

**IMPACT OF EDUCATION OF WOMEN ON PRODUCTION OF
GREEN GRAMS IN TUNYO DIVISION, ELGEYO
MARAkwET COUNTY**

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the University of Nairobi**

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DECLARATION

This research project report is my original work and has not been presented for any award in any other university.

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DEDICATION

This project is dedicated to my beloved parents Jonathan and Sylvia Kesery for their support both financial and moral during undertaking of this project and to my daughter Precious Sanaipei.

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LIST OF ABBREVIATIONS AND ACRONYMS

ASALs	Arid and Semi-Arid Lands
DFID	Department for International Development
DP	Diseases and pests
EMC	Elgeyo Marakwet County
EoW	Education of women
FS	Food security
GDP	Gross Domestic Product
GGP	Green Gram production
HD	Household Development
IFAD	International Fund for Agricultural Development
KARI	Kenya Agricultural research institute
LOE	Level of Education
MOA	Ministry of Agriculture
NGOs	Non-governmental organizations
PNG	Plant Nutrition and Growth
SD	Skills Development
TO	Training Opportunities
TOW	Training of Women
US	United States
WE	Women Empowerment

ABSTRACT

Women are vital part of any society. Over the years, there is a gradual realization of the key role of women in agricultural development and their contribution in the field of agriculture, food security horticulture, processing nutrition, sericulture, fisheries and other important sectors. Comprising the majority of agricultural labourers, women have been putting in labour not only in terms of physical output but also in terms of quality and efficiency. Women have participated in green gram production in all levels of production from Land preparation to marketing of the crop. The production of green grams has been practiced mostly in the rural centres and women have been noted to participate in it. Education has direct effects on agricultural production. In a country that depends majorly on agriculture for food security and economic development like Kenya, the education system has to be relevant and majorly inclined to agriculture. The system and curriculum of extension education has to be in line with production of pulses like beans, peas, lentils and green grams which form the highest percentage of food crops grown in Kenya. The ability to effectively comprehend on the content of extension education also depends majorly on the level of basic education of a person. Women with higher level of education in many parts of the world participate more effectively in agricultural production. The cultural aspect of women education and the social norms and values as a result of it affect the participation of women in agricultural production. This study aimed at finding out Impact of Education of Women on Production of Green Grams in Elgeyo Marakwet County. The study was guided by the following objectives: To establish whether the level of education of women affects green gram production in Elgeyo Marakwet county; to establish the training opportunities available for women on green gram production, the relevance of training opportunities for women on green gram production, to establish whether the knowledge and skills of women affects green gram production in Elgeyo Marakwet county. The study employed a descriptive research design whereby both qualitative and quantitative data were used in finding solutions for the study. The study targeted a population of 900 women in Tunyo Division of Elgeyo Marakwet County. Mugenda and Mugenda's formula (2003) was used to calculate the sample size of 269 green gram farmers. Stratified sampling according to the locations was done after which systematic sampling was used to select the final respondents. Ministry of agriculture officials concerned with extension education and traders involved in green grams trade were also interviewed. The study used questionnaires, interviews and Document review and analysis in collection of data. Data collected was analysed using descriptive frequency tables and percentages. The results of the study showed that education had 60.8% of impact on green gram production in Tunyo Division ($p < 0.05$). Results of the study further showed that there are few training opportunities available for women in the area and that the level of education of women was low, women had no adequate knowledge and skills on green gram production. The findings showed that training opportunities were relevant for ensuring women were socio – economically empowered. Challenges that women faced was related to ineffective training provided, lack of basic knowledge and long distance to training centres. The study recommends that the government should regularly provide training to women in the area through availing enough manpower to reach all sections of the district which were unreached while the women need to organise themselves in groups to ensure that they get first-hand information on developments of green gram farming.

CHAPTER ONE

1.0 Introduction

This chapter presents background to the study, statement of the problem, purpose of the study, objectives and research questions. This is followed by limitations and delimitation of the study and concludes with definition of terms.

1.1 Background of the Study

A country's social economic development is dependent upon the education of its citizens. Education has overtime been considered as raising productivity in all sectors of the economy including agriculture. According to Syed (2010), education enhances a county's growth by enhancing food security through adoption of modern farming techniques. In ideal circumstances education should be accessible for all in all sectors of a country's economy, agriculture not an exception. However, according to FAO (United Nations Food and Agriculture Organization) (2011) over two thirds of all women in Africa are illiterate and employed in the agricultural sector. This practise tends to render them inefficient in agricultural production. According to FAO (2009), Grams are annual legume crops grown for their seed. Grams could be green, black or yellow in colour. The green grams are the most commonly grown in the world. Green grams are native crops of India. Often called green gram or golden gram, it is cultivated in several countries of Asia, Africa, and the Americas. In Europe and the Americas, grams are referred to as Mung beans. Its scientific name is *Vigna radiate*. Just as in the production of any other food or cash crop, women are a crucial human capital in the production of green grams (FAO 2009).

Women who have attained some level of formal education are able to adopt modern farming techniques and improve their production in green grams. Milner (2005) pointed out that rural women with tertiary education in Malawi are able to participate better in green gram production than the ones with secondary and primary education and so on. However, through a study by Charman (2008), instances where women lack even primary education, production is wanting.

Training is one way of enhancing capacity of a human resource. In green gram production training through seminars and extension education is important in improving yields and enhancing productivity and also creates a sense of belonging to the farmers engaged in a particular crop (FAO 2003). In India, according to

Garikipati(2007) extension education offered to farmers improved their productivity in green grams by more than 50%. Since women constitute over 50 percent of the food producers worldwide and up to 60 to 80 percent in sub-Saharan Africa, it makes sense to expect that a corresponding percentage of agricultural extension and training services would be directed to women farmers. This is far from the reality. A 1989 FAO survey on extension services in 115 countries showed that women received only two to ten Percent of all extension and training services and only five Percent of extension resources worldwide. Another study by Mutangadura (2004) highlighted that even though training of women farmers are conducted, their frequency is also very low. They are therefore not able to maximise returns in farming. This is one reason why more than 50% of the world population remains food insecure according to World Food Programme survey (2011).

The relevance of an education system of a country is measured by the ability of the system to contribute to the attainment of the goals of that particular country. According to Quisumbing and Pandolfelli (2009), agricultural production being the backbone of most African states should take centre stage of the country's education system. Education of women on agricultural production ought to be explicit in the education system of country that majorly depends on agriculture but (Ashraf, 2008), in a study on women empowerment in Africa, noted that most educational curricula on agriculture lack essential packages that could lead towards women empowerment, household development and food security. These sentiments were echoed by Lastarria-Cornhiel (2006) who confirmed that most developing countries would not attain the millennium development goals on agriculture because of the irrelevance of their education systems.

Training opportunities on women through seminars and extension education have helped improve their skills in terms of land preparation, disease and pests together with plant nutrition and growth in green gram production. Mankazana (2006) in a study on skills on green gram production highlighted that women should be taught the basics in land preparation, planting, disease and pests, plant nutrition and growth and also harvesting to enhance their productivity. However, Mosedale (2005) in a study on assessing women's empowerment in Tanzania pointed out that 86% of women participating in green gram production lacked the necessary skills in land preparation, disease and pests, plant nutrition etc and this greatly affected their productivity.

Education in agriculture is key in developing countries. Women farmers are the pillars of African agriculture. Broadly speaking, the early studies legitimized the idea of women as productive partners in agriculture, discovering and documenting the various roles played by women as farmers, farm wives, and agricultural professionals and recounting the stories of successful women in these roles. Research that began to appear in the 1980's and continues in the 1990's has expanded the discovery process to more areas of the world, applying increasingly sophisticated methodologies of the social sciences to the study of women's roles and contributions to agriculture.. They are responsible for growing, selling, buying and preparing food for their families.

.In Britain, Elisabeth Jeggle, (2003) while studying the role of women in agriculture and rural areas learnt that whereas about 42% of the 26.7 million people working regularly in agriculture in Britain are women and at least one agricultural holding in five (around 29%) is managed by a woman, extension education still plays an important role in their performance in agricultural production. In most Latin American countries, women may freely enter into agricultural practices. However, in practice rural women often ask for their husband's authorization before undertaking a job, and quit it if their husband so requires (FAO, 1994).

Moreover, some laws explicitly allow the husband to interfere with the employment of his wife, although there is a trend throughout the region to repeal these norms. In Mexico, in plantations where Mung beans (green grams) have been grown, there is a widespread practice of recruiting women as temporary workers, without contract and on piece-work. These non-formalized situations entail the non-application of the protection accorded by labour law, and therefore sex/gender discriminatory practices. This has greatly been sighted in majority of the women with low level education (FAO, 1994 and 1996).

Throughout Asia and the Middle East, women's participation in formal employment is low, due to legal, educational and cultural factors (CEDAW, 2008). A common example of a legal obstacle in Jordan is marital authority norms conditioning women's employment in farms to the authorization of the husband; here, women are not even allowed to start up their own farms. In Syria, according to Belarbi *et al.*, (1997) wives can work outside the house only with the permission of the husband and cannot start up their own agricultural investment. As for labour legislation, although most countries have adopted laws or codes prohibiting sex discrimination in employment, discrimination remains widespread in practice, especially in rural areas.

Women agricultural labourers earn roughly between half and two-thirds of men's wages, although with considerable cross-country, regional and seasonal variation (FAO, 1995b). In Saudi Arabia and India, where green grams are grown, gender segregation in the workplace is strictly enforced and women as well as men work in the farms without any form of discrimination. Women also start up their own farming enterprises on green grams (Jha *et al.*, 1998).

In Nigeria, women make up a considerable portion of the agricultural labour force employed in the informal sector, especially in the farms. The women here are normally of low level education and little awareness on labour legislation (MacGaffey, 1991). In Burkina Faso, customary law contains labour obligations for women. In Comoé Province, young wives have the duty to provide labour for their husbands' fields, in addition to cultivating their own fields. The extent of this duty varies across ethnic groups, with particularly extensive labour obligations among the Turka and the Gouin. Women are liberated from these obligations usually in their mid-forties, when their children are old enough to provide labour or only when they go to school and attain some formal education enabling them to go attain some formal employment in the education sector (van Koppen, 1998). In Lilongwe in Malawi, women have for many decades participated in green gram production. Due to the low level of education, the women in this part of Africa have failed to effectively involve in viable agriculture apart from being casual labourers in the farms. Very few illiterate women in Malawi own land and this has also hampered their participation in effective green gram production. This is according to The Montpellier Panel (2012) *Women in Agriculture: farmers, mothers, innovators and educators*. London: Agriculture for Impact.

Mwalilo (2003) reported that in Kenya, especially in ASAL like Kitui and Makueni where green gram production has been practiced, women have participated in majorly providing casual labour. In Kitui, green gram production has been done on a small scale with women being in the front row in doing all the labour from land preparation to harvesting. As a result of this, the level of production and the output therein has been dismal. In Elgeyo Marakwet county, green gram production has been seen to be economically viable. In this division, according to a baseline survey conducted by World Vision (2012), 80% of the women are having low level education. These women have been seen to spearhead all the agricultural activities from land preparation to marketing of the crop. This study is aimed at finding out the

impact of education of women in the production of green gram in Elgeyo Marakwet County and thereby helps improve their production in this crop.

1.2 The Statement of the Problem

Education enhances a country's economic growth by enhancing food security and household development (Bellamy 2012). According to FAO, IFAD and World Bank (2009) both males and females start to participate in farming activities at an early age (about 5-9 years) the level of female participation increases at the same rate as male participation. In the age group (20-34) years female participation increases significantly as most male households seek job opportunities outside agriculture as a result of the limited size of the family house holding. Squire (2003) in a study on strategies for enhancing women's full participation on sustainable agriculture indicated that 60 to 80 percent of the agricultural workforce constitute of women and that agricultural extension education has been offered in so many countries to empower women in agricultural production especially in Mung bean (green gram) production.

In Sri Lanka for example, extension education is offered to women participating in green gram production and this has been seen to improve the yields of the crop over the years (Ariyaranthe, 2004). In Elgeyo Marakwet County, in Kenya, green gram production is done majorly by women and the ministry of agriculture has offered extension education to them on skill acquisition. In spite of this, the community in Tunyo is still not food secure and households live way below the poverty line. Again, production of the crop has remained at 3-90kg bags per acre and according to Lusweti and Omollo (2009) both from KARI, one acre should produce more than 5-90kg bags of green gram. In spite of the effort put to raise production in green grams in Tunyo, productivity has remained low. This study was aimed at finding out what effect the level of education, training opportunities, and the skills attained by women have on production of green grams in Tunyo.

1.3 Purpose of the Study

The purpose of the study was to establish the impact of education of women in the production of green gram in Tunyo Division, Elgeyo Marakwet County.

1.4 Research Objective

1. To find out the influence of the level of education of women on green gram production in Tunyo Division, Elgeyo Marakwet County
2. To find out the training opportunities available for women on green gram production in Tunyo Division, Elgeyo Marakwet County
3. To establish the relevance of education of women on green gram production in Tunyo Division, Elgeyo Marakwet county
4. To establish whether skills attained by women affects green gram production in Tunyo Division, Elgeyo Marakwet County

1.5 Research Questions

The study was aimed at answering the following questions;

1. To what extend does the level of education of women affect green gram production in Tunyo Division, Elgeyo Marakwet County?
2. Which training opportunities are available for women in Tunyo Division, Elgeyo Marakwet County towards green gram production?
3. What is the relevance of training for women in Tunyo Division, Elgeyo Marakwet County towards green gram production?
4. To what extend have the skills acquired by women affected green gram production in Tunyo Division, Elgeyo Marakwet County?

1.6 Significance of the Study

Kenya has embraced agriculture as the backbone of its economy. With embracing of devolution and the coming in of the county governments, agriculture and food security would be integrated so as to enhance food security and economic empowerment of the locals. Green gram is an important subsistence crop for food and income security. However, in Elgeyo Marakwet, its yields are very low and acreage is not improving with improvement in agricultural technology. This partly, is because there is lack of adequate technologies and technical advice to support women involved in green gram production and accentuates its development and wide adoption, as mainstream KARI (Kenya Agricultural Research Institute) systems have not targeted green gram. It is possible to elevate green gram in Kenya to the status of elite legume crops, such as beans and cowpea, if factors limiting its production are addressed. For instance, there is a paucity of information on green gram production

with regard to suitable cropping systems; varietal diversity and suitability; profile of pests and diseases affecting the crop and their seasonal occurrence; and its role in household food security and income generation. Support of women, who are majorly involved in rural farming where grams fall, is not structured especially in terms of capacity building. This project will generate information and solutions to address the above aspects.

1.7 Basic Assumptions

The study assumed that there is existence of a large number of women taking part in green gram production in Tunyo division, that there were enough resources to complete the study, the women and other respondents in Elgeyo Marakwet County were willing to give information necessary for the study and that the information retrieved would meet the purpose of the study.

1.8. Limitation of the Study

Firstly, the fact that green gram production in Kenya is still very low, there was limited literature to review due to little previous research in the country and hence limited information, the researcher's duty was to look for literature outside Kenya and this was helpful in gaining insight into green gram production. Secondly, women being the major respondents felt targeted and at times some were not willing to be interviewed or to give information fully. To overcome this, proper explanation and consent was given by the researcher and the assistants and this helped facilitate successful data collection.

1.9 Delimitation of the Study

The study was delimited to Tunyo division, Marakwet West part of Elgeyo Marakwet County. The study covered farmers participating in green gram production with an emphasis on the women farmers in Mon, Chesuman and Arror locations. So as to compliment the study, MOA and MOE officials together with green gram traders participated in the study.

1.10 Definition of Significant Terms

Education of women-	in this context refers to all forms of formal and non-formal education offered to women that contribute to building the capacity of women in green gram production. Formal education, in this case will range from primary to tertiary education while non-formal includes training and seminars.
Extension Education -	Extension work is an out of school system of education in which people learn by doing. It is partnership between the people at village level and the government.
Green gram -	refers to bushy leguminous plant widely cultivated in warm regions of India and Indonesia and United States for foliage and especially its edible seeds. It's also referred to as Mung beans and <i>Vigna radiate</i> (Charles Erikibe 2003)
Impact of education -	the direct unquestionable influence of education on something
Levels of education -	According to the international standard classification of education (2013) levels of education are the gradual stages in a system of education of a country from preschool to tertiary education.
Production of green grams-	This are all the steps from land preparation, to planting to harvesting and marketing of green grams.
Relevance of education -	According to the Education For All: Global Monitoring Report (2005) - two principles most attempt to define relevance in education: the first identifies learners' cognitive development as the major explicit objective of all education systems. The second emphasizes education's role in promoting values and attitudes of responsible citizenship and in nurturing creative, physical and emotional development.
Women	adult female human beings

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The purpose of the review was to assist identify gaps which exist in past studies, the strength of the studies and its recommendations could be used in further research in this study while at the same time avoiding duplication. The sources of literature included: text books, articles, research abstracts, journals, and websites and government publications.

2.1.0 Education of women, level of education and production of green grams

Education may have both cognitive and non-cognitive effects upon labour productivity. According to Cotlear (1990) Cognitive outputs of schooling include the transmission of specific information as well as the formation of general skills and proficiencies. Education also produces non-cognitive changes in attitudes, beliefs and habits. Increasing literacy and numeracy may help farmers to acquire and understand information and to calculate appropriate input quantities in a modernizing or rapidly changing environment. Improved attitudes, beliefs and habits may lead to greater willingness to accept risk, adopt innovations, save for investment and generally to embrace productive practices (Appleton and Balihuta 1996; Cotlear 1990). Education may either increase prior access to external sources of information or enhance the ability to acquire information through experience with new technology. That is, it may be a substitute for or a complement to farm experience in agricultural production. Schooling enables farmers to learn on the job more efficiently (Rosenzweig 1995).

Different countries have agriculture education included in their curricula. Some countries have agriculture education started up from primary school or elementary school while others have it started up in secondary school. According to Earton (1994), agriculture instruction in schools is majorly on skills acquisition to facilitate for practical farming for food production and economic development. Galabawa (1990), in a study on implementing on educational policies in Tanzania discovered that most schools lacked the practical expertise in the teachers to effectively take students through agricultural practical. He added that green gram production in Tanzania is majorly affected by the low level of education of women who majorly participate in its production. According to FAO (2009), more than 60%

of women participating in agricultural production are illiterate. The study however highlights that the level of participation and production in agriculture is dependent on the women's level of education and according to Massey (1986), women who completed tertiary education in India have the highest productivity in green grams of more than 5 bags per acre of land.

2.1.1 Education of women, primary education and production of green grams

In Ethiopia Mirotschie (1994) cited by Weir (1999) investigated technical efficiency in cereal crop production in Ethiopia using aggregate data for the period 1980-86. The data on education are weak. Although conclusions could be drawn with caution, he reports that primary schooling tends to increase productivity, while secondary schooling had no effect. Admassie and Asfaw (1997) estimate a stochastic frontier profit function to investigate technical and allocative efficiency of farmers. Farmers who had primary education were found to be relatively and absolutely more efficient than those without education. However, their sample selection methodology was unsatisfactory and casted doubt upon the reliability and generalisability of their findings.

Dercon and Krishnan (1998), using panel data on six sites covered by both the ERHS and a 1989 IFPRI survey, found that the decline in poverty between 1989 and 1994 was greater for household heads who had completed primary schooling than for those who had less (or no) education. Poverty reduction is defined by a headcount measure in terms of greater consumption per adult equivalent across the two periods. The decomposition results suggest that the educated were able to take better advantage of opportunities to increase consumption over this period. In sum, this body of research is suggestive of the possible benefits of schooling in agricultural areas in terms of increasing efficiency and the adoption of innovations as well as in reducing poverty. However, there is at present no convincing direct evidence to quantify the magnitude of the effect of education of women upon green gram production in rural Kenya. That is the aim of this study.

2.1.2 Education of women, secondary education and production of green grams

The level of education affects women's economic participation through determining both the likelihood of women's labor force participation and their competitiveness in the labor market: Secondary and higher levels of education

provide the highest returns for women's empowerment in terms of employment opportunities (Govinda 2008). In addition, for women to be more competitive, they need secondary education and training in skills that are appropriate for the market place. Being literate or having only primary education is not enough to enhance productivity or obtain better-paying jobs. Secondary or higher levels of education are needed to improve options and outcomes for women. That said, for secondary and higher levels of education to have the greatest payoff (ICRW 2005; UNIFEM 2004; Gupta and Malhotra 2006).

One study (Task Force on Education and Gender Equality 2005b) estimates that women receive only slightly higher returns to their investment in education (10%) than men (9%). Returns vary, however, by the level of education. Women experience higher returns to secondary education (18%) than do men (14%), but lower returns (13%) to primary education than do men (20%). Women have higher rates of return than men to post-secondary education (Boothby *et al.*, 2002). Another study (ICRW 2005) found that in India, the wage benefit for women with secondary education was double that for men. Lower returns to primary education for women in developing countries are actually a major policy concern. These results are consistent with results of studies in developed countries. The rate of return to university education is found to be higher for women than for men in most OECD countries (Ono 2001). The benefit of a university education on hourly wages is more apparent for women (Leary *et al.* 2004). Thus, women's higher education is essential to reduce the gender pay gap.

2.1.3 Education of women, tertiary education and production of green grams

The UNESCO (1961) conference on the "Development of education in Africa" recognized that, for the increased use of educated women power in the working life of community there is need to develop a new conception of the role of women in life of the community, to improve their role in life as homemakers. The conference the importance of women being empowered for access relevant information sources in view of the roles that women play in society and the conditions that they face. The importance of tertiary education is further reflected in a cost-benefit analysis carried out by the World Bank (2006). It shows that investment in the education of females has the highest rate of return of any possible investment in development.

Bartecchi (2003) brings evidence of a group of tertiary literate women from the South Coast of Kenya expressing joy over the advantages of their recently acquired skills in reading, writing, and calculation. They reckoned that they could now sign their names; they had more control over money transactions, and could read medical prescriptions and instructions. “Our eyes have been opened,” said one of them, expressing her new sense of pride and increased self-reliance. This is essential not only for preventing an adverse impact of the social conditions of women and children but also for enhancing women’s equitable access to the benefits of information and productive resources such as credit for the improvement of household food security. Literacy is also important for the health status of a nation in particular reference to women.

According to UN (2002), child mortality would be reduced more effectively by providing women with ten years of education. When women are literate they know their reproductive rights and how to take care of families hence reducing maternity and infant mortality rates. They also understand birth control measures and so reducing population explosion which is one of the major contributing factors to diminishing capacity of the land and subsequently food insecurity. Given the relationship between female education and economic development especially at the first and second levels of literacy, the positive impact on health, well being and the process involved in the transforming societies makes education in any population an imperative.

2.2.0 Education of Women, Training Opportunities and Production Green Grams

According to FAO (2012) formal agricultural education is needed for the training of skilled professionals to support agriculture through education, extension, information, research and entrepreneurship. Non-formal (extension) education is needed for training farm families. Furthermore, promoting indigenous knowledge and farmer-to-farmer sharing of information is essential for achieving the goal of food security. In most developing countries, women are major contributors to agricultural production, and especially food production. Increasingly, it is recognized that the failure of many agricultural development efforts can be attributed to an underestimation of the need for agricultural training and information for women

farmers. Unfortunately, there is a global trend towards declining investment in non-formal education.

FAO's (2012) figures show that investment in agricultural training, extension and research has declined from 9 percent of total donor agricultural assistance in 2009 to 2 percent in 2011. In India, for example according to the Government of India's ministry of agriculture, women participating in green gram production all have low level education and over the years no tangible investment has been made to curb the same. In addition to increasing overall agricultural production, closing the gender gap in agriculture would also put more income in the hands of women - a proven strategy for improving health, nutrition and education outcomes for children. In his book closing the gender gap in agriculture, Ranei (2011) reported that one of the best investments we can make is in building the human capital of women in basic education, market information and agricultural extension education. , he added that essential building blocks for agricultural productivity and economic growth is enhancing capacity for women.

2.2.1 Education of Women, Extension Education and Production of Green Grams

Research shows that women constitute an increasingly large proportion of smallholders, and that both men and women farmers can benefit from training in agricultural techniques, as well as business management and marketing skills (World Bank and IBRD, 2009). Failure to address the agricultural needs of women, including their training needs, is inefficient, and there is significant evidence that it has constrained agricultural growth (World Bank and IBRD, 2009).

Although women play a major role in food production in many countries of the world, agricultural information is not effectively reaching and benefiting these key contributors to food security. There is wide spread recognition of the need to improve both agricultural education and extension work with rural women. This is necessary as both a fundamental right and as a matter of good sense. As a cost-benefit analysis by the World Bank showed, investing in the education of females has the highest rate of return of any possible type of investment in developing countries ("Women Feed the World", FAO, 1996). In the case of agricultural extension, a major problem is that in many of the courses of study at schools and colleges of agriculture, and in the in-service training extension workers receive after graduation, there is insufficient

examination and discussion of the roles of rural women in agricultural production and rural development. Too little time, if any, is devoted to gender analysis and addressing the question of how extension work can be carried out effectively with rural women.

In Ethiopia, International Livestock Research Institute (ILRI) (2010) observed that in rural areas women farmers rarely got extension support that would enable them to enhance their knowledge and skills, and thereby improve the performance of their agricultural activities. As a consequence, the traditional extension approach hinders agricultural development. The focus on men is based on the assumption that they will pass the knowledge acquired to their wives and other family members. But this does not happen in reality. Hence, women farmers usually have limited access to improved agricultural technologies and packages promoted by the extension system. This constrains their access to various inputs and services including knowledge, and limits their participation in market-oriented agricultural activities. This loss in productive potential not only impacts at the household level but also on the national economy.

2.2.2 Education of Women, Seminars and Production of Green Grams

Research among women farmers in Pennsylvania in the United States of America (USA) reveals that they seek educational events focused on marketing, farm productivity, soil fertility, pest management, and equipment operation and maintenance. They want events in a format that respects their knowledge and desire to learn from one another (Trauger, Sachs, Barbercheck, Kiernan, and Brasier, 2008). Because of this demonstrated interest and need for educational programming among women farmers, a survey of Pennsylvania State University (PSU) Extension personnel was conducted to understand their experiences with, and knowledge of, women farmers and the extent to which Extension educators target this audience when they develop and market their programs. This article reports these survey results and discusses how Extension can enhance efforts to meet the educational needs of women farmers.

Recent research suggests that training has the potential to contribute very positively to the development of networks. The provision of training can itself improve the effectiveness of groups. A study in Punjab found that technical training improved the attitudes of rural women in self-help groups to a range of indicators. After training, the women were significantly more likely to believe that groups could lead to socio-economic empowerment of the poor in rural areas. Interestingly, training

also increased the importance they attached to needs assessments prior to training, and made them more aware of the importance of financial assistance in setting up a venture (Meena, Jain and Meena, 2008).

Training specifically designed to support the functioning of groups may also be a valuable complement to technical training, enabling more effective delivery (Joy, Prema and Krishnan, 2008). The review of practice drew out the importance of supporting the development of effective groups. A review of 59 natural resources management projects found that training did not automatically foster the networks of useful relationships that allow groups to support their members and improve their ability to access services. Rather, new organizations needed specific group management training and sustained support to survive in the long term (Johnson, Lilja, Ashby and Garcia, 2004).

The FAO Honduras project report found that training in group management was necessary to support women's participation through group organization. The benefits of the gender sensitization work undertaken in the project were only realized because of a simultaneous participatory training programme that strengthened the capacity of the women farmers' groups to interact with the extension agents and communicate their training needs (Fleck, 1994). Similarly, Chaturvedi and Gray (2001), reporting on entrepreneurship development of women in Bangladesh, found that groups setup for the purpose of administering credit required additional support before they could offer collective support for their members' business development.

2.3.0 Education of Women, Relevance of Education and Production Green Grams

The mission of Agricultural Education and Training (AET) in Africa is to work toward improved, relevant, and effective teaching, research and extension in the 21st century (Lindley Van Crowder and Don, 1996). Therefore, improving human capital in Agriculture is especially important where the shortage of trained human resources is a major limiting factor to development (Lindley *et al.*, 1996). One of the main challenges that constrain quality provision of AET in South Africa is lack of access mostly by previously disadvantaged groups like women (DoA, 2007).

Recent studies of Agricultural Education and Training in Sub-Saharan Africa suggest that many agricultural education curricula have shortcomings as they are unresponsive to socio-economic, technological, physical and environmental changes

in the rural sector and are inappropriate for the local context. Furthermore, many curricula for both formal and non-formal AET do not involve any form of systematic training needs analysis and often adopt delivery modes and mechanisms that fail to suit the reality of the situation of people in their community context. This situation extends beyond the sub-Saharan region to many countries throughout the world, including South Africa (Wallace *et al.*, 1996). Generally the improvement of a country human resource capacity for productivity is a prerequisite for social, economic and technological development. Thus both formal and non-formal education is essential for improving agricultural and rural development. Especially for women who are the key players in agricultural production quality education should be enhanced through proper curriculum and investment in the same.

2.3.1 Education of Women, Food Security and Production Green Grams

Food security is an increasingly critical global issue, affected by complex and inter-related set of variables that influence the availability and access to food in each country (FAO 2009). At one end food security implies the availability of adequate supplies at a global and national level while on the other; the concern is with adequate nutrition and well-being. Gassol de Horowitz (1993) identifies food security at three levels namely global, national and household. The focus of this study is food security at the household level; however it may not be discussed in isolation of the rest of the world. World hunger and household food security have been high on the development agenda of many countries and international organizations such as the United Nations' FAO and WFP. In 2002, the world's heads of states committed their countries to eradicating hunger and reducing the number of undernourished people by 50% by the year 2015 (FAO 2009).

Rural women play a vital role in advancing agricultural development and food security (FAO, 2011). They participate in many aspects of rural life – in paid employment, trade and marketing, as well as many unpaid activities, such as tending to crops and animals, collecting water and wood for fuel, and caring for family members. Women also manage household consumption and food preparation. But women face many constraints in the multiple activities they pursue – less land ownership, access to credit, extension and other services, and ability to hire labor (Doss *et al.*, 2008). Too often, these constraints as well as women's current and potential contributions to agricultural production go unrecognized.

Increasing training and education of women on agricultural production opportunities for women can have a powerful impact on productivity and agriculture-led growth (FAO, 2011). Women are just as efficient agricultural producers as men and can achieve similar yields when given equal access to resources, including training and services. In Kenya, Saito, Mekonnen and Spurling (1994) found that women could increase their crop yields by approximately 20 percent if given the same access to the same resources as men. In Burkina Faso, it has been estimated that overall household production could increase by about six percent by more equitably distributing fertilizer and labor between male and female-farmed plots (Udry, 1996). The Food and Agriculture Organization of the United Nations (FAO) estimates that if women had the same access to productive resources as men, they could increase yields on their farms by 20–30 percent. This increase could raise total agricultural output in developing countries by 2.5–4 percent and reduce the number of hungry people in the world by 12–17 percent, up to 150 million people (FAO, 2011).

Increasing attention is being given to the role of smallholder subsistence agriculture in ensuring the food security of the African continent, seeing that 73% of the rural population consists of smallholder farmers (IFAD, 1993). Small scale or subsistence farming in Africa may not be discussed in isolation of women who make the majority of rural populations (ZWRCN: 2004). While there are different perceptions to the concept household-head, this study subscribes to the view that a household head is responsible for the day to day activities and ensures its food. Boserup (1994) suggests that a third of rural households in Africa are solely headed by women. The percentage of women headed households range from 5% in Burkina Faso to 60% in the communal areas of Zimbabwe. This is confirmed by the CSO (2002) that more than 1 million families live in the communal sector of Zimbabwe whose mainstay is farming and about 60% of the households are headed by women.

The picture portrayed by this analysis is that food production in most rural areas in Africa is closely associated with the situation of women however they play these roles in the face of enormous social, cultural, and economic constraints. (FAO, 1999) The implications are largely negative on the members of female-headed households, which are typically, associated with increased simpler farming systems, inadequate services and meagre incomes against a background of insufficient literacy levels. The International Food Policy Research Institute(IFPRI) (2004), a Food Policy Report brings together evidence on the key roles that women play in ensuring food

security and examines ways to strengthen food production, economic access to available food, and nutritional security. The report reveals that availability and capability to access productive resources such as land, inputs, information and knowledge may enhance or limit women's capacities for household food security. According to Moser (2003), most women have no access to land, credit, extension service and relevant information and technology. In most of rural Africa access to information is limited, and especially so for the majority of rural women due to insufficient levels of literacy among other factors.

When women's productivity and incomes increase, the benefits amplify across families and generations. Women tend to devote a larger fraction of their income to their children's health and nutrition, laying the foundation for their children's lifelong cognitive and physical development (Duflo, 2003). In Nepal, for example, the children of women who own land are twice more likely to be adequately nourished than children in households where women work on family land they do not own or children growing up in landless households. Mothers who own land are better able to provide more nutritious food to their children and ensure their health and wellbeing (Keera, 2007).

2.3.2 Education of Women, Women Empowerment and Production Green Grams

Education is one of the most important sources of women's empowerment. In addition to being one of the main five most important dimensions of female empowerment (WEF, 2005), it plays a critical role in achieving the other key dimensions. Concerning political empowerment, no doubt that educated women are better informed about their legal rights and how to exercise them and thus are more politically active and can participate equally in societal and political decision-making processes. Women's levels of education determine their chances of becoming parliamentarians (Moghadam 2003; Eckert et al. 2007; Morrison et al. 2004; Rihani et al. 2006).

With respect to women's health and well-being, education gives women the knowledge to demand and seek proper health care. Thus, it is evident from different studies that there is a negative correlation between female education and maternal mortality and a positive correlation between female education on one hand and women's life expectancy and family health on the other hand. Education here refers

not just to getting education but to the level of education which is found to be more important; only at secondary or higher levels of schooling does education have a significant beneficial effect on women's health (McAlister and Baskett 2006; Task Force on Education 2005a; 2005b; Eckert et al. 2007).

Besides, education enhances women's well-being. It reduces violence against them, gives them a more autonomy in shaping their lives, improves their status within the family and gives them a greater voice in household decisions, including financial decisions (Lewis et al. 2008; Task Force on Education and Gender Equality 2005b; ICRW 2005; Malhotra and Mather 1997; Odutolu et al. 2003; UNDAW 2006; Aksornkool 1995; UNICEF 2005). In addition, education is essential to sustain gains concerning women's empowerment for future generations, through its intergenerational effects. Mothers' education shows universally positive impacts on children's schooling. The effect is more pronounced for girls than for boys and is significantly stronger than the effect of fathers' education, particularly where girls' enrollment lags behind that of boys. This effect is stronger, the more educated a mother is. Besides, daughters of educated mothers are more likely to have higher levels of educational attainment, which comprises a "multiplier effect" (Lewis et al. 2008; Schultz 2002; Task Force on Education 2005b; Moghadam et al. 2003; Blumberg 2005; UNFPA 2005; UNDP 2003; Sweetman 2008; Care 2005). In many countries, each additional year of formal education completed by a mother translates into her children remaining in school for an additional one-third to one-half year.

2.3.3 Education of Women, Household Development and Production Green Grams

Although women are the main actors in feeding the household, they often have little or no access to land, credit, education and technology. Little attention has been paid to alleviate women's problems, particularly those in rural areas who majorly participate in agricultural production. Due to gender blindness that still prevails, agricultural policies, on the whole, do not address the needs of women farmers adequately (FAO, 1998).

A total of 40% of the households in communal areas of Zimbabwe are female headed, as men leave their homes in search of jobs in urban areas (Zwart, 1990). Hence, the role of women in agriculture has tremendously increased. This trend has been called the "feminization of agriculture" and is most emphasized in Sub-Saharan

Africa (World Bank, 1996). Extension educators are responsible for helping these women clients to accurately identify their educational needs in agricultural production and thereby improve productivity.

2.4.0 Education of Women, Skills Development and Production Green Grams

Education at formal, non-formal and informal levels is viewed as a critical factor in either facilitating or handicapping women's participation in distribution, utilization and management of resources at the disposal of a community (Government of Kenya and UNICEF, 1992). The kinship principles in many African societies take the form of unilateral descent systems that are patrilineal, resulting in patriarchal authority structures, hence male dominance and male chauvinism. Women are thus junior partners in decision-making. Because of this cultural attribute, training of women in skill and access to credit facilities has been noted to be a matter of less concern. Women therefore do not receive the right training for improved green gram production (Zwart, 1990).

Another major problem is that in many countries there are too few women professionals trained in agriculture. A 1991 FAO Expert Consultation on "Strategy Options for Higher Education in Agriculture" urged that special efforts be made to recruit and support female students who could become extension agents, agricultural researchers, instructors and policy makers. A wide range of factors, many of them deeply embedded in the gendered nature of culture and society, prevent women from participating in formal agricultural education and non-formal extension training. As a result, they are on unequal terms with men in employment and self-employment. The unequal educational opportunity for women results in the unequal participation of women in the employment market (FAO, 1991).

According to Kathleen Kolette(2009) in many developing nations, agriculture still holds the key to reducing poverty and increasing the security of livelihoods. Agriculture has been faced with many challenges and green gram production mostly practiced by rural women has had enough shares of these challenges. In attempting to deal with these issues, the importance of training cannot be underestimated. The skills to improve productivity, increase adaptability to deal with change and crisis, and facilitate the diversification of livelihoods to manage risks are at a premium in rural areas. In many cases, these skills are an issue of survival. Providing these skills effectively is one of the key challenges of rural development, but it has not always

been well met, usually because the contextual factors that prevent small farmers from accessing and applying training have not been addressed. Men have continued to enjoy access to training on agriculture more than the women who are majorly involved.

Leach *et al.*, (2000) followed women who undertook training in green gram production in India, Ethiopia, Peru and Sudan, and documented its effects on their income-generation activities, social position and relationships. Despite the differences in the groups' circumstances, the study provided useful insights into the interplay of training, social factors, and productive ability. They also found that group training offered women the chance to reflect on and re-evaluate their productive activities, encouraging them to think entrepreneurially in green gram production.

Land utilization during extension education is another essential aspect of agriculture development besides having land rights or ownership. Gender inequalities, as attributed by culture, influence the differences that exist between men and women in accessing inputs for land use despite being a challenge to both. According to Moser's Framework, addressing the challenge of inputs to women entails meeting their practical needs since it does not challenge their subordinate nature (March, Smyth, and Mukhopadhyay, 1999). Research suggests that giving women skills, knowledge and confidence in a variety of settings will add to the profitability and sustainability of the family farming enterprise and have flow-on benefits to rural communities (Hamilton 2006).

2.4.1 Education of Women, Land Preparation and Production Green Grams

Despite the increased involvement of women in all areas of agriculture, men still tend to be more involved in the production of crops that will be marketed ('cash crops') while women bear more responsibility for producing the staple crops for feeding the household (World Bank and IBRD, 2009). Additionally, some agricultural tasks such as weeding are widely perceived to be 'women's work', while other tasks such as handling machinery and tools are performed primarily by men. Overall, women tend to perform more time-intensive, labour-intensive agricultural tasks, while men tend to control mechanical devices, and tasks involving physical strength (World Bank and IBRD, 2009, Deere, 2005; Saito, 1994). In addition to these traditional tasks, women in rural areas are increasingly performing multiple roles including domestic chores and earning supplementary cash through other work, in response to

the changes in the rural economies which have resulted in male migration to urban areas. They are consequently time-poor, with many of them working up to 16 hours a day (World Bank and IBRD, 2009; Saito, 1994; Paris and Chi, 2005).

2.4.2 Education of Women, Diseases and Pests and Production Green Grams

Admassie and Asfaw (1997) noted that Ethiopian farmers have faced frequently changing input and output prices under the new government. In addition, unpredictable weather, pests and crop disease all contribute to an environment in which farmers must adapt frequently in order to survive. As a result, there may be an efficiency advantage for farmers who are better prepared to anticipate and cope with disequilibria. Thus, even in the absence of innovation, farm productivity may be enhanced by investments in education.

In most cultures the application of pesticides is considered a male task, as women are aware of the danger to their unborn children of exposure to chemicals (Prakash, 2003). Women do a major part of the planting and weeding of crops. Care of livestock is shared, with men looking after the larger animals and women the smaller ones. Marketing is often seen as a female task, although men are most likely to negotiate the sale of crops. Some jobs are gender neutral. The introduction of a new tool may cause a particular job to be reassigned to the opposite sex and men tend to assume tasks that become mechanized. The impact on women of the modernization of agriculture is both complex and contradictory. Women have often been excluded from agrarian reform and training programmes in new agricultural methods (Prakash, 2003). Where both men and women have equal access to modern methods and inputs there is no evidence that either sex is more efficient than the other. Technological changes in post-harvest processing may even deprive women of a traditional income-earning task.

Saikou, Kao and Huang (2009) reports that in the Gambia, women vegetable growers face production constraints. The constraints reported from this research work on vegetable production and marketing are numerous and worthy mentioning. The most salient constraints in the production of fruits and vegetables mentioned by the growers were losses due to deleterious incidence of pests and diseases. From the result, it shows that 100% of the respondents mentioned pests and disease. The incidence of pests and diseases is a major threat or bottleneck for the production of fruits and vegetables in the Gambia. Moreover, the Agricultural Pest Management

Unit (APMU) conducted series of training programmes throughout the Gambia, to trained women farmers how to control the incidence of pests and diseases by using bio – pesticides and other available local resources. Other production constraints mentioned by these growers include; inappropriate use of technologies, inadequate water supply and poor soil fertility, lack of improved seeds, market glut, low prices and lack of financial resources. The government and donor agencies need to double their efforts to come to them plight of these women farmers, so that production and income can increase concurrently. However, with all these constraints the women vegetable growers are playing important role in socio – economic development of the country. These women are paying school fees, feeding clothing and footing medical bills as mentioned by women farmers.

2.4.3 Education of Women, Cropping Systems Plant Nutrition and Growth and Production Green Grams

Technical improvements have been disproportionately focused on cash crops and activities which are traditionally undertaken by men. Labour-saving technology designed to reduce the time burden on women has received far less attention, with the result that women’s productivity is constrained (World Bank and IBRD, 2009; Paris and Pingali, 1994). In as much as technology development has not given priority to traditional women’s tasks, it has also been slow to take into account the preferences of the women involved in commercial farming, in which women are increasingly involved. This is necessary as women may have different production preferences, even when engaged in the same productive activities as men. A study by WARDA in the Ivory Coast, for example, found that male and female farmers preferred different rice varieties: men preferred a variety which was shorter and higher yielding, but women preferred tall-statured varieties which were easier to harvest with babies on their backs (Gridley, 2002). It is therefore important that gender is explicitly included in extension research so that technology is developed to suit its primary users, whether male or female.

The impact of technology introduction on women is often unexpected, and is heavily influenced by existing patterns of power (Das, 1995). Agricultural extension which increases the intensity of agricultural activity can actually have a negative impact on women, for example. Technological advances that make cash crop farming more intensive often have the secondary effect of increasing women’s workload.

More intensive farming can increase the amount of associated ‘women’s work’ such as weeding, and associated environmental damage often means that women must travel further and spend more time to complete household chores such as wood and water gathering (Haug, 1999; Chipeta, Christoplos and Katz, 2008).

According to UNDP Human Development Report (1996), in the Philippines, women play a major role in agriculture, mostly as unpaid family workers or self-employed farmers, although about 17 percent are wage and salary workers. The crops with the largest number of women workers are rice, green grams and banana. In most farm systems, men and women share the same tasks. While there is considerable overlap and flexibility in the division of labour, men tend to be involved more in, applying fertilizers, repair and maintenance of infrastructure and irrigation, while women are responsible for much of the planting, weeding, harvesting, threshing and processing. The main factor attributing to the differences in the division of labour is the disparity in the quality and relevance of education offered to women and men. Because of customary and cultural issues men tend to get education that is relevant to their mechanical tasks in the farm while women playing their roles without enhancing their capacity. Women mostly participate in agricultural production, agricultural education and extension services ought to be offered to them.

2.5 Theoretical Framework

Human capital theory suggests that education or training raises the productivity of workers by imparting useful knowledge and skills, hence raising workers’ future income by increasing their lifetime earnings (Becker, 1964). Becker (1964) and Mincer (1974) provide an explanation that links investment in training with workers’ wages and output. In particular, their theory draws a crucial distinction between general education and firm-specific training. Over the past thirty years or so, hundreds of studies have been conducted to estimate rates of return to education (RORE); most such studies show that formal schooling is a crucial factor in explaining variations of salary and wages in well developed countries (Cohn & Addison, 1998).

Human capital theory rests on the assumption that formal education is highly instrumental and necessary to improve the productive capacity of a population. In short, human capital theorists argue that an educated population is a productive population. Human capital theory emphasizes how education increases the

productivity and efficiency of workers by increasing the level of cognitive stock of economically productive human capability, which is a product of innate abilities and investment in human beings. Human Capital Theory (HCT) concludes that investment in human capital will lead to greater economic outputs however the validity of the theory is sometimes hard to prove and contradictory. In the past, economic strength was largely dependent on tangible physical assets such as land, factories and equipment. Labour was a necessary component, but increases in the value of the business came from investment in Human capital (Becker, 1993).

According to Babalola (2003), the rationality behind investment in human capital is based on three arguments: The new generation must be given the appropriate parts of the knowledge which has already been accumulated by previous generations, the new generation should be taught how existing knowledge should be used to develop new products, to introduce new processes and production methods and social services, people must be encouraged to develop entirely new ideas, products, processes, and methods through creative approaches. This theory was relevant to this study in that it aims at stressing the importance of quality and relevant education to women on agricultural production and more so green gram production irrespective of their level of basic education. The theory highlighted the need for training of women on agricultural production and thereby imparting useful knowledge and skills in green gram production.

2.6 Conceptual Framework

Based on the theoretical framework on human capital and its relationship with education of women in agricultural production, the study presents a conceptual framework. Authors have given diverse views on women's level of education, the training opportunities available for women, the relevance of training opportunities for women, women knowledge and skills and their influence on green gram production. From a theoretical point of view, it is notably hardly possible to integrate this existing variety of conceptual orientations, choices, and boundaries into a single conceptual framework. Therefore, we prefer to reposition a number of these variables and processes into a new conceptual framework, that serves as a guide to integrate theoretical perspectives that interlink these variables and processes and help to explain impact of education of women on green gram production in Elgeyo Marakwet County. The framework will help understand women as a human capital necessary in

green gram production. Their output in land preparation all the way to marketing intensifies their role in green gram production.

Especially with the fact that studies will reuse a number of research instruments that builds on this big variety in concepts, requires us to be on clear how the original concepts are repositioned within the conceptual framework for our studies. As such the study will adopt the following conceptual framework.

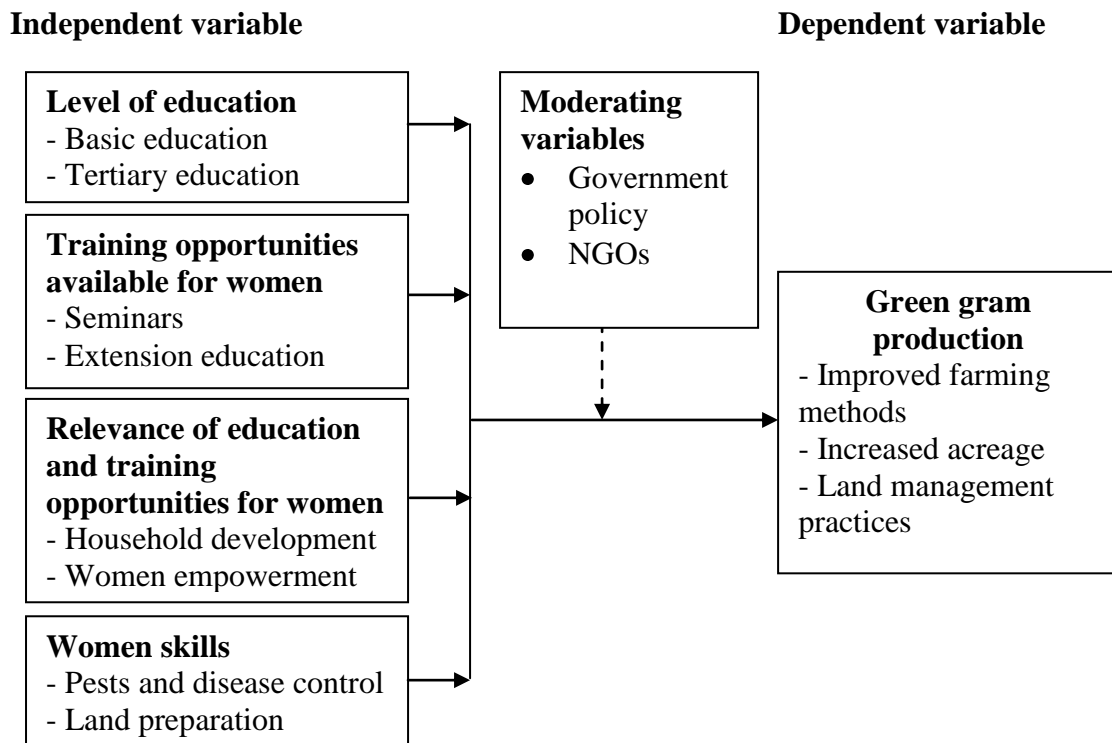


Figure 2.1 Conceptual framework

The independent variables for the study comprised of; level of education of respondents, training opportunities available for women, relevance of education and training opportunities for rural women and women skill in production of green gram. The dependent variables is the household green gram production yield which is explained through; acreage under green gram, better land management practices, adoption of improved farming practices and total yield expected from green gram crop. However, the NGO working in the area and government policy towards green gram production could also influence the green gram production in the area and therefore could act as moderating variables for the research.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter looked at the research design, the location of the study, the target population, sampling procedures, data collection instruments and procedures and methods of data analysis.

3.2 Research Design

According to Kombo and Tromp (2006), a research design can be regarded as an arrangement of conditions for collection and of data in a manner that aims at combining relevance with the research purpose. The study employed a descriptive research design. This approach aimed at collecting data without manipulating the research variables or the respondents in an attempt to assess the impact of education of women in the production of green gram in Elgeyo Marakwet County. The study chose this research design since inferences about relations among variables are made, without direct intervention from connected variation of independent and dependent variables (Patton, 2000). In this study, variables were investigated without any manipulation or alteration and descriptive methodologies were used.

3.3 Target Population

The study targeted 900 green gram farmers from Tunyo division in Elgeyo Marakwet County. It regarded the identified population as the relevant group about whom generalizations can be drawn (Arkava and Lane, 1983). This population is drawn from the Tunyo Division Agricultural Officer (2013) of which he attributed that most of the farmers were women; Mon location = 310, Arror location = 297 and Chesuman = 293. Tunyo Division Agricultural Officer, green gram traders and Area Education Officer acted as key informants for the study.

3.4 Sample Size and Design

Mugenda and Mugenda (2003) defined a sample design as a definite plan for obtaining a sample from the sampling frame. It refers to the technique or the procedure the researcher will adopt in selecting some sampling unit from which inferences about the population is drawn. Sampling design was determined before any

data was collected. Stratified sampling according to the locations was done after which systematic sampling was used to select the final respondents. In selecting the sample size, the following formula was used as proposed by Mugenda and Mugenda, (2003);

$$nf = \frac{n}{1 + \left(\frac{n}{N}\right)}$$

Where: nf = the desired sample size (when the population is less than 10,000)

n = the desired sample size (when the population is more than 10,000) =384

N = the estimate of the population size = 900

$$\text{Therefore } nf = \frac{384}{1 + \left(\frac{384}{900}\right)} = 269$$

Therefore, the final sample size for the study comprised of 269 respondents.

Table 3.1 below gives the breakdown per location of respondents.

Table 3.1 Target population

Location	Target population	Sample size
Mon	310	92
Arror	297	89
Chesuman	293	88
Total	900	269

Other key informants for the study were division agricultural officer, AEO and green gram traders.

3.5 Data Collection Instruments

The study applied questionnaires and interview schedules in data collection. There was a questionnaire that targeted both men and women farmers in green grams production and three different interviews scheduled for traders, MOE and MOA officials. A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents (Mugenda and Mugenda, 2003). The study considered using questionnaires because of its low cost, it was free from bias, respondents had adequate time to give out well thought answers and larger sample was reached and thus the results were more valid and reliable. These were a questionnaire for both men and women.

According to Frey and Oishi (1995) an interview is a purposeful conversation in which one person asks prepared questions (interviewer) and another answers them (respondent). This was done to gain information on the topic and it allowed the respondents to have control of the responses thereby giving insightful information that was never given before. In the study, there was an interview schedule for the division agricultural officer, MOE official and traders in green gram.

3.5.1 Pilot Testing of Instruments

In conducting the pilot study, the researcher was interested in establishing whether the respondent had the same understanding of the questions and thus would offer the information required. As (Mugenda and Mugenda, 2003) argue "...even the most carefully constructed instrument cannot guarantee to obtain one hundred percent reliable data". For the above reason the study undertook a pilot study to pre-test the reliability of the research instrument. This was done using the test - retest method. For the pilot study the researcher administered 15 questionnaires' to respondents in Chesongoch division of Marakwet East district. The main purpose of the pilot study was to check on suitability and the clarity of the questions on the instruments designed, relevance of the information being sought, the language used and the content validity of the instruments from the responses given by the respondent.

3.5.2 Validity of the Instruments

Validity concerns the soundness of the inferences based on the scores; that is, whether the scores measure what they are supposed to measure, but also not measure what they are not supposed to measure (Thomson, 2003 in Kline, 2005). The two most important forms of validity are internal and external validity. Content validity was used to measure extent to which measuring instrument provided adequate coverage of the topic as per the set themes in the study. The research supervisors helped in checking whether the instruments were reliable.

3.5.3 Reliability of the Instruments

Koul (2005) define reliability as the ability of that test to consistently yield the same results when repeated measurements are taken of the same individual under the same conditions, basically, reliability is concerned with consistency in the production of the results and refers to the requirement that, at least in principle, another

researcher, or the same researcher on another occasion, should be able to replicate the original piece of research and achieve comparable evidence or results, with similar or same study population. The variables were tested for reliability by computing the Cronbach alpha statistical tests where reliability coefficients around 0.90, are considered excellent, values around 0.80 as very good and values of around 0.70 as adequate. The reliability (r) value for the current study was 0.736 and this was considered to be fit according to Kothari (2004).

3.6 Data Collection Procedures

The data collection procedures involved a number of steps. First, the researcher sought research permit in writing to conduct the study from Tunyo Assistant County Commissioner. After the permission was granted, two research assistants were recruited and they were trained on how to carry out the data collection exercise. The researcher informed the study respondents about the data collection exercise and after consultation agreed on the date of commencement. The researcher together with the research assistants visited sampled households in Tunyo Division. The research instruments were administered to them and any clarification from them concerning the research questions were provided for. The research instruments were collected after the respondents finished filling them. For interview schedules, appointment was made prior to conduction of it. The study contacted the Tunyo division agricultural officer and a trader involved in green grams trade who acted as key informants for the study.

3.7 Data Analysis

The data was analysed using quantitative and qualitative approaches. Quantitative research method was used to analyse the data collected. Quantitative research permits specification of dependent and independent variables and allows for longitudinal measures of subsequent performance of the research subject (Meyer *et al.*, 1995). Statistical Package for Social Sciences (SPSS 17) aided in data coding, entry and analysis. The data was cleaned and analysed using descriptive and inferential statistic to determine and report the way things are and using indices that described a given sample such as; measures of central tendency mean, mode, median and standard deviation. Also inferential statistics analyses were used to analyse the results of the study. Inferential statistics involves the process of sampling and the

selection of a small group assumed to be related to the population from which it is drawn (Best and Kahn, 2003), inferential statistics was used to draw inferences about a given phenomenon in the population based on the results from a randomly selected sample, and to test hypothesis and enable the researcher generalize results from the sample of the population. Multiple linear regressions (MLR) were used to determine the impact of education of women on green gram production in Tunyo Division. The regression equation estimated was of the form; regression equation is a function of variables x and β

$$y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + \varepsilon$$

Where β_0 is the intercept, β_1 measures change in Y with respect to X_1 , holding other factors constant, β_2 measures the change in Y with respect to X_2 holding other factors constant, β_3 measures the change in Y with respect to X_3 holding other factors constant, β_4 measures the change in Y with respect to X_4 holding other factors constant.

Where in this context X_1 represents level of education, X_2 represent training opportunities available, X_3 relevance of training programmes X_4 represented the women knowledge and skills and Y represents green gram production.

3.8 Ethical Considerations

The researcher obtained permission to conduct the research from the assistant county commissioner's office before commencement of data collection. In addition, all respondents of the study were identified and recruited using the prescribed procedures after being taken through an introductory letter that requests permission to collect the information to give informed consent in writing. Respondents who were unwilling to participate received the same treatment. Moreover, information and data collected from the respondents was treated confidential and be only used for the study. It can only be accessed with full authority from the respondent.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1.0 Introduction

This chapter describes the impact of education of women on green gram production in Tunyo division. The data was collected through questionnaires and interviews. The qualitative data was organised in broad themes that answered the research objectives. Quantitative data was organised in frequency counts and converted to percentages for clear presentation.

4.1.1 Response Rate

A total of 235 respondents from all locations in the division out of a possible 269 responded to the research items, signifying a 87.36% response rate.

Table 4.1 Response ate

Location	Sample size	Response rate
Mon	92	85
Arror	89	78
Chesuman	88	72
Total	900	235

Other respondents who acted as key informants for the study comprised of; green gram traders, education officer and division agricultural official.

4.1.2 Demographic Information

The preliminary section of this study was done through administering of questions. The questionnaire captured data on the background of respondents in terms of age, level of education, acreage of land and gender.

4.1.3 Gender of the respondents

The study sought to know the gender of the farmers participating in green gram production; 59 (25.1%) were male while 176 (74.9%) were female. This is shown in Table 4.2.

Table 4.2 Gender of the respondents

Location	Gender		Total
	Male	Female	
Chesuman	18	54	72
Arror	22	56	78
Mon	19	66	85
Total	59	176	235

From the study it was confirmed that Mon was the highest in female respondents with 28% while Chesuman was the lowest with 23%. From the study it was noted that women participate more in green gram production than men in all locations.

4.1.4 Age category of respondents

The study sought to know the age bracket of the farmers participating in green gram production. Respondents were asked to indicate their age bracket as either below 30 years, 30-40 years and above 40 years. 114 (48.5%) respondents were aged between 30-40 years 63(26.8%) above 40 years and 58(24.7) below 30 years. This is described in table 4.3 below;

Table 4.3 Age category of respondents

Location	Age category			Total
	Below 30 years	30 - 40 years	Above 40 years	
Chesuman	15	38	19	72
Arror	17	37	24	78
Mon	26	39	20	85
Total	58	114	63	235

The study findings showed that most farmers in green gram production fall between 30- 40 years. Mon location was the highest in green gram farmers under this age bracket while Arror was the lowest. The findings show that most farmers engaged in green gram production fall under the active age bracket described by FAO (2009) as successfully engaging in agricultural production. The study therefore reveals that with all the other variables in place, women in Tunyo can successfully invest in green grams.

4.1.3 Education level of respondents

The study in this part sort to know the education level of the farmers involved in green gram production. Respondents were asked to give their education level as either

not educated, primary, secondary, college or university, 85 (36.2%) of the respondents were from Mon, 78 (33.2%) from Arror and 72(30.6%) from Chesuman. This is given in table 4.4 below;

Table 4.4 Education of respondents

Location	Level of education					Total
	University	College	Secondary	Primary	Not educated	
Chesuman	1	13	23	13	22	72
Arror	3	14	22	11	28	78
Mon	1	22	20	18	24	85
Total	5	49	65	42	74	235

The study revealed that 74 (31.5%) of the respondents were found to have no formal education with Arror having the highest number of 28 (37.8%). Illiteracy levels among women in green grams are highest in Arror and lowest in Chesuman with 22 (29.7). However, Arror has the highest percentage in farmers with university education with 3 (60%) while Chesuman and Mon having 1 (20%) each. This shows that illiteracy is a common problem among residents of Tunyo division in Elgeyo Marakwet County. In support of the findings of the study on the level of education of the farmers, one trader said that most of the women had not gone to schools or if they have, mainly gone to class 7 and or 8. He indicated that why they normally had issues understanding the concepts taught by the MOA in extension education. The learned and formally employed women do not participate much in green gram production or any other type of crop farming. The Ministry of Education official remarked that the a high percentage of women in Tunyo have primary school level of education and less, and few of them had secondary or tertiary level of education. This shows that education level of women in Tunyo division is still very low as described by green gram trader interviewed.

4.1.2 Respondent Acreage of Land

The study sort to find the acreage of land of farmers in green gram production Respondents were asked to give the size of their land under green gram production as either less than one acre, between 1 to 5 acres, 6 to 10 acres, 11 to 15 acres or 16 acres and above. The study showed that 99 (42.1%) of the respondent household land ranges between 1 – 5 acres, 24.7% said that their land size is less than 1 acre, 22.5%

said that their land sizes was between 6 – 10 acres, 6.4% indicated that their land was between 11 – 15 acres while 4.3% said that their household land size was 16 acres and above. This was as shown in figure 4.1 below;

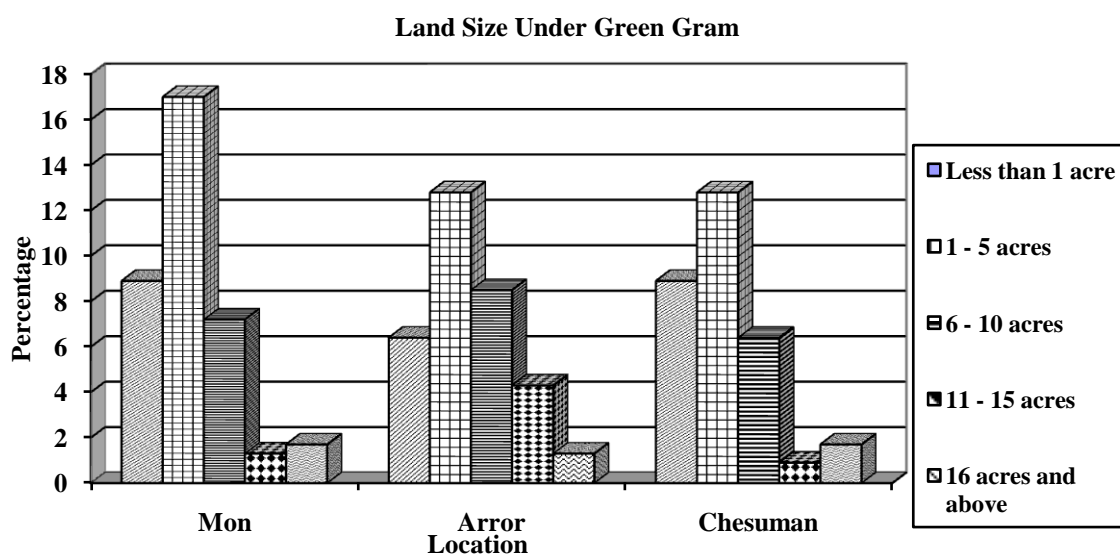


Figure 4.1 Household land size

Study findings revealed that the highest number of farmers had between 1- 5 acres of land dedicated to green grams. Mon location had the highest number of respondents with between 1-5 acres of land while Chesuman and Arror had the same number. While discussing on the acreage of land under green grams, the divisional agricultural officer indicated that between 1 to 5 acres of land is enough for a household to produce green grams for both commercial and household use since under ideal conditions one acre should produce 4 to 5 bags of green grams.

4.2.0 Education Level of Women and Green Gram Production

Food security and education are interlinked. According to Lindley et al. (1996) in order to meet the challenges of Agricultural production and food security facing African countries, improvement of a country’s human resource capacity for productivity is a pre-requisite. Both formal and non-formal education is essential for improving food security and rural development and thus reducing poverty. This compendium of FAO’s experiences with education and food for all shares descriptions of cases that can contribute to the process of enabling rural people improve their lives and livelihood. The study sought to find out the impact of education of rural women and production of green grams in Tunyo Division, Elgeyo Marakwet County. The study checks at how level of literacy; non-formal, primary,

secondary and tertiary education influence rural women involvement in green gram production under the following sub – themes;

4.2.1 Primary Education of Women and Production of Green Gram

Under this sub theme, the study sort to establish the relationship that existed between women who had primary level of education and extent to which they grew green gram as part of their main economic activity. In this case respondents were asked to say if they feel that their level of production is high, fair or low. A cross tabulation analysis was carried out to determine the relationship between rural women education and green gram production level in the division. The results are as presented in table 4.5 below;

Table 4.5 Level of education and green gram production level cross tabulation

Level of education	Green gram production level			Total
	High	Fair	Low	
Not educated	8	10	56	74
Primary	7	5	30	42
Secondary	13	19	33	65
College	20	8	21	49
University	3	0	2	5
Total	51	42	142	235

Study results on primary education shows that for those who had primary education, 30 (75.7%) of them said that their green gram production levels were low, 5 (11.9%) said that theirs was fair while only 7 (16.7%) said they had a high production level of green gram. This is at least more reasonable as compared to those who were found to have no formal education level whereby majority 75.7% production levels were low and only 10.8% had their production levels been high. This revealed that primary education level of rural women influence negatively on production levels of green grams. However, those who have high production levels were found to have gone through adult classes as mentioned by division educational officer’s interview who remarked that literacy sessions in Tunyo are offered once a month per each sub location and most of the participants are women. The classes enable women to acquire basic numeracy and literacy skills which in turn enable them to understand what they are taught in the extension education through the ministry of agriculture.

4.2.3 Secondary Education of Women and Production of Green Gram

Secondary education of women was also used to check its influence on production of green gram in the area. It was hypothesised that an increase in the respondents' education level automatically increased his /her green gram production levels. From the findings made in Table 4.2 above, it is clear that there is a significant reduction in low production levels (50.8%) on green gram production by farmers who had O – level education as compared to 71.4% who had primary level of education. It is also evident that 20% of those who had secondary education level green gram production were high. This leads to the conclusion that basic education is important in ensuring that rural women in Tunyo division realise increased production level in green gram farming. But the changing trend is based on the reason that currently agriculture is taught from secondary education and above. Formally, before the system was revised, it was taught even from primary school. But the area education officer indicated that they are now advocating for the county government to lobby with the national government to have it taken back to primary level. This would boost farmers' literacy levels towards adoption of sustainable agricultural farming practices.

4.2.3 EoW, Tertiary Education of Women and Production of Green Gram

Results on the relationship between the education of women and tertiary education level which included college and university reveal that there is an increasing trend of higher production levels of green gram, 40.8% of those who had college level of education to 60% for those who had university level of education. This implies that increase in education level of women raises the production levels of green gram in Tunyo Division. Further Pearson chi square statistics were computed to check the significance of the results as presented in Table 4.6.

Table 4.6 Chi-Square tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	31.066 ^a	8	.001
Likelihood Ratio	29.663	8	.001
Linear-by-Linear Association	21.312	1	.001
N of Valid Cases	235		

a. 3 cells (20.0%) have expected count less than 5. The minimum expected count is .89.

Chi square statistics shows that ($\chi^2=31.066$, $df=8$ and $p=0.001$) there exist significant positive relationship between education level of women and production of green grams in Tunyo Division. This means that a unit increase in education level of respondents would significantly increase green gram production. This shows that the level of education of respondents is a significant predictor of green gram production level in Tunyo Division. The findings are consistent with area education officer who commented that education is important in green gram production because *s because if* a woman does not know how to read, it would be very hard for her to buy chemicals used for green gram production. However, he opined that if the rural women were instilled well through extension education and training, the gaps that exist as a result of lack of formal education could be reduced. The division agricultural officer further remarked that education had direct impact on green gram production. The women with higher levels of education were able to embrace modern techniques in farming and thus achieve greater outputs. He concluded that since the level of education of rural women in Tunyo division was low everywhere, they tend to perform poor in any form of agriculture. This shows that to achieve maximum production, basic education is needed for rural women in Tunyo Division.

4.3.0 Training Opportunities Available for Women and Green Gram Production

Training acts as a catalyst through which people in a community learn new ways of conducting activities. As a result of the introduction of green grams in Tunyo division, training was necessary for them to ensure that they reaped maximum benefit from the project. As the first objective of the study sought to find out the influence of training opportunities available for women on green gram production in the area, the study set to look at how availability of extension education for rural women and attendance of seminars and workshops influenced green gram production in the area. The results are presented in the following sub – themes;

4.3.1 Extension education and production of green gram

There is a strong case to be made that agricultural skills training for smallholders is important in terms of creating rural growth and reducing poverty in Africa. It is widely acknowledged that agricultural skills training is an important part of enabling small subsistence farmers to produce the increased and reliable supplies of high quality outputs they need to benefit from higher-worth agricultural value chains. It has

widely been reported that women's access to extension services is also constrained by the fact that the majority of extension agents are men, as are the majority of contact farmers (World Bank, 2007a). The extent to which the gender of the extension agent matters differs significantly according to socio-cultural context. Therefore the study sought to find out the availability of extension services provided to women on green gram production in the area, the results are presented in Table 4.7 below.

Table 4.7 Extension education and production of green gram

Extension education provision to women on green gram production	N	Min	Max	Mean	Std. Deviation
There are few training opportunities for women on green gram production in this area through agricultural extension officers	235	2.00	5.00	4.6255	.78731
Government extension officers are reluctant to provide training services to women on green gram production	235	2.00	5.00	4.4638	.74088
There are few extension personnel on the ground to train women on green gram production	235	2.00	5.00	4.0979	.46570
Valid N (Listwise)	235			4.395733	0.66463

Result show that almost all respondents strongly agreed (M=4.625 and SD=0.78) that there are few agricultural training opportunities for women on green gram production in Tunyo division through the division agricultural extension officers. This implies that women are rarely provided with training programmes on how to improve their yields on green gram production. They also strongly agreed (M=4.5 and SD=0.7) that government agricultural extension officers are reluctant to provide training services to women on green gram production in the area. This shows that there is a slow response by the government agencies responsible for providing information and assistance to farmers on how to improve on green gram cultivation practices. More, study findings reveal that the respondents also agreed (M=4.1 and SD=0.46) that there were few personnel on the ground to train women on green gram

production. The results were also supported by the division crops officer who indicated that the ministry does not have adequate personnel to train women on green gram production. He indicated that they offer group training because of the shortage of staff and because the farms are scattered thus hard to reach to each individual farmer. We offer training on technical expertise only. In addition, the officer said that they offer training on technical expertise only during the field visits. Once in a while when they got support from donors or NGOs like African Development Bank and KVDA, (Kerio Valley Development Authority) among others, they randomly select farmers for seminars, exposure visits and workshops. Most of the time took literate farmers with exemplary performance in green gram production and the rest came to learn from them through the group extension visits. In this case, the officer argues that shortage of staff is the likely reason that inadequate extension services are availed to women on green gram production in the area. Another aspect that could explain the findings is that, male extension agents are less able to reach female farmers, as cultural and social restrictions on interactions between genders may constrain or even prohibit the kind of contact which extension training entails. Cultural attitudes among male extension agents may also limit the importance they attach to women's extension education, and they may lack understanding of their priorities and training needs. One result of this is that male extension agents often spend less time talking to female farmers than male farmers.

4.3.2 Seminars and workshops and production of green gram

Seminars, workshops and field trips are important training areas through which rural women engaged in green gram production can further their knowledge and skills towards sustainable farming practices. The respondents were asked to give their opinion on a Likert scales of five starting from strongly agree to strongly disagree on the extent to which training seminars, field trips, and attendance of workshops influenced their production of green grams. Descriptive analysis results are presented in Table 4.8.

Table 4.8 Descriptive Statistics on Seminars and workshops and production of green gram

Statements	N	Min	Max	Mean	Std. Deviation
Seminars and workshops on green gram production are held irregularly	235	1.00	5.00	4.2426	.86027
Seminars and training fair opportunities are not accessible to all women who are involved in green gram production	235	1.00	5.00	4.2298	.79955
Seminars, workshops among other training opportunities available are costly for women	235	1.00	5.00	3.4298	1.31330
Valid N (Listwise)	235			3.9674	0.99104

Results show that the respondents agreed that (M=4.24 and SD=0.86) despite the existence of few training programmes for women, the seminars, workshops and field studies are usually held irregularly thereby limiting the participation of women on such important gatherings. Furthermore, the respondents also seemed to agree (M=4.2 and SD=0.8) that training opportunities are not accessible to all women who are involved in green gram production. This shows the weakness of the agricultural officers in identifying all women within their area who grow the crop and this could be a reason why some women interviewed could not distinguish the benefits of using recommended seedlings for planting of the green gram as they have attended few seminars on the green gram crop husbandry practices.

Lastly, there were mixed perceptions (M=3.42 and SD=1.31) that training seminars and workshops available for green gram production were costly for women. The standard deviation result showed that some respondents agreed that the few seminars and training opportunities available were costly for women on green gram production on the issue of fees charged during training and transportation costs and this made a number of women not to attend those meetings since money was an issue in their households. In conclusion to these findings, with a mean of (M=3.96) and a standard deviation (SD=0.99), respondents agreed that there are few training seminars available for women in the division and this could be a factor explaining the decrease yields together with poor crop practices being employed by farmers in the area. The

Division Crops Officer further said that they trained women on groups rather than on individual capacity and this could be the reason why many women in the study complained of few job opportunities. However, the officer was quick to stress that they had demand driven extension especially when we realize that there is an issue at hand e.g. pest infestation. The criteria for choosing women to train are that they should be in a group and not as individuals. This shows that the extension officers resort to training women groups when a disaster or emergency situation has occurred rather than training women first before engaging in green gram production.

4.3.3 Organisations Responsible for Training of Women in Tunyo Division

The study sought to know the organisations that are responsible for training women on green gram production. The respondents were asked to indicate the organisations that provided training to farmers in Tunyo Division. The analyses of results are given in Table 4.9 below

Table 4.9 Organisations Responsible for Training of Women in Tunyo Division

Organisation	Frequency
NGOs/CBOs	187
Banks/Microfinance Institutions	172
Women Groups	144
Church	40
Agricultural Finance Corporation (AFC)	10
Ministry of Agriculture	5

The study results of the study show that 187 (79.6%) of respondents relied on training from NGOs or CBOs like World Vision on training for green gram production, 172 (73.2%) said that micro finance institutions like Kenya Women Finance Trust (KWFT) and African Development Bank (ADB) provided training for women on green gram production, 144 (61.3%) said that training comes from women groups, 40 (17%) said church offers training programmes, 10 (4.3%) said that AFC offered training while only 5 (2.1%) acknowledged to receive training from agricultural extension officers from ministry of agriculture. The results therefore confirm that government agencies do not provide training for women involved in green gram production in Tunyo Division, Elgeyo Marakwet County.

4.4.0 Relevance of Training Opportunities for Women on Green Gram Production

Considering the study findings have shown that inadequate training is provided to women who practice green gram production, the second objective of the study sought to find out the respondents perception towards relevance of such training for women involved in green gram production. The availability of training opportunities on seminars, meetings, workshops or field studies could in one way or another influence food security, women empowerment and household development at large. The results of the analysis are discussed in the following sub sections according to specific themes.

4.4.1 Food security and production of green grams

Food security is important to ensure that issues of famine, hunger and diseases are prevented in society. With the global population expected to increase to nine billion by 2050, food security is of paramount importance to countries everywhere. Failure to address food security concerns could cause political instability in many parts of the world. The study sought to find out respondents perception towards the contribution of training programmes towards poverty reduction in the community as one of the ways of addressing food security issues in the community. Results are presented in Figure 4.2.

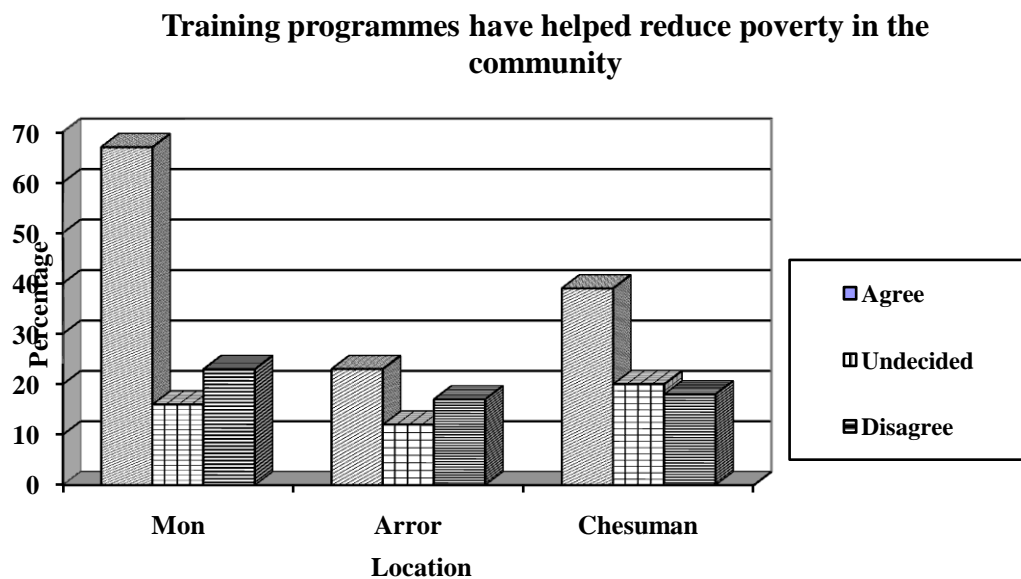


Figure 4.2 Food security and production of green grams

The result reveal that at least half 54.9% of respondents agreed that poverty reduction has been witnessed as a result of women attending training forums on poverty reduction although 24.7% of them disagreed with the statement and this could be due to the fact that they had not attended any training programmes in their locality. This shows that there has been a shift in food security situation where the society can now be able to have great harvests which maintain their food security during the dry seasons. The district officer supports the information given by the respondents by indicating that training has greatly increased the yields of the women farmers in green production. The use of modern farming techniques by these women has greatly been as a result of the trainings that they have had over time. The households are increasingly becoming food secure and for more than 2 years now, the government has ceased issuing relief food to the residents of Tunyo division. This shows the relevance of rural women understanding of current methods of green gram aimed at achieving maximum production for ensuring food security issues have been addressed.

4.4.2 Women empowerment and production of green grams

Women play a critical and potentially transformative role in agricultural growth in developing countries, but they face persistent obstacles and economic constraints limiting further inclusion in agriculture. The study sought to find out respondents perception towards the contribution of women education through training programmes towards empowerment of women on green gram production in Tunyo Division. The results are as presented in Table 4.10.

Table 4.10 Relevance of Training Opportunities for Women on Green Gram Production

Relevance	N	Min	Max	Mean	Std. Deviation
It has empowered women in the community	235	1.00	5.00	4.2681	1.12491
It has encouraged women to engage in different agricultural activity	235	2.00	5.00	4.0851	.79609
Has changed the community perception towards women	235	1.00	5.00	3.7745	1.10370
It has created job opportunity to women in the community	235	2.00	5.00	3.5234	.86385
Valid N (Listwise)	235	2	5	3.9128	0.9721

The study revealed that majority of respondents agreed (M=4.267 and SD=1.12) that training opportunities available to women on green gram production has empowered women in the community. This shows that training opportunities provide a forum for women empowerment in Tunyo Division. Moreover, rural women tended to agreed (M=4.08 and SD=0.79) that training opportunities available have encouraged women to engage in different agricultural activity. A (M=3.77 and SD= 1.10) also agreed that as a result of women attending training programmes on green gram production, the society perception towards women has changed. Now women have the ability of operating business and owning properties, something that they were not used to in yester years. Finally, through a means of 3.52 and standard deviation of 0.86, respondents agreed that the training programmes have created job opportunity to women in the community; the result implies that women can now engage in diverse business activities as a result of attending training seminars conducted within their area. Based on the results above, training opportunities provide opportunities for community development through women empowerment and diversification of economic activities. This would lead to better food security, health, literacy rate and finally economic development of households.

During interview sessions with the division crops officer he noted that the women have a positive attitude towards the training because they majorly depend on the green gram for the livelihood and thus take keen interest on the training. The crop

also has a high demand in the market. The result confirms respondents perception regarding the benefits accrued from training opportunities being offered for green gram production in the area. Further the officer explained that through the few training programmes that they have organised for women involved in green gram production is that; it has enabled the women to embrace new forms of technical expertise e.g. use of fertilizers and machinery in weeding, harrowing and ploughing thereby improving the yields from 3 bags an acre to more than 5 bags.

Also the trader interviewed on green gram production in the area said that training and education opportunities have changed the lives of the farmers who grow the crop because really would they fail to harvest and return the input. She wished that farmers get more knowledge and skill so as to improve on the green gram production output. This underscores the need for training of women on green gram production as it seems to uplift their standards of living.

4.4.3 Household development and production of green grams

This objective sought to find out the impact of education and training of women on green gram production towards improving household development. The findings are shown in Figure 4.3.

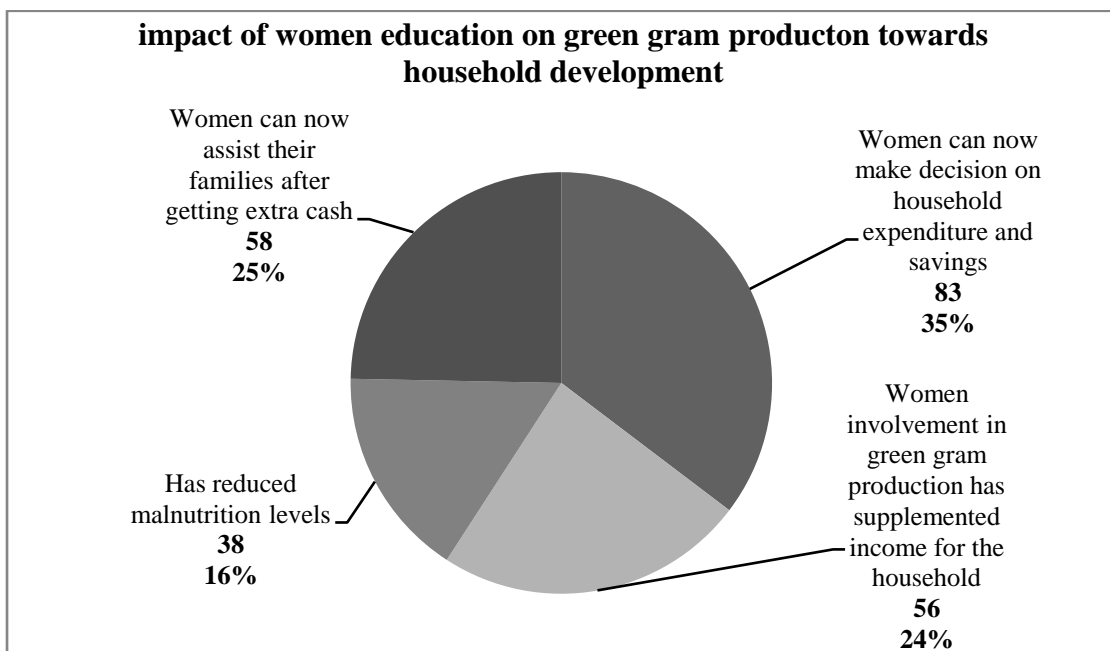


Figure 4.3 household development and production of green gram

The study specifically sought to find out how women household roles have changed as a result of attending training programmes on green gram production. Findings show that as a result of women attendance of training programmes, 35% of them can now make decision on household expenditure and savings, 25% said that women can now assist their families after getting extra cash may be in terms of paying school fees and other household items, 24% said that women involvement in green gram production has supplemented income for the household while 16% indicated that malnutrition levels have decreased indefinitely in most households as a result of women involvement in green gram production.

The division crops officers highlighted that women being the majority of the household heads in this area, are increasingly gaining potential in the provision of the family's basic needs. Women are now able to pay their children's fees as well as catering for their clothing needs. The result confirms the increasing interest that women have towards adoption of new technology and methods on agricultural production as it raises their empowerment in the community, provide buffer during the dry seasons and contributes much in development of households in the area.

4.5.0 Impact of Women Knowledge and Skills on Green Gram Production

This is the third objective of the study that sought to find out the impact of rural women knowledge and skills on green gram production in Tunyo Division. As it is known, skills and knowledge in agricultural farming is critical in ensuring good yield in crops.

4.5.1 Land preparation methods and production of green gram production

Land preparation methods include harrowing, ploughing and weeding that rural women need to acquaint themselves with these practices to ensure good crop husbandry practices for achievement of maximum green gram production. The results are presented in Table 4.11.

Table 4.11 Land preparation methods and production of green gram production

Impact of inadequate land preparation methods	N	Min	Max	Mean	Std. Deviation
Lack of basic skills on farming practices like harrowing, weeding among others by women affect green gram production	235	2.00	5.00	4.5404	.61452

Result shows that inadequate skills (M=4.54 and SD=0.61) on land preparation methods like ploughing, weeding and harrowing on green grams affected the production levels of crop in the study area. The division crops officer acknowledged that farmers' skills in land preparation methods were wanting. He insisted that the skills attained through extension education, whereby demonstration is applied has helped farmers enhance their capacity on land preparation. Timely preparation of land is a very important aspect of land preparation that women in Tunyo have greatly attained. Because of the little amount of rainfall experienced in Tunyo it is very important to prepare the land early enough and to plant immediately after the rains fall to maximise outputs. This implies that most women in the division were unaware of the appropriate land preparation practices for production of green grams. In one case few farmers practiced crop rotation in the lands thereby increasing chances of disease transmission from one crop generation to the other. The limited skills in land preparation methods could be the reason why low yields were achieved in most farms within the division.

4.5.1 Disease and pest control and production of green gram production

Enough skills on disease control and pest is important to ensure that good harvests are achieved after growing of green grams. Cases of disease and pest attack have been reported in the area and this has resulted to poor production levels on green gram and stunted growth amongst green gram plants in the area. The control of these pests and diseases lie on rural women skills on seed selection, skills on diseases and pest control practices. Farmers were asked whether inadequate skills on seed selection, control of pest and management of diseases were a hindrance towards green gram production in the area. The results are presented in Table 4.12.

Table 4.12 Disease and pest control and production of green gram production

Skills	N	Min	Max	Mean	Std. Deviation
Low level of skills by women on disease and pest control influence green gram production	235	2.00	5.00	4.5404	.61452
Lack of knowledge on seed selecting by women influence green gram production	235	1.00	5.00	4.4426	1.05809
Valid N (Listwise)	235	2	5	4.4915	0.8363

Result show that a majority (M=4.5 and SD=0.61) of women strongly agreed that low level of skills by rural women on crop disease and pest control influence green gram production levels in Tunyo Division. Respondents complained that they are usually not aware of the right pesticide or insecticide to use in controlling pest and disease infestation in their households. In addition, most 202 (85.9%) of respondents agreed that lack of knowledge on seed selection by women influenced green gram production levels in their area. The results corroborate with ministry of agriculture official interviewed who remarked that rural women control capacity on pest and disease control is wanting. However, the women use the local language in identifying pests and diseases. The group extension education has helped create awareness on the prevention and control of pests and diseases in green grams.

The result implies that majority of farmers in the area are not aware of methods of controlling pest and diseases. Despite the ministry of agriculture official indicating the use of local (Marakwet) language in identification of pests and disease, some of the pests and diseases are new and therefore most of them did not have knowledge about them thereby affecting plant growth and yield.

4.5.1 Cropping systems and production of green gram production

Researchers acknowledged that green gram are not supposed to be grown for more than one season in one particular of land to minimise chances of toxic residues and transfer or disease organism from the previous crop. Therefore the study sought to find out whether women skills on cropping systems; ensuring good plant growth and

nutrition, spacing systems and adoption of improved technological practices influenced green gram production in the area. The results are presented in Table 4.13.

Table 4.13 Descriptive statistics on EoW, cropping systems and production of green gram production

Impact	N	Min	Max	Mean	Std. Deviation
Lack of relevant skill and competence on plant nutrition and growth affect green gram production	235	2.00	5.00	4.5149	.61567
Limited knowledge on standard spacing by women affect green gram production	235	2.00	5.00	4.4298	.62563
Limited skills on green gram improved technology practices affected green gram production in the area	235	2.00	5.00	3.8851	.73931
Valid N (Listwise)	235			4.3626	0.7306

Research result indicates that women lack competences and skills on plant nutrition and growth affect green gram production (M=4.5 and SD=0.6), the respondents also agreed that (M=4.4 and SD=0.62) that limited knowledge on standard spacing by rural women in Tunyo division influenced green gram production in the area and they also seem to agree with the statement that rural women limited skills on green gram technological practices influence production levels. The low yields being witnessed by women engaging in green gram production could be as a result of lack of necessary knowledge, basic skills and competence in growing the crop.

The result shows that low skills and inadequate competency on cropping systems by rural women in Tunyo Division could be a hindrance to favourable green gram production in the areas as explained by the trader interviewed who lamented that most of the farmers were women, simply because the men are majorly involved in alcoholism and idle talks. Women therefore participated in all the process from land preparation to marketing of the crop. The women however lacked the skill to

effectively participate in the production and you find that they use the traditional methods e.g. in weeding they use small Jembes held by hand.

The division crops officer also remarked that in cropping systems, women here apply monoculture when it comes to green gram production. However, the women with less than an acre of land use strip cropping whereby the grams are planted in strips with maize plants. Women who did agriculture in primary or secondary level of education take a short time to understand aspects of cropping but the ones with totally no formal education or who might not have taken agriculture at any level find it a bit complex to understand this aspects. Extension education has really helped bridge this gap. This shows that women knowledge and skills is critical to ensure successful achievement of green gram project objectives in the areas. Stakeholders in the project need to come together and structure on ways through which the trend could be reversed.

4.6 Challenges Faced by Women in Green Gram Production

This part sought to find out the challenges that women faced in green gram production. These challenges could be based on personality characteristics, economic environment, social environment or even physical environment. The respondents were required to rate their level of agreement on a five point Likert scale on the challenges that they encountered in green gram production. The results are presented in Table 4.14.

Table 4.14 Challenges faced by women in green gram production

Challenge	N	Min	Max	Mean	Std. Deviation
Distance to the extension office limit many women to go for such training forums due to their family engagements	235	2.00	5.00	4.4213	.61078
Ineffective extension services and coverage	235	3.00	5.00	4.2766	.56622
Cultural barriers limiting women from pursuing green gram production	235	1.00	5.00	3.6809	1.29275
Negative attitude by women on education and training opportunities available	235	1.00	5.00	3.1447	1.39456
Inadequate support of women by their husbands or families on gaining knowledge and skills on green gram production	235	1.00	5.00	3.1191	1.25858
High costs of training on green gram production	235	1.00	5.00	2.9702	1.16353
Valid N (Listwise)	235	2	5	3.6021	1.0477

Findings as to whether negative attitude by women on education and training opportunities influence green gram production in Tunyo Division, the result show a divided opinion (M=3.14 and SD=1.39) whereby some respondents indicate that women negative attitude towards learning prevent them from attending training workshops for green gram production while others said that if the training programmes were available, they could attend. A mixed opinion was observed whereby at least half (M=3.12 and SD=1.25) of respondents agreed that inadequate support of women by their husbands or families prevented them to gain knowledge and skills on green gram production. This shows that some household head encourage their women to go for training forums on green gram production while others do not.

This could be a contributing factor to reduction in green gram acreage yield in a particular season.

Since training opportunities were not available to women engaged in green gram production, the respondents disagreed ($M=2.97$ and $SD=1.16$) with the statement that high costs of training on green gram production was a challenge to women. This implies that there are women who perceive that training costs are usually beyond their reach thereby hindering their knowledge and skills acquisition on green gram production. In addition to that almost all of respondents tended to agree ($M=4.27$ and $SD=0.56$) ineffective agricultural extension services and coverage as a hindrance to women education on green gram production. This is also evidenced in the previous results that showed that inadequate number of staff at divisional headquarters of ministry of agriculture slowed down training opportunities and programme for women on green gram production in the area.

Moreover, findings of the study showed that majority of respondents strongly agreed ($M=4.42$ and $SD=0.61$) that distance to the extension office limited many women to go for training on green gram production due to their family engagements. This is was found to be the major hindrance towards women education on green gram production in Tunyo Division. Likewise, of respondents seemed to agree ($M=3.68$ and $SD=1.29$) that cultural barriers within the community limited women education on green gram production.

On conclusion to the above challenges, descriptive analysis (measures of central tendency) result showed that the biggest challenge faced by women in acquiring knowledge and skills were; distance to the agricultural resource centre and ineffective extension services and coverage provided by the district crops officer. The least challenges encountered by women in seeking education and training opportunities on green gram production were support from their husbands together with high costs of training on green gram production. other challenges that respondents indicated through open ended questions were; lack of skills on how women should conduct irrigation during the period of dry weather (2.1%), women lack of proper knowledge on quality of seeds and environmental conditions (3.8%), some rural women observe that green gram production was a preserve of men who were educated (2.1%) and some women were unaware of the planting season (3.8%). The result reinforces the need for intensive and regular training for women on green gram production in Tunyo Division.

On his part the division agricultural officer identified the following challenge as a hindrance to provision of agricultural extension services to women in Tunyo Division on green gram production observed that language barrier is a challenge since most of the women are illiterate and only speak Marakwet using agricultural language might hamper their understanding of the lessons. There are also no Agricultural extension officers that speak Marakwet at the moment. Another governmental challenge highlighted by the division agricultural officer was that the government does not have enough trained agricultural extension officer to fully meet the demand. It's like enrolment to the technical courses like agricultural extension has gone down thus hampering deployment.

The societal challenge identified by the officer was the dependency syndrome is quite high in the community. The rural women would want the government to provide both extension education and farm inputs at the same time. Again the level of education of most women has also been a challenge as they take quite some time to grasp lessons that need a bit of theory. Men also do not support women in their agricultural endeavours, it thus becomes very hard for the women to fully realize their potential as they cannot access credit facilities and neither can they merge farms for greater output. This shows that the challenges are experienced both on the government, personal and societal perspective.

4.7 Impact of Education of Women on Production of Green Grams in Elgeyo Marakwet County

This is the major purpose of this study that seeks to find out how the education of women; based on their education level, training opportunities available, relevance of training opportunities and the influence of women knowledge and skills towards green gram production. To compute the results, a multiple regression analysis was computed and the results are presented in the following tables;

Table 4.15 (a) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.784 ^a	.615	.608	.46394

a. Predictors: (Constant), knowledge and skills, education level, relevance of training, training opportunities

Since the value ranges between 0 and 1, an R of 0.784 shows that predictors in the model are highly correlated to the dependent variable. Therefore the factors included in the model were appropriate. The R^2 in this model was found to be 0.608 which meant that the three predictors could explain 60.8% of the variation in green gram production. Since the adjusted R^2 is above 40% then it is considered high and reliable, this model could therefore explain a lot of the variation in the dependent variable.

Table 4.15 (b) ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	78.938	4	19.734	91.687	.000 ^a
	Residual	49.505	230	.215		
	Total	128.443	234			

a. Predictors: (Constant), knowledge and skills, education level, relevance of training, training opportunities

b. Dependent Variable: green gram production.

The ANOVA results shows that the model is fit ($p < 0.05$). This suggests that there exist linear relationship in the population between the independent and dependent variables. This suggests that at least one of the population partial regression coefficients of the predictors is not 0, and the population for the multiple R^2 is not 0.

Table 4.15 (c) Coefficients^a

Model		Unstandardized		Standardized		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.760	.288		2.637	.009
	Education level	.138	.026	.221	5.300	.000
	Training opportunities	.472	.050	.410	9.369	.000
	Relevance of training	.092	.039	.099	2.373	.018
	Knowledge and skills	.525	.050	.463	10.569	.000

a. Dependent Variable: green gram production

Using the constant and the β coefficient of educational level (x_1), training opportunities available, (x_2), relevance of training opportunities (x_3) and women knowledge and skills (x_4), an estimated prediction (regression) equation for this model can be written as follows;

$$y = 0.760 + 0.138x_1 + 0.472x_2 + 0.092x_3 + 0.525x_4$$

The partial regression coefficient (β coefficient) indicates the individual contribution of a predictor in the variable. In this model, the partial regression coefficient for education level was 0.221 which is a simple estimate of the parameter. This shows that when education level increases by one unit, green gram production increases by about 22.1% when other variables are kept constant. The same happens to other variables in the model presented above. This leads to the conclusion that education of women on green gram production is necessary for women in Tunyo Division.

4.7.1 Suggestion on the Improvement of Education of Women on Green Gram Production

The respondents suggested various measures to be taken to reverse the trend of education, skills, training and competence of women in the production of green gram in Tunyo Division, Elgeyo – Marakwet County. The respondents suggested the need to have village forums instead of group forums so as to reach out to all the women and thereby having a common interest group. Apart from the technical knowhow or skill, it's important that these women and also men be taught on the profitability of green grams so that the men would support it wholly and the women would stop depending on external support on the production. The green gram trader also suggested that there is need for enhanced extension education and farmers to group so as to improve marketing through increasing yields and also to help mobilize for group extension education

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter describes the summary of the findings, conclusions, recommendations, suggestions for further research and of the study's contribution to the body of knowledge.

5.1 Summary of Findings

The study was informed on the continued decline in agricultural production on green gram crop variety in Tunyo Division. The study specifically sought to find out the contribution of rural women education level, training opportunities available, relevance of training opportunities and influence of rural women knowledge and skills on agricultural production in the area. The study also sought to find out challenges experienced by women, agricultural officers and society in general in provision of training for improvement in the production capacity of the crop. The study involved the participation of 235 households' members of which 75% were women while 25% were male. The division crops officer and one green gram trader were also contacted upon to supplement the data provided. They acted as key informants for the study. The data was collected through the use of open and ended questionnaire and interview schedules for key informants. The data collected was analysed using descriptive statistics and inferential statistics (chi square and multiple regression analysis). The general findings of the study showed that education and training for women is critical for successful improvement of green gram production in the area. Results of the study showed that green gram production in the area had been low.

At first, the study established that majority of the persons who participated in the study had primary level of education. This greatly influenced their ability to grow green gram. The results of the study showed that the as the level of education increased, green gram production also increased subsequently. Chi square results showed a significant positive relationship between education level of women and production of green grams ($p < 0.001$). Research findings further indicated that venture is very profitable to the farmer since there is always ready market for the green grams. However, lower yields prevented farmers in the area from benefiting from better prices for 90kg bag which ranged between Kshs. 10,000/= - 13,000/=. However, most

farmers in the area miss the opportunity of raking huge profits from the venture. Results of the study further indicated that women are the ones who were mainly involved in the production of the crop since their husbands are mainly involved in alcoholism and rarely participate in the production of the crop. Another reason explaining the decline in agricultural output could be related to land size dedicated to green grams, most respondents had land size of between 1 – 5 acres and they applied mono-cropping as opposed to intercropping thereby decreasing the size of the land under green gram.

The results of the second objective on the impact of training opportunities available for women on green gram production revealed that there are few training programmes for women on green gram production. Findings further showed that those training programmes available were held irregularly and some were costly making them not affordable to most women in the division. Regression results showed that training opportunities available influenced green gram production. This called for the need for stakeholders to find best ways through which information could be disseminated on green production in the area. The information was also confirmed by division agricultural officer who said that they are faced with personnel shortage together with lack of appropriate infrastructure resources to conduct training in the vast division. The few training opportunities available were provided by NGOs like World Vision, micro finance institutions (KWFT), commercial banks (ADB), women groups, churches, AFC and ministry of agriculture extension officers. This creates the need for increase capacity building of women in ensuring sustainable green gram production.

In addition the findings of the third objective of the study revealed that training opportunities are relevant for community development in the areas. As a result of provision of training opportunities for women in the division, the respondents strongly agreed that it has enabled women to be economically empowered making them to diversify and operate business, a practices they were not used before. They also said that through training and development, community is empowered and has changed women perception towards women. The roles of women have now changed as some of them are now the bread winners as a result of being involved in green gram production. The agricultural crops officers also noted that the lives of farmers have changed as a result of growing the crop suggesting that he

wished if all women had necessary knowledge and skills so as to improve agricultural output.

Moreover, results of the third objective showed that limited skills for women influenced green gram production in the area. Respondents cited low level of limited skills on disease and pest control, seed selection, land preparation practices, plant nutrition and growth knowledge and source of markets on green gram production were among the variables that hindered the growth and development of the crop in the division. The lack of necessary training on ways and means of producing the crop was a major barrier hindering the performance of green gram in the area. The key informants also reiterated that inadequate support for women from their husbands prevented them from acquiring knowledge and skills on green gram production in the division.

Findings of the study further showed ineffective agricultural extension services by ministry of agriculture officials, distance to the extension office and cultural barriers were major factors limiting women participation in green gram production in the area. Further trader interviewed said that women knowledge and skill were major challenges that faced them in growing of green gram as they did not know the appropriate time for planting, quality seed selection or even the soil to which one must choose to achieve maximum production of the crop. For division crops officer, he cited that poor language barrier between the officers most of who did not know the Marakwet language, a language spoken by majority of the locals rather than Kiswahili or English proved difficult in the dissemination of information concerning green gram production.

The respondent also indicated that shortage of staff being provided by the government was the reason behind provision of few training opportunities for women while he later lamented the community on dependency syndrome. Whereas the extension officers were mandated to provide information services, the community also expected the government to contribute in giving those inputs for green gram production for free. This dependency made most rural households not to engage in farming unless the government provided all the inputs (fertiliser, seeds, and pesticides) to facilitate the project. Limited knowledge and education level of women was also another challenge that women faced in the division on green gram production.

5.2 Conclusion

The study concludes that green gram production is a viable and promising project for people of Tunyo Division, Elgeyo – Marakwet County. Despite, low yields that farmers got from their venture, the crop was very profitable since a 90kg bag was fetching between Kshs. 10,000/= to 13,000/= compared to other crops being grown in the area. Multiple regression results showed that education of women on the crop influenced 60.8% of change in green gram production in the area ($p < 0.05$). The correlation was high suggesting that education of women on green gram production was critical to achieve high production level on the crop. However, results of the study showed that training opportunities were few for women in the division. This was acknowledged by division crops officer who said that due to shortage of personal and resources to conduct training, few women groups are the ones that have already benefited from the training on how to improve the crop yield in the division. Other organisation that were found to be providing training on the same were World Vision, churches, Kenya Women Finance Trust, African Development Bank, Agricultural Finance Corporation, Women Groups and Community Based Organisations.

The training opportunities available were also beneficial to individual rural women and community as a whole. They both contributed to household development, improvement in food security and women empowerment in the division. The perception that society held against women have now shifted and changed significantly. Results further showed that through training, women can now own and manage different business enterprises together with diversifying their income not only for green gram but other crops as well which have ready market in the neighbouring county. This response was corroborated by green gram trader interviewed and division crops officer.

Women knowledge and skills was also found to be a significant factor impacting on the growth and production of green gram in the division. Study results identified that majority of women had low level of education, others were illiterate, and few had limited basic skills on farming practices like harrowing, land preparation, harvesting, seed selection, marketing, plant nutrition and growth, pest and disease control or even weeding the crop. This influenced production of green gram negatively.

Challenges identified limiting education of women in green gram production were; inadequate support of women by their husbands or families on gaining

knowledge and skills on green gram production, cultural barriers, accessibility (long distance to the divisional headquarters), language barriers, shortage of ministry of agricultural personnel and ineffective agricultural extension services and coverage.

5.3 Recommendations

Based on the finding of the study, results have shown that women education is important to ensure high yields are gained from green gram production in Tunyo Division, Elgeyo – Marakwet County. Therefore, the study makes the following

5.3.1 Education status of women

There is need for introduction of adult learning centres in all location of Tunyo Division to assist in increasing rural women knowledge and understanding on green gram production.

5.3.2 Training opportunities for women on green gram production

There is need for constant and regular training of women in green gram production by the government and other stakeholders to ensure the objectives of the project are realised. The officer remarked that it is important that these women and also men be taught on the profitability of green grams so that the men would support it wholly and the women would stop depending on external support on the production. The government needs to address staff shortage at the divisional agricultural office that would be of great help to women in training them on good crop husbandry practices

5.3.3 Relevance of training on green gram production

There is need for rural women to be taken on agricultural excursion trips to learn from others farmers who have succeeded in green gram production. This could be facilitated through women being engaged in groups.

5.3.4 Women skills on green gram production

To ensure effective information dissemination to all women involved in agricultural production, stakeholders need to have village consultative forums on green gram production instead of group forums so as to reach out to all the women and thereby having a common interest group. This will ensure that women have enough skills and knowledge on the trends in crop production. Moreover, they need to come together as group so as to improve marketing channels through increasing yields and also to help mobilize for group extension education.

5.4 Suggestions for Further Research

Based on the findings of the study, the research makes the following suggestions for further research;

1. There is need for the same study to be conducted on a wider scope in Elgeyo – Marakwet County to determine the impact of education of women on green gram production bearing in mind that they are important stakeholders in the project
2. A monitoring and evaluation research needs to be conducted to ascertain the effectiveness of farming approaches used in green gram production and yields level.
3. A study should be conducted to determine other viable projects that can be implemented in the division to improve socio – economic development of the area

5.5 Contributions to the Body of Knowledge

The literature reviewed lacked emphasis women training through extension education and practical experience in the field. The study learned that extension education to all farmers involved in green gram production is important irrespective of their level of education. Table 5.1 present the summary of the implications of the study.

Table 5.1 Contributions to the Body of Knowledge

Objective	Contribution
Impact of education level of women on green gram production	Formal education has been found to be critical in sustainable agriculture. Women farmers are hampered in taking advantage of and using extension services and information because of low literacy rates or lack of access to basic education
2. Training opportunities available for women on green gram production	Inadequate provision of training services could be as a result of restriction for contact between men and women, since majority of extension officers were male, green gram farmers could not have access to them
3. Relevance of education of women on green gram production	Training is important for women as it would result to socio – economic empowerment of women involved in green gram production
4. Impact of agricultural skills attained by women affects green gram production in	Skills are essential to ensure that good crop husbandry practices are carried out effectively and efficiently to achieve maximum output

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APPENDICES

APPENDIX I: LETTER OF TRANSMITTAL

Paul Tonkei Kesery
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Dear Participants,

Thank you very much for your willingness to participate in this survey. This questionnaire is meant to find out your opinion on impact of education on green gram production in Tunyo Division, Elgeyo Marakwet County. Your responses will enable agricultural and other stakeholders understand the importance of women knowledge, education and skills in green gram production.

Your responses will be highly appreciated. Please note that all the information you provided will be treated as confidential and will be used only for this research work.

Thank you for your participation and effort in completing the questionnaire.

Yours faithfully,

Paul Kesery
University of Nairobi
Eldoret Extra mural centre

APPENDIX II: QUESTIONNAIRE FOR RESPONDENTS

Instructions

Please kindly respond to all items in these questionnaires

Put a (Tick) alongside the option that is most applicable to you or fill in the spaces provided

Do not write your name in this questionnaire

1.	Section A: Demographic Data Division that you come from Mon [] Arror [] Chesuman []
2.	Your age? Below 30yrs [] 30-40 Yrs [] Above 40yrs []
3.	Your sex? Please tick Male [] Female []
4.	Your level of Education? University [] College [] Secondary [] Primary [] Do not have formal education []
5.	Household land acreage size? Less than 1 acre [] 1 – 5 acres [] 6 – 10 acres [] 11- 15 acres [] 16 acres and above []

Section B: Training opportunities available for women on green gram production

6. On the following statements, whether you agree or disagree on how training opportunities available for women affect green gram production in your area

<u>Aspect</u>	<u>Response</u>	<u>Comments</u>
a. There are few training opportunities for women on green gram production in this area	Yes [] No []	
b. There are few personnel on the ground to train women on green gram production	Yes [] No []	
c. Training on green gram production are held irregularly	Yes [] No []	
d. Training opportunities available are costly for women	Yes [] No []	
e. Training opportunities are not accessible to all women who are involved in green gram production	Yes [] No []	
f. Government extension officers are reluctant to provide training services to women on green gram production	Yes [] No []	

7. Which other organisations provide training for women on green gram production.

Tick one or more that applies

Church [] Women groups [] Banks/Micro finances []
 NGOs/CBOs [] Any other (Specify) _____

8. Which training programmes have you attended?

Seminars [] Workshops [] Field visits []
 Demonstrations [] Any other (Specify) _____

Section C: Relevance of education and training opportunities for women on green gram production

9. On the following statements, indicate whether you agree on the relevance of training opportunities for women on green gram production in your area.

Aspect	Response		Comments
a. It has empowered women in the community on green gram production	Yes No	[] []	
b. It has created new livelihood to women in the community on green gram production	Yes No	[] []	
c. Has helped reduce poverty in the community	Yes No	[] []	
d. Has encouraged women to engage in different agricultural activity	Yes No	[] []	
e. Has changed the community perception towards women	Yes No	[] []	

Any other relevance (specify) _____

Section D: Women skills on green gram production

10. On the following statements, ticks whether you agree or disagree on knowledge and skills affect green gram production in your area.

Aspect	Response		Comments
a. Low level of education of women affect green gram production	Yes No	[] []	
b. Lack of formal education by women affect green gram production	Yes No	[] []	
c. Limited knowledge on source of funding by women affect green gram production	Yes No	[] []	
d. Lack of basic skills on farming practices like harrowing, weeding among others by women affect green gram production	Yes No	[] []	
e. Lack of relevant skill and competence in green gram production	Yes No	[] []	

11. How long have you engaged in green gram production

Less than 5 years [] 6 – 10 years [] 11 – 15 years []

16 years and above []

Section E: Challenges faced by women in green gram production

12. On the following statements, tick the educational challenges that women face on green gram production in your area.

<u>Aspect</u>	<u>Response</u>		<u>Comments</u>
a. Negative attitude by women on education and training opportunities available	Yes	[]	
	No	[]	
b. Inadequate support of women by their husbands or families on gaining knowledge and skills on green gram production	Yes	[]	
	No	[]	
c. High costs of training on green gram production	Yes	[]	
	No	[]	
d. Ineffective extension services and coverage	Yes	[]	
	No	[]	
e. Distance to the extension office limit many women to go for such training forums due to their family engagements	Yes	[]	
	No	[]	
f. Cultural barriers limiting women from pursuing green gram farming	Yes	[]	
	No	[]	

(b) Any other educational challenge that women face on growing green gram in this area (specify) _____

13. How else do you think education of women on green gram production would help improve the lives of people of Elgeyo Marakwet? _____

APPENDIX III: INTERVIEW SCHEDULE FOR MOA OFFICERS

1. What can you say about green gram production in this area of Elgeyo Marakwet County?
2. What can you comment about women participation in green gram production in this area?
3. Based on your assessment, what is the average land under green gram crop in this division?
4. Give your opinion on how different levels of education of women; no formal education, primary, secondary and tertiary influence the production of green grams in this area?
5. Do you offer training opportunities like seminars, workshops, field studies (visits) or barazas to individual women or groups on best methods of cultivating green gram? (Explain your answer)
6. Could you please explain the procedures and criteria of training women on green gram production in this area?
7. What is your opinion towards women training on green gram production in this area?
8. What is the relevance of women education and training on green gram production in?
 - (a) Food security
 - (b) Household development
 - (c) Empowerment of women

9. Which challenges do you face in provision of training services to women on green production in this are? (Personal, governmental or society)

Personal challenge

Governmental challenge

Society/women

10. How could education and training be improved for women engaged in green gram production in this area?

11. What can you comment on skills development as a result of training of women on the production of green gram in this area on the following

Land preparation

Cropping

Pest and disease

APPENDIX IV: INTERVIEW SCHEDULE GREEN GRAM TRADERS

1. What can you say about green gram production in Tunyo?
2. What can you comment about your customers and suppliers in green grams from Tunyo in terms of gender?
3. Basing on the price fluctuation of green grams what can you say about green gram production in this area? (Has it improved, remained the same or decreased)?
4. Comment on the quality of the green gram from Tunyo
5. Does the education level of woman influence green gram production? (For those who have primary, secondary or tertiary education in this area?)
6. How can you rate the skills of these women involved in green gram production?
7. Do you support training opportunities like seminar or barazas to individual women or groups on best methods of cultivating green gram? (Explain your answer)

APPENDIX V: INTERVIEW SCHEDULE FOR MOE OFFICERS

1. What can you say about the education status of the women in Tunyo
2. To what extent are adult literacy sessions offered in Tunyo and what is their place in green gram production?
3. At what levels of education is agriculture taught in schools?
4. In your own opinion, do you think the education level of a woman has any effect on the production of green grams?