.8
Total	204	100.0

Source ; field data 0ctober 2016

The findings show that that most of the employees strongly disagreed with the statement that the major challenge in the implementation of MTH is lack of skills among the employees in the estate. This could be because a lot of education and training of employees on the use of MTH is done. Implementation was done recently in most of the estates and so most of the employees are new in the job.

Poor Planting Design

The researcher went further to establish to what the respondents viewed poor planting design as the major challenge to implementation of mechanical tea harvesters in tea estates. The findings of this item were presented in the table below

Response	Frequency	Percent
strongly disagree	28	13.7
Disagree	34	16.7
Neutral	12	5.9
Agree	70	34.3
strongly agree	60	29.4
Total	204	100.0

Source; field data 0ctober 2016

The findings in the table above indicate that majority of the respondents agreed and strongly agreed that poor planting design in most of tea plantations is a major challenge to implementation of MTH. According to the information from the manager, most of the tea farms were designed for hand picking and that is why implementation is slow.

Supervisors Analysis on Challenges that are being faced with Implementation of MTH

Attribute	Yes F[%]		No F [%]	
Resistance from the employees	3	75	1	25
Lack of govt support	3	75	1	25
Lack of experience	2	50	2	50
Poor planting design	4	100	0	0
Poor management style	2	50	2	50

Source; field data October 2016

From the analysis above, supervisors agreed that the estates faced a lot of resistance from the employees [75%]. This could be due to the perception that they could be retrenched. They also agreed that there was no

support from the government. The workers union advocated for the rejection of the machines while the government kept quiet meaning it supported their introduction. The firm had to explain to the employees and the union the importance of the introduction of the machines and that the employees would not be retrenchment.

Most of the employees lacked skills on the use of the machines at the start of the implementation. This is due to lack of experience [50%] on use of MTH. The supervisors agreed that poor planting design was a major challenge during implementation of MTH. This is because the machines were used on already grown plants and that new plants were still young to judge whether the machines could be effective or not.

Majority of the supervisors agreed that there was poor management in the implementation of MTH. The management had not foreseen the planting design [50%] and what would happen to workers who could not use the machines. It was also revealed that supervisors were divided on the necessity of MTH in tea estates. Some cited reasons as high production and reduction of labour cost while others cited poor quality of Tea leaves and Health hazards.

Analysis of Manager's Responses on the Challenges that are being faced with Implementation of MTH in Tea Estates

Managers face a lot of challenges when implementing MTH. He revealed that;

…….Tea estates are owned by multinational companies and there is a tri- partie agreement among the government, union and the company on the estate operations, pay and workers welfare. Therefore the company cannot go fully mechanical until they make an agreement together. There are operations that cannot be done with the machines such as tipping.This is a process of establishing new plucking tables after pruning which requires hand plucking. The machines produce high quantity of leaves but the quality is very low and so a lot of sorting is done manually. As shown in Figure 3.0.

Photograph showing Employees Sorting Tea

Machines cut down all kind of leaves even the pre mature ones forcing the employees to do a lot of sorting to get the quality leaves. They also revealed that;

The estates cannot go fully mechanical because most of the initial planting design was meant for hand plucking. Machines need big spacing but most of the current lines are narrow. The Manager also revealed that when machines plucks tea, it takes longer time [24-27 days] to mature for the next round than hand picking that takes [7—9days].

Conclusion

There are a number of challenges that require solutions such as cases of pollution and heavy machines that cause health hazard to the tea pluckers. Machines cut down all kind of leaves even the pre mature ones forcing the employees to do a lot of sorting to get the quality leaves.

The estates cannot go fully mechanical because most of the initial planting design was meant for hand plucking. Machines needs big space but most of the current lines are narrow. Managers also revealed that when machines are used to pluck tea, it takes longer time to mature for the next round than hand picking.

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