

The Coping Mechanisms Utilized by Smallholder Crop Farmers to Cope with the Effects of Climate Change and Mental Illnesses in Embu and Meru Counties of Kenya

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Abstract

The purpose of this study was to investigate the coping mechanisms utilized by smallholder crop farmers to cope with the effects of climate change and mental illnesses in Embu and Meru counties of Kenya. A sample of 400 smallholder crop farmers was selected using quota sampling. A researcher formulated questionnaire was utilized for data collection. The study indicates that climate changes in both Embu and Meru have not been conducive to the smallholder crop farmers in these regions. Climate changes according to the study results have had negative effect on the agricultural activities of smallholder crop farmers in Embu and Meru as well as on their mental health. This study recommends that smallholder farmers should engage in psychotherapy or seminars that train them on effective adaptive coping mechanisms to help them in dealing with the effects of climate change on one hand and mental illnesses on the other.

Keywords: Climate Change, Mental Illness, Mental Health, Agricultural Activity, Coping Mechanism, Smallholder Farmer, Psychological Wellbeing, Kenya.

1. Introduction

Farmers are greatly affected by climate change due to the fact that agriculture is highly vulnerable to effects of climate change because it depends mostly on weather parameters for its success (Malhi et. al., 2021). Changes in climate according to Malhietal. (2021) in a study done in Indonesia lead to farmers having to grapple with reduced crop yields which causes food insecurity, reduced revenue, increased costs as farmers deal with increased insecticides due to climate changes. According to this study done in Indonesia, climate changes also cause strained relationships as farmers deal with the stresses caused by climate change. Lewis et al. (2018) in a study done in the USA cite that smallholder farmers will be the most affected by climate changes due to their dependence on climate and natural resources, they do not have sufficient resources to do irrigation, buy drought resistant crops or get insurances that protect them from the impact of climate change.

Ramadas and Kuttichira (2017) cite that farmers invest their resources such as money and time into the crop they plant. Their hope is that at the end of the season, they will get a bountiful harvest that

they consume, sell to get income or for both purposes. Crop failure becomes a psychosocial stressor to these farmers as they deal with the loss of crop due to the failure, the loss of the money invested in the farming processes as well as deal with crashed expectations of a good harvest. According to WHO (2018), migration due to occurrences such as climate change is a complex and stressful event, the refugees or migrants can suffer from mental illnesses such as anxiety, post-traumatic stress and depressive disorders if they are unable to adaptively cope with the stress associated with the changes. In fact, while there are many determinants to poor mental health that lead to various mental illnesses, climate change and its associative factors have shown strong correlations to mental health issues (Henderson et al., 2018).

According to Hayes and Poland (2018), mental health has been overlooked in the understanding and dealing with the impact of climate change. This oversight has been due to the general lack of attention to mental health across the world as well as due to issues of difficulties in assessing, predicting and monitoring mental health challenges caused by climate changes. Also, Induced stress due to climate changes causes anxiety, depression, trauma, aggression, antisocial behavior, dissociation, substance use and negatively affects the psychological well-being of individuals (Clayton et al., 2017). An APA survey that was released in February 2020 show that 56% of adults in the U.S cite climate change as the most important issue currently facing the world leading to 'eco-anxiety', 'eco-depression' and 'eco-trauma' (APA, 2021).

According to Howard et al. (2020), farmers have been using coping mechanisms such as adopting strategic farming techniques and resilience to cope with the effects of climate change and mental illness. Yazd et al. (2019) state that agricultural activities stress is common across board with farmers in both developed and developing countries and may lead to mental illnesses if not appropriately addressed hence making climate change a global concern. The Kenya National Adaptation Plan (2016) states that the Kenyan government has been negatively impacted by climate change and threatens the realization of the vision 2030 goals. This is an indication that Kenya needs to engage in investigation of the effects of climate change on the mental health of farmers whose livelihood is dependent on agricultural activities.

According to Ministry of Foreign Affairs (2018), Kenya is highly vulnerable to climate change and hence, predisposed to the effects of climate change with the report ranking Kenya at 151 out of 181 countries for climate vulnerability. The current projections indicate that temperature in Kenya will rise by 0.25°C between 2000 and 2050 while at the same time rainfall will be less predictable and more intense. Adverse effects of climate change such as droughts will cause major threats to food security and water availability (Ministry of Foreign Affairs, 2018) thus causing mental health problems to farmers such as depression and anxiety. What remains significantly uninvestigated however is the effect of climate change on smallholder crop farmers agricultural activities and the coping mechanisms to deal with mental illness used in Embu and Meru Counties of Kenya.

2. Methods

The study was based on descriptive survey design. The study was done in Embu and Meru counties of Kenya. From both the Embu County and Meru County records of registered farmers, Embu has 677,876 farmers while Meru has 762,341 farmers (Embu County Records, 2021; Meru County Records, 2021). The county records show that 60% of these are smallholder farmers. This means

that for Embu, the approximate number of smallholder farmers are 406,725 while for Meru the number is 457,404 smallholder farmers which gives a target population of 864,129 farmers. A sample size of 400 smallholder farmers was determined using Yamane's formula. Quota sampling technique was used to select only 400 smallholder crop farmers for this study with 200 smallholder farmers being from Embu County and 200 smallholder farmers from Meru County.

The data collection process involved the use of a researcher formulated questionnaire to assess the effects of climate change on agricultural activities and the coping mechanisms that farmers are utilizing to cope with the effects of climate change and mental illnesses. Consequently, data was analyzed using descriptive statistical methods. The descriptive statistical tools included frequencies, percentages, means and standard deviation that helped describe the effects climate change has on agricultural activities and the coping mechanisms used. Permission was obtained from the psychology department and the Institutional Review Board (IRB) United States International University- Africa (USIU-A) as well as the National Commission for Science, Technology and Innovation (NACOSTI) for approval of this study. The smallholder crop farmers were provided with information needed for informed consent. This involved providing the participants with detailed information about the key elements of the study, what their participation involved, explaining the potential benefits and risks with the mitigation factors therein, the projected duration of the study, reimbursements if any or none as well as the rights of the participants during and after the study. The participants were also assured of confidentiality and that the information they shared during the research would be kept private and confidential. The farmers were informed of their right to withdraw from the research at any time if they felt uncomfortable with the process or if they felt that they would like to withdraw from the research for whatever reasons.

3. Results

3.1 Effects of Climate Change on Smallholder Crop Farmers Agricultural Activities

The study sought to establish the effects of climate change on smallholder crop farmers' agricultural activities. The result is evidenced by opinions from farmers presented in Likert scale and shown in Table 1

Table 1: Climate Change and Agricultural Activities

Statements	SA		A		U		D		SD	
	F	%	F	%	F	%	F	%	F	%
Climate change has been significant enough to affect our farming processes	323	80.8	72	18.0	4	1.0	0	0.0	1	0.3
The climate change determines the agricultural yields at my farm	236	59.0	158	39.5	3	0.8	0	0.0	3	0.8
The climate change determines the rainfall supply at my farm	279	69.8	111	27.8	9	2.3	0	0.0	1	0.3
Climate change has a wide coverage of effect on my farming	242	60.5	149	37.3	6	1.5	2	0.5	1	0.3
The climate change has reduced agricultural yields in the area where I farm	238	59.5	148	37.0	12	3.0	0	0.0	2	0.5
The climate changes have led to declining rainfall in the area where I farm	251	62.7	141	35.3	7	1.8	0	0.0	1	0.3
The climate change has increased heat levels in the area where I farm	256	64.0	126	31.5	14	3.5	2	0.5	2	0.5
The climate change has enhanced drought in the area where I farm	251	62.7	123	30.8	20	5.0	3	0.8	3	0.8

Based on the results from Table 1 it is clear that climate change has affected the farming processes of smallholder farmers in Meru and Embu (98.8%); the climate change determines the agricultural yields at the farm of smallholder farmers (98.5%); and the climate change determines the rainfall supply at the farm of smallholder farmers (97.6%). Further, climate change has a wide coverage of effect on smallholder farming (97.8%); climate change has reduced agricultural yields in the area where the smallholder farmers farm (96.5%); and climate changes have led to declining rainfall in the area where the smallholder farmers farm (98.0%). Finally, climate change has enhanced drought in the area where the smallholder farmers farm (93.5%). From the above finding, it is clear that climate changes have had a considerable negative effect on agricultural activities and outcomes engaged in by the smallholder farmers in Embu and Meru.

3.2 Coping Mechanisms to cope with effects of climate change and mental illness

The results on the coping mechanisms that smallholder crop farmers have been utilizing to cope with the effects of climate change and mental illness is seen in Table 2.

Table 2: Coping mechanisms

Statements	VGE		GE		NE		SE		VSE	
	F	%	F	%	F	%	F	%	F	%
I access cash loans to help me cope with climate changes	163	40.8	100	25.0	63	53.8	22	5.5	52	13.0
I access in-kind goods and services to help me cope with climate changes	46	11.5	105	26.3	35	8.8	21	5.3	193	48.3
I engage in structure-gift exchanges to help me cope with climate changes	49	12.3	81	20.3	59	14.8	95	23.8	116	29.0
I have migrated to another better area to help me cope with climate changes	66	16.5	73	18.3	52	13.0	49	12.3	160	40.0
We share food to help me cope with climate changes	60	15.0	83	20.8	57	14.2	105	26.3	95	23.8
I often choose to act opposite to what the emotion under stress tells me to do	213	53.3	131	32.8	20	5.0	13	3.3	23	5.8
I often engage in physical exercise and deep breathing exercises when stressed	190	47.5	149	37.3	23	5.8	16	4.0	22	5.5
I choose to see the positive side of any mental stressor	252	63.0	98	24.5	21	5.3	11	2.8	18	4.5
I often choose to control my emotions in a deliberate way and in a manner that seeks to not let the emotion get out of control	265	66.3	106	26.5	16	4.0	11	2.8	2	0.5

Table 2 presents the results on coping mechanisms to climate change and coping mechanisms to mental health issues. On coping mechanism to climate change majority of farmers to a very great extent accessed cash loans to help them cope with climate changes (65.8%). However, the smallholder farmers at a very small extent or just small extent accessed in-kind goods and services

to help them cope with climate changes (53.6%); engaged in structure-gift exchanges to help them cope with climate changes (52.8); migrated to another better area to help them cope with climate changes (52.3%); or shared food to help them cope with climate changes (50.1%).

However, on coping mechanisms to mental illness, majority to a great extent or a very great extent chose to act opposite to what the emotion under stress was telling them to do (86.1%); engaged in physical exercise and deep breathing exercises when stressed which included activities such as walking to the river, walking around their farms severally in a day for exercise and visiting their friends on foot (84.8%); chose to see the positive side of any mental stressor (87.5%); and finally chose often to control their emotions in a deliberate way and in a manner that sought to not let the emotion get out of control (92.8%). What is implied here is that the smallholder farmers in Embu and Meru were better coping with mental illness than they were at coping with climate change.

4. Discussion

Arora (2019) examined the effect of climate change on agricultural process, production and sustainable solutions by looking at the global perspective. The study notably finds that climate changes have occurred drastically in the last 100 years and these changes have considerably shifted the atmospheric pressure of the earth owing to the expansion of greenhouse emission from 0.9 °C to 1.5 °C by 2030. This has created a global earth that is highly unresponsive to agricultural production illustrated by the reduced production levels from the earth and the increased genetic production from greenhouses which come with dilapidated health quality outcomes.

However, the above study findings disagree with studies that have argued that attributing dwindling crop yields to greenhouse emissions of climate changes is without empirical and scientific finding that is based on reliable experimental findings. Poudel and Kotani (2013) in a study to examine crop yields using a crop simulation approach noted that climate changes as a result of greenhouse emissions had no significant effect on crop yields. However, this study did not highlight what was the predictor of dwindling crop yields despite admitting that those yields had been reducing over the years. Further, both studies have been done in developed countries where the energy emissions are higher than Kenya. There was thus need to examine the effect of climate change on the farmer and farming within the Kenyan context with its unique climate proclivities. From the results, it is clear that climate change that increases heat affects agricultural productivity based on the experience of smallholder farmers

Literature had noted that there are certain studies which have looked extensively at some of the coping strategies that farmers are using to cope with the debilitating effects of climate change. One such coping mechanism is the engagement with Agri-foods which use technology to counteract the challenges created by climate change and Agri-ecommerce. Zheng et al. (2017) did a study to examine Agri-foods as a coping mechanism used by farmers from China to respond to low rainfall patterns.

As far as coping mechanisms in dealing with mental illness, the results are aligned to reviewed literature considerably. Garland et al. (2011) in their western based study on coping strategies and its effect on mental constructs like anxiety, depression and burnout particularly examined the aspect of mindfulness which is considered a measure of coping strategies (Garland et al, 2011; Rees et al., 2015). In the study, mindfulness is described as the inclination covered within a person's trait that

enables them to experience and articulate non-judgmental stances and behavioral tendencies that underscore acting while aware as opposed to automatically in the face of adversity. The study thus notes that low mindfulness is characterized by persons acting inflexibly, reactively, unhindered and thoughtlessly when faced with certain emotionally charged situations. The study basically opines that those who are more unable to experience significant mindfulness experience detachment (low mindfulness) and also presented with higher anxiety levels thus less resilient. The extent to which this is true in the Kenyan setup in so far as coping strategies and its effects on mental health are concerned is not known and an investigation into it is thus necessary.

Further, the results agree with the study done among Tanzanian youth farmers (aged 12-24 years) done by Dow et al. (2018) to examine their level of coping strategies in dealing with anxiety and stress. The study examined coping strategies within three domains, self-care, mindfulness and self-efficacy and noted that mindfulness had the most significant effect on reducing stress and anxiety levels of the young people more than self-care and self-efficacy had. Further the study integrated coping strategic components with Cognitive Behavioral Therapy to help the young farmers identify and alter their negative thoughts, behaviour and feelings. This was also shown to have improved their status in the wake of disruptive climate shifts and reduced anxiety and stress levels among the young farmers.

5. Limitations

The main limitation of this study is the lack of multiple data triangulation that combines more than two research Instruments. Further, the findings may not necessarily be generalized to other counties in Kenya that do not fall within the Arid and Semi-Arid regions.

6. Conclusion

Climate changes have had a considerable negative effect on agricultural activities and outcomes engaged in by the smallholder crop farmers in Embu and Meru counties of Kenya. Literature discussed supports this conclusion that climate changes have had a considerable negative effect on agricultural activities and outcomes engaged in by smallholder farmers. The smallholder crop farmers in Embu and Meru are better coping with mental illness than they are coping with climate changes. In recommendations, for the smallholder crop farmers whose mental wellbeing has been affected by the effects of climate changes, they are encouraged to visit level 5 hospitals or county offices near them to benefit from psychotherapy or workshops that train them on effective coping mechanisms. This will help them to deal with climate change on one hand and mental illnesses on the other despite the challenges faced by these institutions such as limited human capital in provision of these services. Consequently, aspects like mindfulness, resilience, self-efficacy should be introduced to the smallholder farmers for consequent effective practice. Public and private partnerships to provide these smallholder farmers with mental healthcare services will also help them in coping with mental health challenges occasioned by the effects of climate change.

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