

DIGITAL ACCESSIBILITY, INCLUSION AND DIVERSITY

Digitization of Indigenous Agricultural Knowledge in Shaping Food Security across the Kenyan Coastal Region

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Abstract - According to Gilman (1917), food problem is related to three questions: First, "how to produce the most food with the least cost in time, labor and money," second, how to swiftly, efficiently and economically distribute it to consumers, and, third, how to prepare and serve healthy food, without spending too much money, time, and effort. Since then, considerable progress has been made in improving food supply and facilitating meal preparation. This paper looks at the importance of digitizing the indigenous farming methods that can be incorporated with the emerging trends in present agriculture playing a significant role in ensuring food security. This paper is submitted to iPRESS 2023 as a poster aimed at improving indigenous agricultural knowledge with a base for new capabilities in providing solutions matters food security. The paper addresses the conference topic: Digital accessibility, Inclusion, and Diversity.

I. INTRODUCTION

African Indigenous Foods Systems were clear and properly designed to ensure that households fed themselves. In the Kenya coastal region, many activities took place to ensure that families were food

secured and this include: Shifting cultivation on food crops, cash crops and horticulture crops; Intercropping involving annual (mostly food crops) and perennial crops (coconut and cashew nuts); Rain water harvesting to water crops; Farming activities like digging, planting, weeding and harvesting done by both men women and children (i.e. family); and preserving harvest for use before the next season using traditional methods like wooden barns (Were, 1988). Indigenous knowledge of preserving cereals, vegetables and meat were applied to ensure that there was enough food even during drought season. All these ensured food security at house level. With the current climate change issues and recent draught experienced in Kenya for the past six years, some indigenous methods of agriculture can play a crucial role in reversing the problems. This can only happen if the indigenous methods are digitized and shared with an aim of transforming food security.

Usually, farmers, either on their own or cooperatively in conjunction with other members of their neighborhoods, develop their respective knowledge base through time as a product of their

interaction with the environments in which they practice their livelihoods. Knowledge and skills are derived through a system of experimentation, spatial cognition and perceptions that lead to the selection of the most adaptive and useful practices. Successful adaptations and practices are preserved and passed on through generations mainly through oral tradition and on-farm practice.

A. *Indigenous Agricultural Knowledge*

It has become essential for scientists to comprehend traditional agriculture and the knowledge base that it offers due to the ongoing production issues facing crops and livestock, such as the regular crop failures brought on by drought, flooding, and insect infestations. It is clear that a complex farming system has improved traditional farmers' grasp of their surroundings, cropping and livestock movement networks, and helped them manage severe conditions to meet their subsistence needs without relying on contemporary agricultural technologies. The shortcomings that modern agriculture is currently experiencing might be fixed by comprehending these knowledge systems.

Indigenous agricultural knowledge include:

- 1) Well-established calendars for crops and livestock movement, productivity linkages between soil and drainage, climatic changes, and the function of natural plants and wildlife as environmental vitality indicators.
- 2) Farmers' knowledge of the environment profoundly influenced their decision-making about the site and timing of their produce.
- 3) Inter-cropping, which involves farmers having a thorough understanding of the types of plants, animals, insects, and birds that can or cannot coexist, as well as the functions of insects and other related arthropods as crop pests, disease-causing agents, food sources, and medicinal agents in their production systems. Inter-cropping increases production and guarantees food security.
- 4) Knowledge of environmental factors, including fauna and flora, leads to proper farming techniques in the face of floods, droughts, pests and diseases, and low soil fertility, which improves their ability to cope.
- 5) Traditional farmers mix a large number of species with structural variety throughout time and location (both through vertical and horizontal organization of

crops). Some crops act as supports or provide shade to others by being grown together.

6) Farmers take full advantage of the variety of micro-environments present in a field or region, which include those with varying soil, water, temperature, height, and slopes.

7) Crop-livestock alliances, in which livestock graze in vacant fields and leave manure behind, are another typical method used to preserve soil fertility and guarantee the availability of cropland throughout the growing season.

8) The traditional crops are high nutrition foods that are eaten at home or traded locally. Many of these crops along with numerous wild plants are also used medicinally. What might be considered a weed in some communities is often eaten as a salad by others. Every house hold lists several unique medical plants

B) *Digitization of Indigenous Agricultural Knowledge*

At the farm level and throughout the value chain, digitizing agricultural knowledge improves efficiency, productivity, and sustainability (Aubert et al., 2012; Wolfert et al., 2017). Agriculture information is being digitized in order to preserve it for future generations and to lessen the difficulties that farmers are having with contemporary agriculture. Digital platforms and applications have the power to fundamentally alter how information is processed, shared, accessed, preserved and used. Digital applications will enable hitherto impractical decision-making for farmers, potentially resulting in fundamental changes to farm management (Sonka, 2014; Wolfert et al., 2017).

The team has come up with a project of identifying this agricultural knowledge in the Kenyan coastal region and digitize it. The project is as a result of ideas that cropped up during the cooperative's education days and farm field visits where farmers shared their agricultural knowledge thus the need for digitization and preservation for easy sharing and retention. So far, the team has formed a farmers' cooperative (Pwani Ufanisi Farmers' Cooperative Society – PUFCS), that currently has slightly over six hundred farmers clustered depending on the crops that they farm and possess the crucial indigenous agricultural knowledge needed for digitization. A community of practice group has been formed via a

WhatsApp group whereby the farmers share knowledge freely. Physical farm visits are usually organized for physical knowledge transfer out of which some have been digitized. Several indigenous seeds including maize, sesame, cassava cuttings, and cashew nuts have been collected and are being reproduced by various farmers with the guidance and professional help from Kenya Plant Health Inspectorate Service (KEPHIS). PUFCO has started the process of producing documentaries on the various types of indigenous agricultural knowledge. The farmers are also trained on how to take videos of the various farming activities they are undertaking in their farms and how they are applying indigenous agricultural knowledge. The photos, videos and WhatsApp chats are exported into the PUFCO website (www.pwaniufanisi.co.ke) digital repository for preservation and where members can access, share and learn.

C. Conclusion

Digitization of indigenous agricultural knowledge and sharing the same to various stakeholders will play a crucial role in ensuring sustainable food production and supply in Kenya and other parts of Africa. Great knowledge will also be shared on various ways of improving traditional crops as sources of income thus eradicating poverty. Documenting, digitizing and preserving indigenous agricultural knowledge will also add value in understanding the nutritional value of respective crops, combating climate change issues, promoting health, education and promoting sustainable consumption and production. Foreseen challenges on this project will be expertise, funding and lack of equipment.

1. REFERENCES

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