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**Empowering Women in Agriculture: Climate Adaptation
Strategies, Health Impact, and Citizen Science Approaches in
Kakamega County, Kenya**

Background of the Study

- Globally, climate change has emerged as one of the most pressing challenges, significantly affecting agriculture and food security
- Agriculture is both a contributor to and a victim of climate change, its responsible for nearly 17-18% of global greenhouse gases
- Sub-Saharan Africa, majority of the population depends directly or indirectly on agriculture.
- The sector faces declining productivity due to CC with women, who are key agricultural laborers, vulnerable to these impacts

Statement of the Problem

- Climate change severely impact agricultural productivity and food security, with Kenya facing significant challenges such as erratic rainfall, droughts, and extreme weather
- Women farmers are disproportionately affected by climate variability, and at the same time they have limited access to land, credit, technology, and climate-smart practices.
- These resource constraints exacerbate food insecurity and poverty among women farmers and limit their ability to adapt to climate change effectively.
- Climate change also poses health risks for women, including increased waterborne diseases, malnutrition, and mental health issues, which are exacerbated by agricultural challenges

Objectives

- To evaluate the health impact of climate change on women farmers in Kakamega County.
- To assess the effectiveness of climate adaptation strategies in improving agricultural productivity and resilience among women farmers .
- To explore the role of citizen science in empowering women farmers to contribute local knowledge and co-create climate adaptation strategies.

Materials and Methods

- **Study Area:** Kakamega County, focusing on three sub-counties Navakolo, Matungu, and Mumias.
- A mixed-methods approach was adopted
- **The target population:** women farmers, county government officials, agricultural officers, health officials, and community leaders
- Data collection involved questionnaires, 15 in-depth interviews with key informants, and six focus group discussions (FGDs) with women farmers.

Health Impact of Climate Change on Women

- Waterborne/Vector borne diseases
- Respiratory issues
- Changing weather patterns contribute to physical fatigue
- Mental health challenges like stress and anxiety from climate-related events due to their responsibilities in family and community care.
- Extreme weather events, such as floods, droughts, and heatwaves leads to increased health risk
- Malnutrition and Food Insecurity
- Pollution and exposure to contaminated water, can adversely affect maternal health, leading to complications during pregnancy, low birth weights, and other reproductive health issues.

FGD and Interview Responses

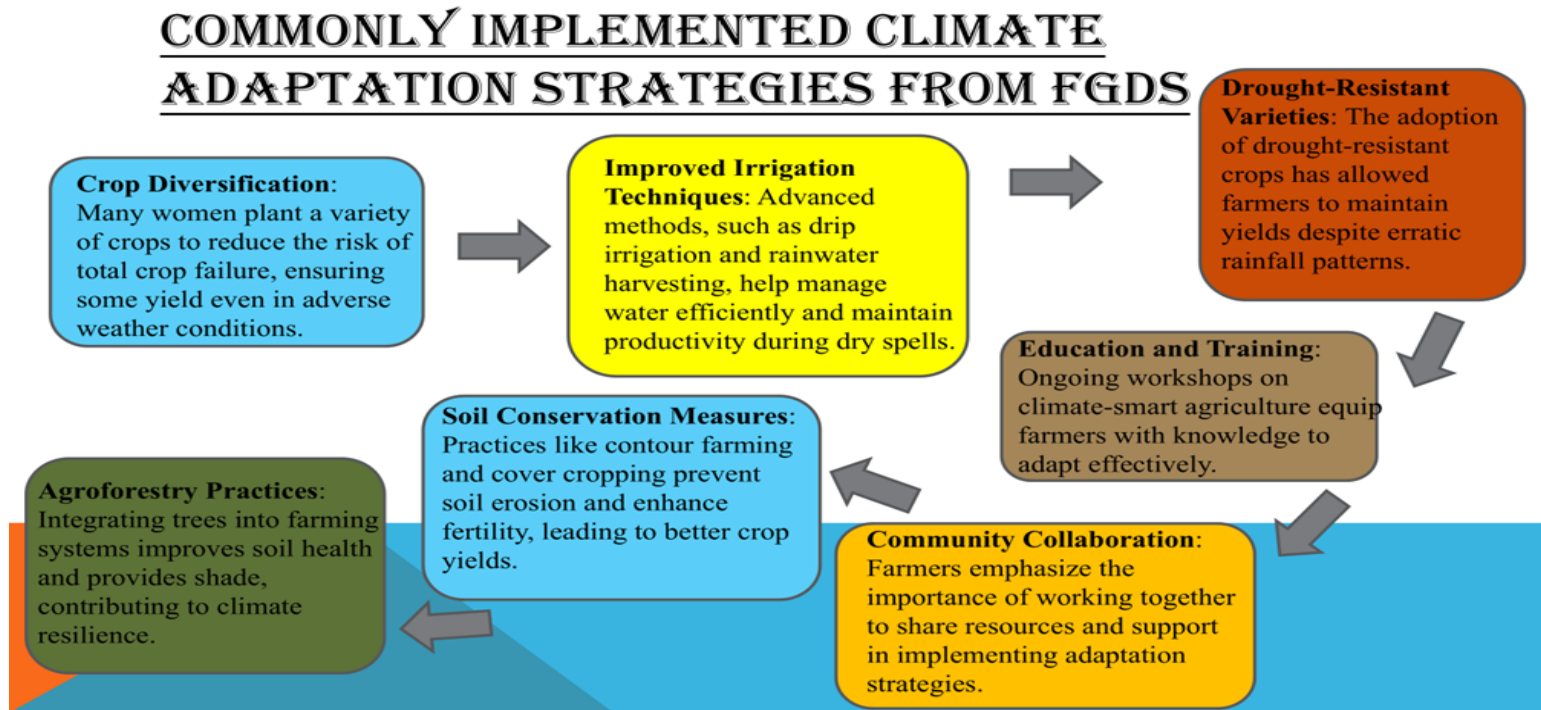
- FGD Participants expressed concern over the contamination of local water sources, particularly during heavy rains, leading to cholera outbreaks.
- Additionally, the increased dust and smoke from burning waste, as well as the use of harmful chemicals in farming, contribute to respiratory issues.
- Underscored the importance of community support and advocacy for resources to address these pressing health challenges.

“Changing weather patterns are significantly impacting the health and productivity of women farmers in our community. Many report experiencing physical fatigue due to increased farming intensity from unpredictable weather, while others face mental health challenges linked to stress and anxiety about climate variability. Additionally, some suffer from sleep disturbances caused by worries over crop failures and experience illnesses, such as headaches and gastrointestinal issues, related to stress. These combined effects diminish their productivity and well-being”

Climate Adaptation Strategies

- Diversification of crops and livestock
- use of drought-resistant crop varieties
- Soil and water conservation techniques (e.g., mulching, terracing, rainwater harvesting)
- Agroforestry practices
- Use of indigenous knowledge and seed saving
- Participating in farmer cooperatives and groups
- Engaging in crop rotation and intercropping
- Adoption of small-scale irrigation systems

Commonly implemented climate adaptation strategies from FGDs

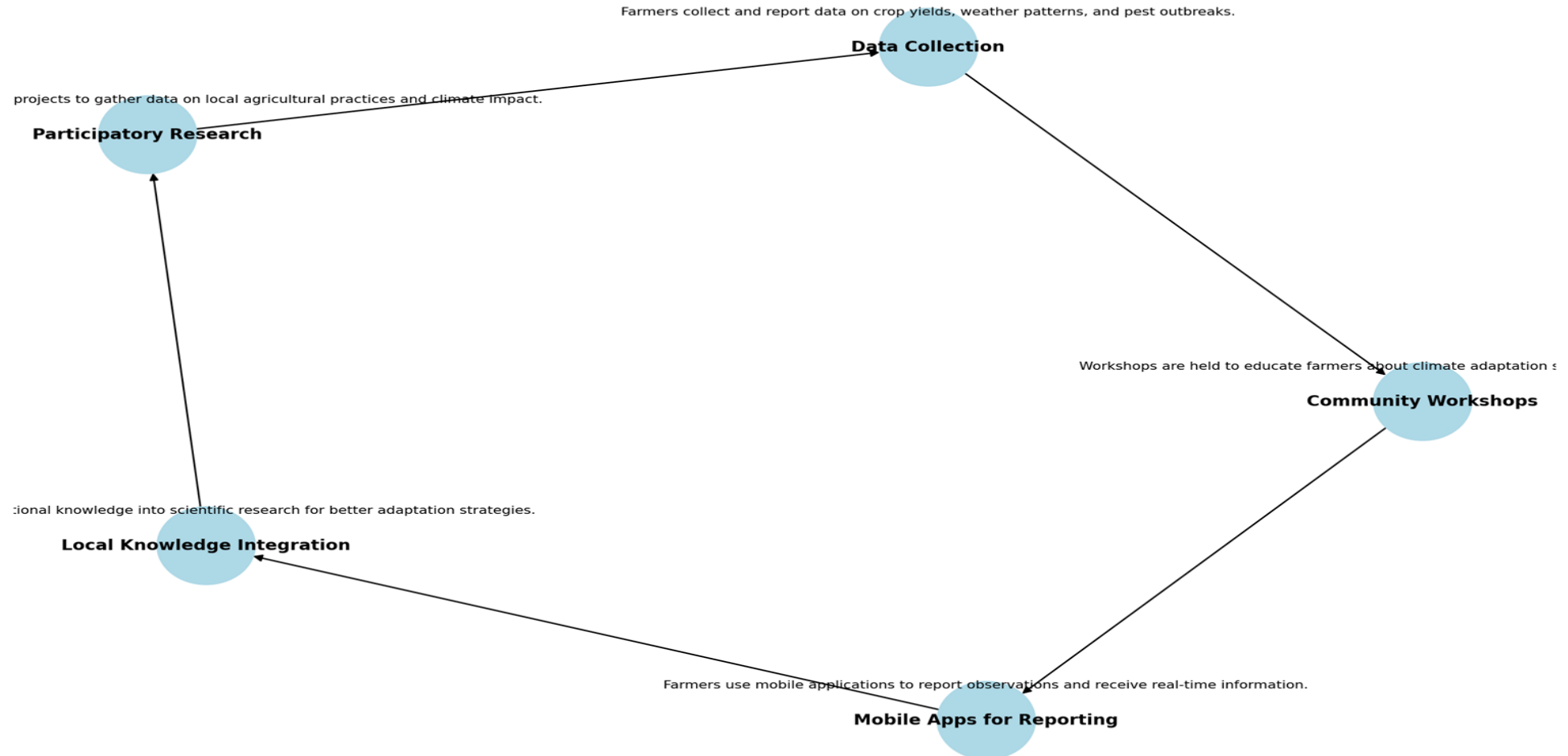


Empowering Women Farmers Through Citizen Science

- **Soil Health Testing and Mapping:** Supported by extension services or agricultural NGOs, such as One Acre Fund, which assist with soil testing and provide the necessary seeds based on test results.
- **Pest and Disease Monitoring:** Through community workshops, women farmers have learned to identify and report common pests and diseases via SMS systems, allowing quick communication with agricultural extension officers.
- **Participatory Crop Trials:** Women farmers have experimented with different climate-resilient crop varieties in collaboration with agricultural organizations and research institutions. The data collected has helped identify the best crops for the local climate.
- **Data Collection on Climate Impact:** With proper training, women farmers record observable climate impacts, such as changes in growing seasons, to track and adapt to climate shifts effectively.

Key informant responses indicating citizen science practices

Citizen Science Practices Empowering Women Farmers



Climate Change Testimonies



"Nowadays, due to excessive heat and strong sunlight, especially after 10 AM, we are compelled to wake up early to plough the land. As women, we must work hard because this is our main source of livelihood."

Adaptation to Climate Change



"During the rainy season, we harvest a lot of green vegetables like kunde. Since these vegetables cannot be stored for long, we have been forced to revert to our traditional practices. We prepare the vegetables by drying them in the sun, and once fully dried, we store them in a dry place for use during the dry seasons. This method enables us to enjoy our vegetables throughout the year."

Conclusion

- Climate change adversely affects the physical and mental health of women, emphasizing the need for targeted health interventions.
- Implemented strategies like crop diversification and improved irrigation have generally improved agricultural productivity, but challenges such as financial constraints limit their overall effectiveness.
- Women farmers encounter significant barriers, including lack of financial resources and insufficient training, which hinder the adoption of effective climate adaptation strategies.
- Climate adaptation strategies positively impact the economic stability of women farmers, but awareness and participation in citizen science initiatives remain low, indicating a need for enhanced outreach and education.

Recommendation

- Develop targeted health programs that address the specific health challenges faced by women farmers due to climate change, including awareness campaigns on preventive measures.
- Encourage the adoption of effective climate adaptation strategies, through training, extension services, and financial support.
- Foster collaboration between government agencies and NGOs to enhance support for women farmers, ensuring they are well-informed about available resources and assistance programs.
- Expand citizen science initiatives that enable women farmers to share their local knowledge, contributing to the co-creation of effective climate adaptation strategies and improving economic stability.