

Research Topic:

THE IMPACT OF CLIMATE CHANGE ON RICE PRODUCTION IN KORTU TOWN FENDALL COMMUNITY

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Abstract

According to the Ministry of Agriculture Comprehensive Assessment of the Agriculture Sector in Liberia (CAAS, 2007), there are some evidence to suggest that rainfall patterns are changing in Liberia and perhaps diminishing, because of the removal of large areas of vegetation due to shifting cultivation. Which is also practice in Kortu Town Fendall community. Based on this publications, the researcher decided to investigate the Impact of Climate Change on rice production in Kortu Town Fendall Community, with the used of self-prepared open questionnaires, the research cover both males and females rice farmers in Kortu Town between the ages of 18 to 45 years from October 10, 2018 to November 30, 2018. The total population of rice farmers in Kortu Town Fendall is less than 100, therefore the researcher sample the entire population of 11 (eleven) persons out of which only nine (9) participated. Seven (7) females and two (2) males. Based on the responses from the participants it was observed and concluded that climate change has negative impact on rice production especially excess rain which the participants said causes their rice crop roots to get rotten, and burn during longer period of sun shine leaving the crop to have empty caryopsis (seeds). All the participants consented to better productivity and higher yield before they started experiencing the impact of climate change. Five participants said they do not have an irrigation plan apart from the rain, while the remaining four said during dry spheres, they rent water pump machine for irrigation. Six out of nine participants furiously claimed they purchase their own seeds for production.

Against these backgrounds, I recommend that additional research be done at Kortu Town Fendall community to establish workable adaptation and mitigation plans on climate change impacts on rice production. I also want to use this medium to recommend to Government, Governmental Organization (NGO) and humanitarian organizations that farmers in Kortu Town needs subsidies. I see a day that Liberia will export processed rice to the international world

Chapter: One

Introduction

Background

Liberia has a tropical climate which is characterized by raining, dry and Hamitan seasons. The raining season starts may and ends October with a rainfall of 2,372mm per annum, while the dry season starts in November and ends March. Hamitan starts mid-December to mid-February and does not affect agriculture, but is characterize by northern trade wind, and cool dry weather Fahnbulleh and Swinteh 2015.

According to Ministry of Agriculture Comprehensive Assessment of the Agriculture Sector in Liberia (CAAS 2007), there are some evidence to suggest that rainfall patterns are changing in Liberia, and perhaps diminishing because of the removal of large areas of vegetation due to the farming practice of shifting cultivation.

Climate Change according to the Food and Agriculture Organization (FAO, 2017) undermines food security, nutrition, poverty reduction and sustainability in many contexts. Subsistence agriculture is practice in Kortu Town, providing cassava, sugar cane, coco-nut, okra, and paper to the students at the University of Liberia Fendell Campus, and local road side markets for purchase and consumption. Based on these publications, and the thought of why farmers in Kortu Town, Fendall Community prefer to grow other crops like Zea mays (Corn), Manihot esculenta(cassava), and Saccharum officinarum (sugarcane) rather than our country's staple rice has claim the attention of the researcher.

Statement of Problem

The agricultural calendar of crops has been affected here in Kortu town Fendell Community, due to gradual climatic change impact. Changes in the climate have been a limiting factor on rice crops production throughout the year. Due to this impact, Farmers in Fendell community are more concerned with the production of other food crops like; *Zea mays* (Corn), *Manihot esculenta* (cassava), and *Saccharum officinarum* (sugarcane) rather than the country's staple *Oryza sativa* (rice) The few farmers that are engaged in agricultural productivities has less interest in the production of *Oryza sativa* (rice), which has claimed the attention of the researcher.

Significance of the Study

This study aims at helping farmers understand the different climatic changes, and their impacts on rice production to enable them maximize production.

To provide rice farmers in Kortu Town, Fendall community with adequate empirical facts, and solutions on how to mitigate climate change impacts on rice production.

To provide analytical facts about the changes in cropping seasons to Government, NGO's and other humanitarian organizations that aid farmers in providing farm inputs especially SEEDS for rice crop production in the Kortu Town community area.

Objective

To determine the impact of climate change on rice production in Kortu Town Fendall community, with the used of open questionnaires in two months.

Research Questions

Base on the significances of this study, the researcher decided to use a self-prepared open questionnaire to asked the participants the following primary questions;

What is their knowledge about climate change?

How has climatic conditions change over time?

What was situation of rice production before climate change?

What has been the impact of climate change on rice production?

Source of irrigation during longer dry season?

What is the source of rice seeds supplied?

Limitations

I had difficulties in identifying the ages of four (4) female rice farmers out of the total Seven (7) females that participated. They claimed that their parents did not tell them their ages.

I was also unable to meet all of my targeted rice farmers. Few of them left for their farms earlier before I got to their Town.

Delimitation

The research participants and scope include; males and females rice farmers within Kortu Town Fendall community from the ages of 18 to 45 years old, from October 10, 2018 to November 30, 2018, with the use of opened ended questionnaires.

Chapter Two

Literature Review

Subtopic: The different climatic seasons of Liberia and their impact on rice production.

Fahnbulleh and Swinteh 2015 identifies three seasons in Liberia, but stated that only two seasons actually affects agricultural productivity. The raining season from mid-April to mid-October, and dry season from mid-October to mid-April. The Hamitan season which runs from mid-December to mid-February and is characterize by heavy dew fall and saw wind. They also stated that up land rice are planted from November to August, while low land rice is planted from May to November. Here in Liberia, lowland rice grows best in swamps during the dry season as stated, while upland rice grows well during the raining season on well drained moist and level soils.

Subtopic: The Impact of increase solar radiation on rice production.

Ariff and Ramsden2016 analyzed the effect of climate change on rice production and concluded that, at increase solar temperature of 2°C, yield of rice will decrease from 5 MT per hectare to 4 MT per hectare. They said it is mainly caused by increase temperature during flowering and grain filling periods respectively.

Chapter: Three

Research Method

Base on the significance of the research, the researcher decided to adopt the use of qualitative random sampling in which the population will be specifically rice farmers both male and female between the ages of 18 to 45 years within Fendall community.

The researcher aim at using self-prepared open questionnaire so that the participants can have chance to explain, which could be used to prove or disprove the hypothesis.

Data will be analyzed with the use of statistical tools which include; tables, graphs and photographs

Chapter: Four

Findings

Table 1, Participant's response to what is their knowledge about climate change?

Participants	Sex	Responses
A	Male	Yes, these days there are more rain and less sun.
B	Female	Yes, the climate can fool us with the planting season.
C	Male	No, I do not know anything about climate change.
D	Female	Yes, the climate has change here.
E	Female	Yes, I have experience change in the raining season, and it can really confuse me about when to start planting.
F	Female	Yes, I know about climate and it is affecting our agriculture here.
G	Female	Yes, these days the climate is confusing me.
H	Female	Yes, I know about climate change.
I	Female	I know about it (climate change).

Table 2, Participant’s response to, how has climatic conditions change over time?

Participants	Sex	Responses
A	Male	Like I said, these days we experience more rain and less sun.
B	Female	Yes, the climate has change, and it can confuse us here.
C	Male	No
D	Female	Nowadays the rain don’t want to stop. Even now around this 27 of November it never use to be raining like it is now. This is affecting our agricultural calendar.
E	Female	These day we have more rain than it supposed to be.
F	Female	We used to plant anytime, but now the weather is different things has change.
G	Female	The time we can be expecting rain, sun can still be shining.
H	Female	The dry season can still long, when you expecting rain sun can still be shinning.
I	Female	Like this year, the rain is too much, but surprisingly we did not noticed the seven day rain.

Table 3, Participant's response to, what was the situation of rice production before climate change?

Participants	Sex	Responses
A	Male	Germination was well and fast, when we plant may at that time rain can be falling, so our crops used to germinate and produced well.
B	Female	Our rice production here was very fine, it was good.
C	Male	For me things have okay, just start on time.
D	Female	Production was good, we got yield that was expected!
E	Female	Before, long age rice production here was very good, no worries at that time.
F	Female	Long ago, rice production here was far better than what it is now here.
G	Female	The rice used to come up good.
H	Female	Rice production was better here long ago.
I	Female	Yield was good, before our rice used to have high yield. But now things have changed.

Table 4, Participant's response, what has been the impact of climate change on rice production?

Participants	Sex	Responses
A	Male	When we experience long raining season, especially in the swamp it makes our rice empty and you know rice need both sun and rain for good production, and the rice will not be full in the shell when the raining season is short than what is supposed to be.
B	Female	Longer raining season can harm our rice, no harm to swamp land rice because we can open the swamp only upland rice it can really harm. We experience more problem from climate change on the upland.
C	Male	To me, climate change especially long rain have no effect on rice, weather it is short or long just plant on time in march.
D	Female	During the shorter raining season, the soil under the rice gets dry, and rice crop needs more water, when using the swamp in case of long dry the impact will be less, because the swamp takes time to get dry, before the plant starts to suffer from drought.
E	Female	Too much/excess rain can spoil the crop by damaging the roots.
F	Female	During longer raining season the rice can die, because the roots gets rotten. due to plenty water.
G	Female	Longer dry season can make the rice not to come up good
H	Female	What I know is that, too much rain can spoil the rice roots.
I	Female	When the water overcome the rice, it can spoiled the rice. At the same time when there is too much sun, the rice can burn.

Table 5, Participant's response to, Source of irrigation during longer dry season?

Participants	Sex	Responses
A	Male	I don't irrigate, all I do is that, I wait for the rain and use the rain to water my crops.
B	Female	I can rent water pump machine to water my crops when I am experiencing mush dry season on the upland.
C	Male	I start my Upland rice farming in March, so I can just wait for the rain, I don't have any means of watering apart from using the rain.
D	Female	I can use water machine when too much sun is shining to water my rice crop.
E	Female	I depend on the rain, and so I try to do early planting
F	Female	When there is too much sun I rent machine to water my crops.
G	Female	I can used water machine when the sun is too much.
H	Female	I can depend on the rain for water.
I	Female	I do not irrigate by myself, I depend on the rain to water the rice.

Table 6, Participant’s response to, what is the source of rice seeds supplied?

Participants	Sex	Responses
A	Male	I buy my own seeds.
B	Female	I can buy it for myself, I mean the seeds.
C	Male	I can buy my own seeds, but the birds can disturb the rice.
D	Female	I can purchase it myself.
E	Female	Myself can buy my seeds for planting
F	Female	I can sometimes buy it myself, or ask a friend through trade so that at harvest I can give few bunches for the seeds I got for planting.
G	Female	Family members can help me with rice seeds.
H	Female	Non-Governmental Organization (NGO)
I	Female	We joined coupe, and my friends can help me seeds (coupe this is a system where farmers join forces to help each other with agricultural activities.) which also include seeds for planting.

Chapter: Five

Discussions

Table 1

Presenting responses of participants in answer to their knowledge about climate change.

Three (3) males, and seven (7) females participated in the research summing the total participants to nine (9). Out of which eight consented to the knowledge of climate with only participant C claiming not to have any knowledge about climate change.

Table 2

Presenting responses of participants in answer to their knowledge about climate change.

Shows the responses of participants to primary research question, how has climatic condition change shows that eight (8) out of nine (9) participants stated ways in which they have experience climate change with participant A, D, E, and I clearly stating that they experience more rain than sun with participant B claiming that she gets confuse over the way climate have change while participant G noted that the excess rain is affecting their agriculture calendar.

Table 3

Shows participants response to what was the situation of rice production before climate change

Participant A said germination was well and fast his crops did produce well before he started to experience changes in the climate.

The remaining participants consented that germination, production, and yield was very good before they started to experience changes in the climate like all other participants, participant I who is a female said that yield was good. Before, our rice used to have high yield, but nowadays yield output have change.

Table 4

Eight (8) participant out of nine (9) consented to climate change impact on rice production. In particular, participant A said when experiencing long raining season, especially in the swamp, the rice crop panicle becomes empty and if the raining season is too short the rice seed (caryopsis) will not be full. He further stated that the rice needs both rain and sun like and other plant to grow well. According to participant D, during short raining season the rice can get dry, he also said, when using the swamp in case of long dry season, the impact can normally be less, because the swamp takes longer time to dry before the rice crop starts to suffer from drought.

Participant F said longer raining season or excess water can cause the roots of the crops to get rotten which eventually leads to the plant death.

Participant E consented with Participant F, she too much rain can spoil the rice crop by damaging the roots. Participant I explained that when water overcome the rice, it spoil the rice and at the same time when there is too much sun, the rice crop can get burn due to lack of water.

Table 5

Out of the nine (9) participants, five (5) in persons of participant A, C, E, H, and I said they do not depend on the rain for irrigations so without the rain it is difficult to plant. While the remaining participants in persons of B, D, F, G said they used rented water pump machine for irrigation when experiencing drought, but they complained that the machine us is expensive.

Table 6

This table show that participant A, D, C, D, E, F purchase their own seeds for production, while participant I said she joint coupe with friends where she can borrow rice seeds for production and participant G said her family member can dry portion of their harvested rice to be used as seed for the next production period from which she gets her rice seeds for production.

Participant H claim to be the only rice farmer at Kortu Town who have received seeds a Non-Governmental Organization (NGO) whose name she cannot remember.

Chapter: 6

Conclusion

Base on the information obtained from the used of self-prepared open questionnaire, eight (8) participants out of nine (9) consented to the knowledge of climate change and the existence of the **negative impact climate change has on rice production in Kortu Town Fendall** Community.

They claimed that rice production in early years was good, and with high yield output at harvest, which have change over the years leaving the majority of them confused about the appropriate time to engage the soil for rice productivity.

In times of dry sphere, participating farmers in majority said they normally rent water pump machine which they claim is too expensive in cost analysis of production.

Participants also furiously said, they purchase their own seeds in majority and engage in some other agricultural activities by helping other which include laboring for family and friends for seeds through what they call coupe in their local tongue.

Chapter: 7

Recommendation

Base on the findings, I recommends that additional research be done at Kortu Town Fendall community to establish workable adaptation and mitigation plans on climate change impacts.

I also want to use this medium to recommend to Government,

Non- Governmental Organization (NGO) and humanitarian organizations that farmers in Kortu Town needs subsidies in farming inputs like (seeds, irrigation cans, agrochemicals, cutlasses, hoes, shovels and rain -booths) to improve rice production activities in the community while, looking forward to bigger intervention of agro-mechanization in the community.

References

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rice production in Malaysia

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