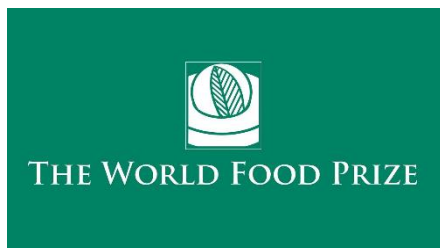


# An Investigation of How Farmers Promote Agricultural Production in Western Kenya



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## **Abstract**

According to [usaaid.gov](http://usaaid.gov), the agriculture sector employs more than 40 percent of the total population and 70 percent of the rural population (Agriculture and Food Security | Kenya | U.S. Agency for International Development, 2022). Farming is also a main source of income and food supply for many families in western Kenya. Agricultural production is increasingly impacted by factors such as climate change and the pandemic. However, it is extremely important because it affects the lives of so many. The questionnaire explores the ideas of what makes agricultural production successful. Additionally, several questions were asked to women and youth farmers. In Kenya, there are a limited amount of youth in the farming industry. In order to find out why and gauge a solution, there were several questions about how to make agriculture more appealing to the youth. Then, the farm to market experience was explored to see if it affects the productivity of the farm. Most of the participants expressed a price increase of seeds due to the pandemic. A majority of the participants felt that having a business plan will help them differentiate the loss and gains in their farm. Many of the farmers had short and long- term goals that ultimately benefited their family, health, and home. Finally, the farmers were asked about government assistance, and expressed their concerns and suggested possible solutions to their problems.

## Introduction

### ICIPE

International Centre for Insect Physiology and Ecology (ICIPE) was founded by Kenyan Scientist, Professor Thomas Risley Odhiambo. His vision was to have one central research center that had a permanent staff. It would also reach out to young researchers and interested scholars from around the world. Additionally, he wanted ICIPE to become a “powerhouse for the initiated and those wishing to be initiated into research” ([icipe.org](http://icipe.org)). ICIPE works to study insects to ensure food security and improve the health of communities in Africa. Their mission is to alleviate poverty and ensure food security and overall health of those in the tropics. They do so by analyzing and testing ways arthropods can affect the poverty rates. Additionally, they work to preserve the natural resource base around the research sites. They work to revolutionize the field of entomology while working to improve the circumstances that people are facing.

### Push Pull Technology

Professor Khan is a Principal scientist at the International Centre of Insect Physiology and Ecology. Professor Khan development of Push-pull technology stemmed from his work towards food security and environmental sustainability. Push-pull technology involves intercropping cereals with a pest repellent plant, such as Tick Clover (*scientific name: Desmodium*), which drives away or deters stem borers from the target food crop. An attractant trap plant, for instance Napier grass (*Pennisetum purpureum*), is planted around the border of this intercrop, with the purpose of attracting and trapping the pests ([icipe.com](http://icipe.com)). Consequently, the food crop is left unharmed and protected from pests.

## Agricultural Production in Western Kenya

The demand for agricultural production is prevalent and is the driving force of how most live. According to USAID.gov, “The agricultural sector is the backbone of the economy, contributing approximately 33 percent of Kenya’s Gross Domestic Product (GDP)” (Agriculture and Food Security | Kenya | U.S. Agency for International Development, 2022). As a driving force for the economy, it is especially important to understand the impacts it has on the farmers. Moreover, it is vital to understand whether that impact is positive or negative and how solutions can be made. Agricultural production in Kenya has been impacted over the years by the Fall Armyworm. Due to sciencedirect, we conclude that FAW has suddenly become a major pest in Kenya, causing losses of about a third of the annual maize production, estimated at about 1 million tonnes.

Additionally, climate changes and COVID-19 have largely affected how agricultural production. Many areas in Kenya had to experience lockdown restrictions due to the virus. Due to the lockdowns, many households are unable to buy or sell certain produce. According to poverty-action.org, nine in ten farming households report being worse off due to the pandemic (How Are Kenyan Farmers Faring in the Face of COVID-19?, 2022). Additionally, 26% of farmers have lost at least one source of income compared to the same time last year ((How Are Kenyan Farmers Faring in the Face of COVID-19?, 2022). Ultimately, it is essential for farmers to evaluate their farming experience and assess what is affecting their production.

The main specific objectives of my study include:

1. To analyze if the perceptions of the agribusiness sector have changed since the start of their farming career.

2. To analyze how knowledge and planning of a farm has impacted smallholder farmers in western Kenya
3. To evaluate the farm-to-market experience for farmers in western Kenya. (How are they different for women and youth?)
4. To assess the need for local agricultural programs that help educate farmers about the agribusiness sector

The goal of this research is to investigate agricultural productivity in parts of western Kenya and to ultimately determine if there is a need for additional assistance. The results of this research provided insights into agricultural productivity in Western Kenya and serves as evidence that additional assistance is needed for successful improvements in the agricultural industry.

## **Methodology**

### Participants

The study included thirty-one farmers from several different regions in western Kenya. A majority of the participants were from Migori County, whilst others lived in Homa Bay County. There were nineteen male participants and twelve female participants. Four of those participants were youth farmers whose ages ranged from twenty-two to twenty-seven years. The participants were smallholder farmers both domestic and commercial. Additionally, the participants either had hired or casual labor or their family members helped them. Four out of the thirty-one farmers expressed that they worked alone with casual labor.

### Migori County

A majority of the participants lived in sub counties located in Migori County. Migori County has a population of 35,240 ("Population of cities in Kenya", 2021). The climate in Migori County is tropical with a lesser amount of rainfall in the summer than the winter. The average temperature in Migori County is 69.7 degrees ("Migori climate: Average temperature, weather by month, Migori weather averages,"). The respondents were sampled from Suna East and Awendo Sub Counties. two sub counties I interviewed in were Suna East and Awendo County.

### Homa Bay County

Other farmer participants were residents of Homa Bay County. Homa Bay County is located in near Lake Victoria. According to CGSpace, the main food crops are maize, beans, sorghum, millet, kales, sweet potatoes and, peas (International Center for Tropical Agriculture, 2016).

### Apparatus and Materials/ Procedure

In order to conduct interviews, computers were used to communicate with the participants. The Zoom software provided us with a platform to interview with other interns at the same time. Additionally, a questionnaire that consisted of four main objectives and the following questions were used to ask the participants. We were able to print our survey at home and ask questions based on that. The participants were able to hear the questions and with the help of Dr. Ouma, she translated their responses. I was able to interview four or five participants at a time. Focus group interviews were also conducted to add more clarity to the results (for triangulation). I was able to take five questions from my original questionnaire that I needed clarification on.



## **Results**

### Perception of Agriculture

It was essentially important to record their initial perceptions of Agriculture and if they have changed. Perceptions about agriculture can influence how you work on a daily basis. Based on the interviews 96.8% or 31 out of 32 participants initially viewed agriculture positively. The positive responses mostly stemmed from their childhood experiences. Other factors included positive experiences over time such as good yields and good agronomic practices. On the other have the other 3.2% viewed it negatively in the beginning.

### Focus Group

After interviewing in two different focus groups, the negative responses became clearer to understand. Many of the negative responses stemmed from the perceptions that farming was difficult and dirty. One respondent mentioned that they thought that farming was meant for the poor.

### Female Farmers

After interviewing twelve female farmers, seven (58.3%) of the female farmers mentioned labor as an obstacle they are facing. Many of the similarities stemmed from the amount of work they had to do themselves. Women struggle with labor because household costs matter more than labor cost. The other four female farmers had similar responses to the seven participants. They are having difficulties due to their time schedule and being the head of the house. One participant mentioned that they had difficulties getting fertilizers.

## Youth Farmers

Out of the four youth farmers, all of them view agriculture as a growing sector. Suggesting ways of improving agriculture was also essential to understanding how to attract more youth. One out of the four participants mentioned that there could be more industries and techniques used to help the youth. Another participant suggested to enforce the technology side of agriculture on youth. One youth mentioned that farming is not seen as profitable to a majority of the youth. Additionally, it was mentioned that youth fear the labor of farm work. In order to gain interest, they recommended to change the education curriculum in high schools. For example, to have a compulsory subject where you can see the economic benefits of farming. Additionally, this participant suggested that youth get involved in commercialization and mechanizations such as machine working. Additionally, another youth suggested to implement demonstration plots in the youth training. All of the participants mentioned that the government should be responsible for these changes. In order to get more youth participants, I would want to create and interview a second group that focuses on youth and their solutions.

## Knowledge and Planning of a Farm

The participants were asked several questions about the benefits of their business plans and what their plans are to expand their farm. Business plans are essential in operating and sustaining a business. It is especially important to maintain a business plan for farmers whose everyday conditions can change based on weather or biotic factors including insects for example. An example of a biotic factor in this circumstance is stem borers affecting crops. All of the participants interviewed expressed that they had a form of a business plan. Two of the overarching results were that it helps plan activities and helps distinguish the losses from the

gains. Additionally, ten of the participants mentioned that having a business plan helps with timely agronomy practices. This will then help the farmers prepare the land at the right time

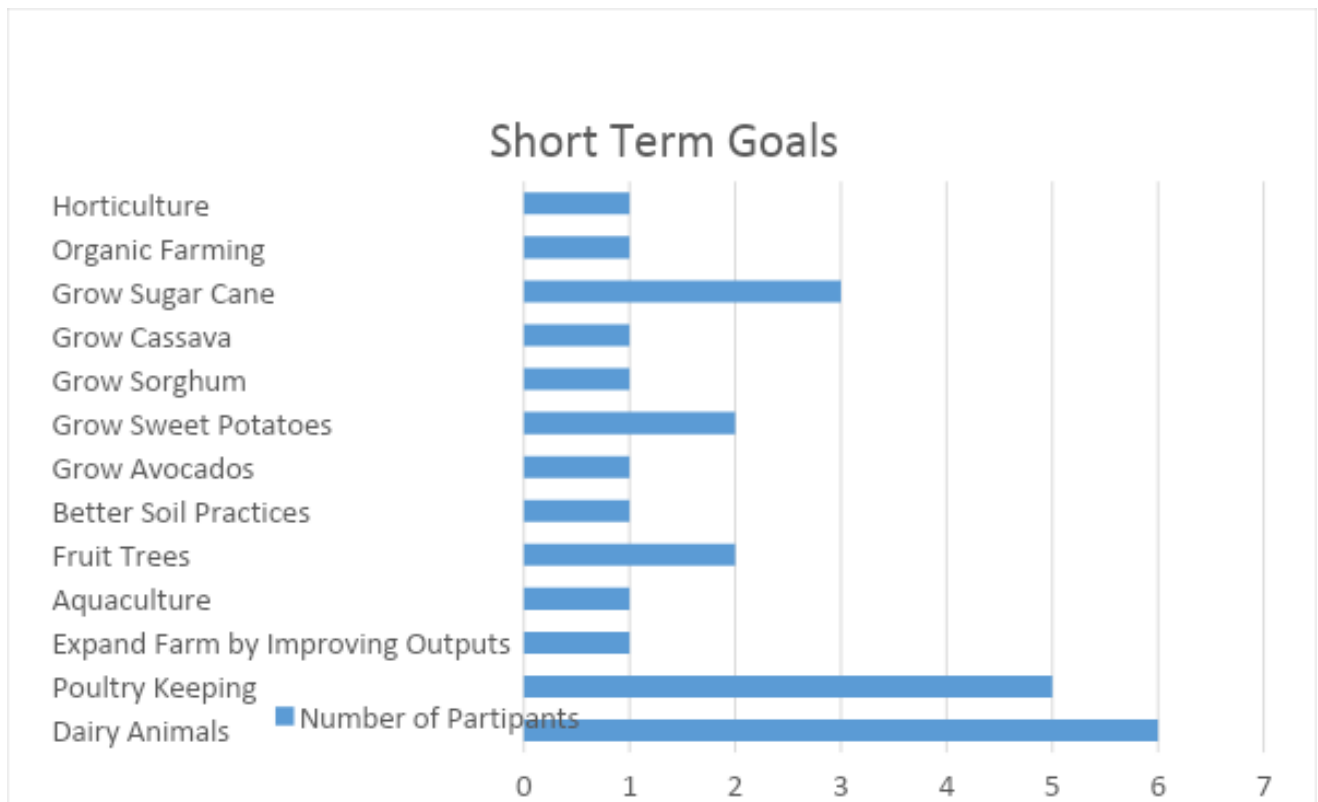


Figure 1. Short term goals determined by farmers.

while also knowing the profitability of each farm enterprise. Two responses from the short-term goals mentioned that they wanted to grow sweet potatoes (Figure 1). One of the respondents expressed that the orange-fleshed sweet potatoes can provide vitamin A (Figure 1). Vitamin A can help with the immune system which is especially needed during the current pandemic. Additionally, a participant mentioned that sorghum is proven to help control diabetes.

#### Farm-to-Market Experience in Western Kenya

One of the questions asked was to explain if you sell your produce or keep your produce. A majority of the farmers were push-pull farmers which means that maize is their staple crop. For example, one farmer keeps eight bags for the family and seven for selling to local markets. Those

local markets can include agrovets or local markets within a ten to thirty-minute radius from one another. Additionally, this particular farmer had help linking with Farm gate, an online input outlet. Also, another farmer in a larger household sells forty percent and consumes sixty percent of the maize harvest in a given season. Moreover, a youth farmer expressed that twenty percent of the income goes towards the parent in-laws. While eighty percent of their proceeds goes to the markets. Another farmer expressed that forty percent goes to the market because they fear the family will be food insecure. Sixty percent of the produce and the sales goes to the markets. Additionally, another family sells 8 from maize and consumes five of them sell eight and consumes five while they also sell two out of five and consume the rest.

The consumption of food depends on the size of the household. Those who do not end up selling, sell to the local markets for consumption. It was also mentioned that if particular produce looks bad, then it will not sell. However, if particular produce looks good and spotless, then it will sell well. Also, it was important to find out where the participants are purchasing their inputs from. The participants in Migori County and Homa Bay County expressed that they purchase their inputs from local markets or Agrovets. Agrovets are stockiest or suppliers for farm inputs such as fertilizers, fodder, seeds, pesticides, herbicides, and small farm equipment. Another participant expressed that the inputs went up from 2000 shillings to 3000 shillings (50%). Farmers were provided seeds from their government whilst some never received any financial support.



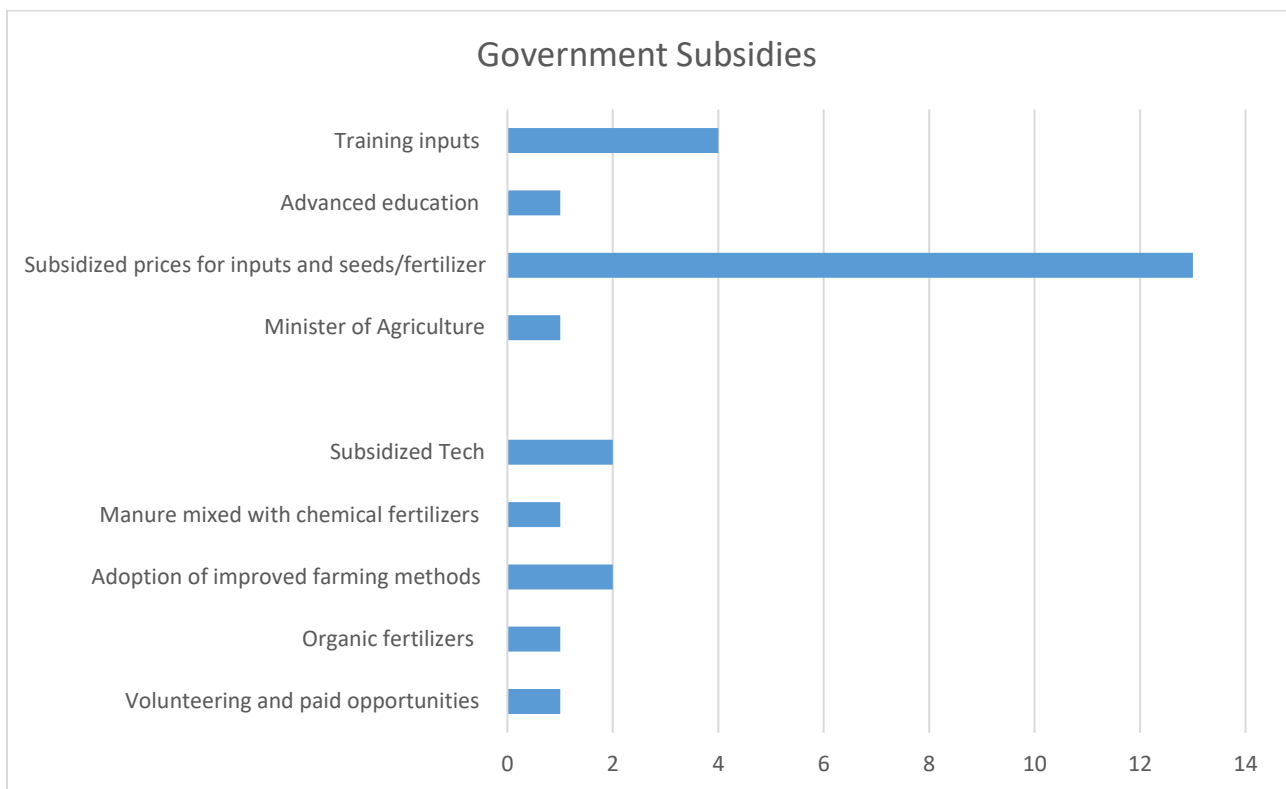
Figure 2. Long term goals determined by farmers.

### Agricultural Production

One of the most pertinent questions in this study is how farmers' productivity can be increased on their farms. Many of the participants mentioned that they need more training and inputs. Many have expressed the lack of inadequate farm equipment that was given. Additionally, two farmers mentioned that they are having a hard time finding proper irrigation systems for the crops. Furthermore, the participants also expressed the preparation of organic manure and composting need to be managed. Also, it was mentioned that the government should do a soil analysis so they'll know what crops suit which sites. Other responses included, the agricultural extension being intensified as well as being supported with capital for farm activities.

## Government Assistance

There was a fair mix of participants that received government assistance. Many of the governmental assistance ranged from subsidized prices for inputs like fertilizers and seeds (Figure 3). Additionally, there has been government assistance for inputs like fodder for the animals. I noticed that some who said they did not receive government assistance changed their answers after they were given time.



*Figure 3. Government subsidies farmers received.*

This chart shows that the majority of the farmers receive government assistance to fund inputs, fertilizers, and feed (Figure 3). Additionally, the second highest is training support from ICIPE. ICIPE provides training for the push-pull plots (Figure 3).

## Discussion

The main specific objectives of my study include:

1. To analyze if the perceptions of the agribusiness sector have changed since the start of their farming career.
2. To analyze how knowledge and planning of a farm has impacted smallholder farmers in western Kenya
3. To evaluate the farm-to-market experience for farmers in western Kenyan. (How are they different for women and youth?)
4. To assess the need for local agricultural programs that help educate farmers about the agribusiness sector

Incorporating these objectives into the study helped determine what the different aspects of agricultural production are. These objectives were also set out to see what the farmers are doing and what the government can help with. Although there has been government support, as illustrated in Figure 3, there can still be improvements. Many of the farmers provided their plans on how to improve productivity on their farm. Many of the subsidized inputs and trainings were conducted by the government. However, in terms of personal expansion to their farm, the farmers wanted more support from the government. This support entails provided more inputs, trainings, and education for the farmers. One farmer mentioned that trainings are typically done in one language. Furthermore, she expressed that it would be beneficial to teach in more than one language depending on the area. Agricultural production in Western Kenya is one of the driving forces for income and food for many families. During this research, it became evident that the production aspect was complex and ever changing.

It became clear that farmers with a business plan were confident about their plans. Business plans helped the farmers easily develop their short and long term goals. In addition to that, it was pertinent to do a questionnaire pertaining to the women and youth farmers in western Kenya.

Youth farmers are essentially important to continue the legacy of agriculture. Many of the youth farmers interviewed expressed that their peers are not interested in farming due to the perception.

A farmer suggested incorporating demonstration plots in lessons about agriculture.

Consequently, many of the youth will know about the different fields of agriculture.

In terms of future studies, there needs to be a focus on the different programs helping women and widowed women. In the study, there were two widowed women that were suffering due to the absence of their partner. It is important to investigate how this impacts their farms and if there are programs made to help. Additionally, there can be a greater focus on the youth programs in agriculture. By incorporating demonstration plots, for example, there could be a greater understanding and turnout with youth farmers. Overall, it has become clear the agriculture is essential in the livelihood of many. The farmers in western Kenya are resilient and hopeful for the future of agriculture.



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# Appendices

**Title: An Investigation of Agricultural Production and its Impact on Farmers in western Kenya.**

## General Questions

- Name? Gender? Age? Location?
- Marital status? Family Size?
- Level of education? College - Major?
- Farm size? Crops? Livestock?
- How Long Have You Been farming? Who helps on the farm?
- What is your main occupation?

## Objectives

- 1. To analyze the changing perceptions of western Kenyan farmers toward the agribusiness sector.**

### General

1. What was your perception of farming before you started?
2. Has your perception changed over the years? If so, how?

### Women

1. What challenges do women face in farming?
1. How can such challenges be overcome?

### Youth

1. Do you view agriculture as a growing sector? Why or why not?
1. Suggest ways of improving agriculture to be more appealing to the youth?
1. Who do you think should be responsible for making such changes?

- 2. To analyze how planning has impacted smallholder farmers business in western Kenyan**

### Planning

1. Do you have a Farm business plan? If not, have you considered making one?
2. How has your farm benefitted from a business plan?
- 3. What are some of your short term goals? (1-3 years)**
- 4. What are some of your long-term goals? (More than 3 years)**
5. Do you have plans to expand or diversify your farm? Ex: poultry, dairy, horticulture.  
How will you achieve this?  
Ex: Ease of organizing and implementing farm activities (production up to selling)
  - a. Ease of calculating profitability of farm enterprise(s)

- 3. To assess the differences between a subsistence farmer and a commercial farmer**

### Subsistence Farming

1. Where do you buy your inputs (seed/feed/fertilizer/pesticides, etc) from?

2. How much of your produce goes towards your families?
3. Is transportation between your farm and markets more or less than 10 minutes away?

### **Commercial Farming**

#### Buying

. How much do the seeds/feed cost? (Fill the table provided)

Seeds (Unit Quantity)	Cost per unit	Feed (Unit quantity)	Cost per unit
Maize seed		Chick mash	
Sorghum) (2 Kg)		Growers' mash	
Beans (_____)		Layers mash	
Rice (_____)		Dairy meal	

#### Selling

Where/Who do you sell your food to?

4. How much of your produce goes to the markets?

1. Do you utilize any forms of technology to sell your crops? (Technology such as Twiga Farms or AgUnity apps, Kenya Agricultural commodity exchange -KACE)

#### **4. To assess the need for local agricultural programs that help educate farmers about the agribusiness sector.**

1. Are there any programs that your government has implemented for farmers that have helped you this far?
  - If yes, outline some of the programs
1. What could be improved to help increase productivity on your farm?

#### **Focus Group Questions**

1. What was your perception of farming before you started and has it changed?
2. Do you have a business plan for your farm and how has it benefited your farm?
3. What plans do you have to expand or diversify your farm?
4. Are there any programs that your government has implemented for farmers that have helped you this far?
5. What are some factors that could be improved to help increase your agricultural productivity?