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## The Impact of National Agricultural Rural Inclusive Growth Project (NARIGP) Value Chains on Sustainable Agricultural Adaptability in Makueni County, Kenya: A Critical Evaluation

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**Abstract:** This study critically evaluates the National Agricultural and Rural Inclusive Growth Project (NARIGP) in Makueni County, Kenya, focusing on its impact on sustainable agricultural practices and community adaptability. Using qualitative methods, the research gathered data from 50 participants, including Common Interest Groups (CIGs), Community-Driven Development Committees (CDDCs), and county officials through semi-structured interviews and two focus group discussions. The study examines NARIGP's interventions across four agricultural value chains: mango, green gram, tomato, and chicken, analyzing their impact on agricultural productivity, sustainable land management practices, and environmental conservation. Key findings highlight improvements in agricultural yields and community adaptability to climate-smart agriculture, while identifying challenges related to governance, market access, and inclusivity. Recommendations focus on improving governance, scaling sustainable practices, and enhancing inclusivity.

**Keywords:** NARIGP, Sustainable Development, Community-Driven Development, Agriculture, Kenya, Value Chains

### 1.1 Background of the study

Agriculture remains the cornerstone of economic development, food security, and rural livelihoods globally, yet it also faces mounting challenges from climate change, resource degradation, and socio-political factors. The African Union's Agenda 2063 emphasizes sustainable and inclusive development as a cornerstone of Africa's long-term vision (Tikly, 2019). Agenda 2063 aligns with global SDGs and seeks to enhance economic self-reliance, environmental conservation, and food security across the continent. In this context, sustainable agriculture plays a vital role in addressing food insecurity and

promoting environmental resilience. Studies by Njoroge et al. (2022) highlight that, African countries, including Kenya, Ethiopia, and Ghana, have adopted climate-smart agriculture (CSA) and sustainable agricultural intensification (SAI) policies to address these challenges. However, the success of these initiatives depends on community participation, effective governance, and capacity-building efforts (Kinyua et al., 2022).

In sub-Saharan Africa, agriculture supports over 60% of the population, yet the sector struggles with low productivity, land degradation, and vulnerability to climate shocks (Barrett, Carrillo, & Meurer, 2021). As climate change intensifies, transitioning to sustainable agricultural systems becomes increasingly urgent to mitigate food insecurity and promote environmental conservation. In Kenya, agriculture is a critical sector that supports over 75% of the rural population and contributes significantly to national economic growth (GoK, 2020). However, the country faces growing challenges related to land degradation, erratic weather patterns, and low agricultural productivity. In this context, community-driven initiatives like the National Agricultural and Rural Inclusive Growth Project (NARIGP) offer a promising model for promoting sustainable development through locally-driven agricultural practices. This study evaluates NARIGP's impact on sustainable agricultural practices in Makueni County, Kenya, focusing on the adaptability of four value chains of mangoes, green grams, tomatoes, and chicken to climate-smart agricultural techniques. By analyzing NARIGP's successes and challenges, this study contributes to the ongoing discourse on how community-driven development (CDD) models can be optimized to ensure long-term sustainability, inclusivity, and resilience.

## **1.2 Statement of the Problem**

While numerous studies have examined community-driven development models and climate-smart agriculture (CSA) in broad terms, this research narrows in on the critical role of value chains (mango, green gram, tomato, and chicken) in fostering sustainable development in Makueni County through NARIGP. It highlights the under-researched aspect of how these value chains not only improve agricultural productivity but also enable long-term adaptability to climate-related challenges, particularly in semi-arid regions. In evaluating the success and limitations of NARIGP's interventions in these key sectors, this study provides specific insights into the mechanisms that facilitate or hinder the scalability and sustainability of community-driven agricultural initiatives. The focus on inclusivity, governance, and environmental sustainability also adds to the discourse on how to optimize the distribution of benefits in climate-smart agricultural projects, especially for marginalized groups. This research is timely in addressing gaps in how local communities can build resilience against the impacts of climate change through tailored, context-specific agricultural practices. This study therefore, uniquely contributes to the existing literature by focusing on how community-driven agricultural practices, as facilitated through the National Agricultural and Rural Inclusive Growth Project (NARIGP), can enhance climate adaptation strategies at the local level in Makueni County.

## **1.3 Research Objective**

The objective of this study was to assess how NARIGP has influenced the adaptability of communities in Makueni County to sustainable agricultural practices, particularly within the projects value chains.

## **1.4 Significance of the Study**

This study provides critical insights for a range of stakeholders, including local communities, policymakers, development partners, and agricultural practitioners, by enhancing the understanding of

community-driven development and sustainable agricultural practices. The findings offer the Makueni County government and national policy makers concrete recommendations on refining community-driven development models, such as NARIGP, to improve resource allocation, inclusivity, and long-term sustainability. These insights will inform future strategies for agricultural development and climate resilience in semi-arid regions. Firstly, international development partners, NGOs, and donor organizations will gain actionable insights into the effectiveness of NARIGP interventions, enabling more informed decisions regarding future investments in rural development programs. The research provides valuable evidence on the sustainability of project outcomes and offers a roadmap for enhancing future interventions. Secondly, for local communities, the study highlights successful practices that have improved livelihoods and identifies challenges requiring immediate action. This will empower community members to advocate for more inclusive and targeted interventions within agricultural value chains, ensuring broader distribution of development project benefits. Thirdly, Academia will benefit from the study's contribution to the literature on sustainable agriculture, community-driven development, and resilience building in rural areas. The findings from Makueni County serve as a key case study for future research on sustainable development in similar contexts globally. Lastly, addressing gaps in understanding the impact of NARIGP on community adaptability to sustainable development, the study provides recommendations for strengthening community-driven agricultural programs. These recommendations contribute directly to broader objectives of poverty reduction, food security, and environmental sustainability.

### 1.5 Theoretical Framework

This study employs **Capability Theory**, **Stakeholder Theory**, and **Participation Theory** to critically analyze NARIGP's approach to promoting sustainable agricultural practices in Makueni County.

**Capability Theory** posits that individuals and communities must be empowered with the necessary resources, knowledge, and skills to achieve sustainable livelihoods. NARIGP's focus on capacity building through training and the provision of agricultural inputs aligns with this theory, yet the exclusion of marginalized groups from decision-making processes limits the project's overall effectiveness in expanding capabilities equitably; **Stakeholder Theory** emphasizes the importance of engaging all relevant stakeholders including local governments, development partners, private sector actors, and community groups to ensure that agricultural interventions are responsive to the diverse needs of the community. NARIGP's multi-stakeholder approach has facilitated some success in promoting market access and productivity, yet significant gaps remain in ensuring the inclusion of women and youth in key decision-making forums (Njue et al., 2021); and **Participation Theory** advocates for the active involvement of communities in decision-making processes. While NARIGP's CDD model theoretically promotes participation, the findings of this study suggest that elite capture and political interference have undermined the equitable distribution of resources, limiting the full realization of community ownership in agricultural projects (Binswanger-Mkhize et al., 2010).

### 1.6 Literature Review

This section reviews the empirical and theoretical literature related to sustainable agriculture and community-driven development (CDD), with a focus on climate-smart agricultural practices and their implementation in sub-Saharan Africa. It explores global efforts to transition toward sustainable agricultural systems, the role of CDD in fostering local ownership and governance, and the specific challenges faced in promoting climate resilience in agricultural sectors. The review further narrows down to the Kenyan context, particularly Makueni County, analyzing how these global and regional dynamics

manifest locally. Through this, the literature review highlights both the opportunities and limitations in achieving sustainable agricultural development in vulnerable, resource-constrained regions.

Global agricultural systems are under increasing strain from environmental degradation, resource scarcity, and climate variability. The Food and Agriculture Organization (FAO) has stressed the need for sustainable intensification of agricultural systems to meet growing food demands while minimizing environmental impacts (FAO, 2021). Climate-smart agriculture (CSA), which integrates sustainable farming practices with climate change adaptation, is increasingly recognized as critical for achieving the Sustainable Development Goals (SDGs), particularly SDG 2, which aims to end hunger and promote sustainable agriculture (United Nations, 2015). However, the successful implementation of CSA depends heavily on local contexts, and in regions like sub-Saharan Africa, systemic barriers such as inadequate infrastructure, limited access to inputs, and governance issues hinder progress (Pretty, Attwood, & Baulcombe, 2018).

Community-driven development (CDD) models, which empower local communities to take ownership of agricultural projects, have been widely promoted as a way to foster sustainable development (Mansuri & Rao, 2013). The World Bank's review of CDD projects revealed that these models often enhance governance, transparency, and responsiveness to local needs, but they also face challenges such as elite capture, insufficient inclusivity, and variable capacity at the community level (Binswanger-Mkhize et al., 2010). These findings are critical when examining NARIGP, which operates through a CDD framework in a context of significant socio-political and environmental challenges.

In Africa, CSA has emerged as a key strategy for addressing the dual challenges of low agricultural productivity and climate vulnerability. CSA practices such as conservation agriculture, agroforestry, and rainwater harvesting have been shown to increase yields, improve soil health, and enhance resilience to climate change (Di Falco, Veronesi, & Yesuf, 2019). In a study of smallholder farmers in Ethiopia and Malawi, CSA practices were found to increase crop yields by 60% while enhancing household food security (Di Falco et al., 2019). Similarly, Mwase & Ochieng (2021) noted that sustainable land management practices in Malawi's drought-prone regions led to a 45% increase in agricultural productivity.

However, despite the benefits of CSA, many smallholder farmers in sub-Saharan Africa face significant barriers to adopting these practices, including lack of access to financial resources, inadequate extension services, and socio-political constraints (Njoroge, Mwangi, & Ochieng, 2022). Studies from Kenya's semi-arid regions underscore these challenges, revealing that while CSA can improve resilience, its adoption is often hampered by governance issues, limited market access, and the exclusion of marginalized groups such as women and youth (Muoni et al., 2019; Njue et al., 2021).

In Kenya, agriculture remains a key sector, contributing 26% to the national GDP and supporting 75% of the rural population (Government of Kenya, 2020). However, the country's agricultural systems are highly vulnerable to climate change, with increasing droughts and erratic rainfall patterns threatening productivity. To address these challenges, the Government of Kenya has implemented several initiatives aimed at promoting sustainable agriculture, including the Kenya Climate-Smart Agriculture Strategy (KCSAS), which prioritizes the adoption of CSA practices to improve agricultural productivity and climate resilience (Ministry of Agriculture, 2020). Research on the effectiveness of CSA in Kenya's semi-arid regions, including Makueni County, has shown mixed results. Muoni et al. (2019) found that

conservation agriculture, agroforestry, and rainwater harvesting had positive impacts on agricultural productivity and environmental sustainability, particularly in drought-prone areas. However, they also identified key barriers to the widespread adoption of these practices, including limited access to financial resources and extension services. Furthermore, the exclusion of marginalized groups, particularly women and youth, from decision-making processes remains a significant challenge in ensuring the long-term sustainability of CSA interventions (Njoroge et al., 2022).

Makueni County exemplifies the challenges of sustainable agricultural development in Kenya's semi-arid regions. The county's agricultural sector is dominated by rain-fed farming, which makes it highly vulnerable to climate shocks such as prolonged droughts and erratic rainfall. The introduction of NARIGP, which focuses on improving agricultural productivity through community-driven development, represents a critical intervention in addressing these challenges. By promoting sustainable land management practices and supporting key value chains of mangoes, green grams, tomatoes, and chicken, NARIGP aims to enhance both productivity and environmental conservation (Ochieng et al., 2021).

However, despite positive outcomes, such as increased produce and the adoption of CSA practices, NARIGP faces significant challenges related to governance, market access, and inclusivity. Research by Mwangi, Njoroge, & Muoni (2021) revealed that while NARIGP has improved productivity in Makueni County's mango value chain, persistent barriers related to market inefficiencies, poor infrastructure, and political interference continue to undermine the project's long-term sustainability. These challenges highlight the need for more robust governance frameworks and targeted interventions to ensure that NARIGP's benefits are equitably distributed across all community members.

### **1.7 Methodology**

This study employed an exploratory qualitative research design using a case study approach to assess the National Agricultural and Rural Inclusive Growth Project (NARIGP) and its influence on community adaptability in Makueni County. The research was conducted in Makueni County, focusing on key agricultural value chains: mangoes, green grams, tomatoes, and chickens, which are central to NARIGP's sustainable agricultural goals. The target population included members of Common Interest Groups (CIGs), Community-Driven Development Committees (CDDCs), and Makueni County government officers. A purposive sampling technique was used, resulting in a sample of 50 participants, comprising 24 CIG members, 24 CDDC members, and 2 county government officers. Data collection methods included 26 semi-structured interviews, 2 focus group discussions (FGDs) with 12 participants each, direct observation of agricultural practices, and document review. Thematic analysis was applied to analyze data, identifying key themes related to community engagement, challenges, and the impact of NARIGP on sustainable agriculture.

### **1.8 Findings**

The findings of this study present an in-depth analysis of how the National Agricultural and Rural Inclusive Growth Project (NARIGP) has influenced sustainable agricultural practices in Makueni County, Kenya. Focusing on four value chains under NARIGP in Makueni County, the findings assess the effectiveness of NARIGP's interventions in promoting community adaptability to climate-smart agriculture, increasing agricultural productivity, fostering inclusivity, and ensuring environmental sustainability. Key themes emerging from the data are discussed, including the successes and challenges



faced in implementing sustainable land management practices, improving production volumes, promoting equitable participation, and addressing environmental concerns. These insights provide a nuanced understanding of NARIGP's overall impact and the barriers that must be addressed to ensure long-term success.

### ***Adaptability to Sustainable Land Management Practices***

NARIGP has significantly enhanced communities' adaptability to sustainable land management practices, particularly through the adoption of conservation agriculture, terracing, and organic farming techniques. Farmers reported improved soil fertility, water retention, and crop yields as a result of these practices, particularly in drought-prone areas. These findings align with global studies that demonstrate the efficacy of CSA practices in enhancing resilience to climate shocks (Garzón Delvaux, Reganold, & Sander, 2020). However, political interference and limited access to agricultural inputs continue to restrict the scalability of these practices, with elite capture emerging as a significant barrier to equitable resource distribution.

### ***Volume of Production***

The study found substantial improvements in the volume of production within the mango, tomato, and green gram value chains. Farmers attributed these gains to the introduction of improved seeds, pest management techniques, and water conservation practices supported by NARIGP. However, the full potential of these productivity gains remains unrealized due to systemic barriers related to market access and infrastructure development, which have been similarly identified in broader research on sub-Saharan Africa's agricultural sector (Di Falco et al., 2019). Without stronger market linkages and value-chain integration, the economic benefits of increased production may not be fully captured by smallholder farmers.

### ***Inclusivity and Participation***

One of the most significant challenges identified in this study is the exclusion of marginalized groups particularly women and youth from decision-making processes within NARIGP's value chains. While the project has facilitated some degree of community participation, socio-cultural factors and political influence have prevented these groups from fully benefiting from NARIGP's interventions. This finding is consistent with other studies on CDD models, which often highlight elite capture and exclusion as key barriers to ensuring equitable resource distribution (Mansuri & Rao, 2013). Strengthening governance mechanisms and implementing affirmative action policies may be necessary to address these gaps and ensure that all community members are empowered to participate in decision-making processes.

### ***Environmental Sustainability***

NARIGP's promotion of environmentally sustainable agricultural practices, such as organic farming and rainwater harvesting, has had positive impacts on both productivity and environmental conservation. Farmers reported a reduction in their reliance on chemical inputs, which has contributed to improved soil health and reduced water contamination. However, concerns remain regarding the use of inorganic fertilizers, which some farmers continue to rely on due to cost and knowledge barriers. This finding highlights the need for further education and financial incentives to encourage a full transition to organic farming methods, as well as stronger environmental safeguards to mitigate the risks associated with conventional farming practices (Mwangi et al., 2021).

The findings of this study reveal both the strengths and limitations of NARIGP's community-driven approach to promoting sustainable agricultural practices. While the project has achieved notable successes in increasing productivity and promoting sustainable land management, significant challenges remain in ensuring long-term sustainability, inclusivity, and environmental stewardship. One of the key challenges identified in this study is the exclusion of marginalized groups from decision-making processes, which limits the equitable distribution of project benefits. This finding echoes broader critiques of CDD models, which often struggle with elite capture and political interference (Binswanger-Mkhize et al., 2010). Addressing these challenges will require more robust governance frameworks that prioritize transparency, accountability, and the inclusion of marginalized groups. In terms of environmental sustainability, while NARIGP has made strides in promoting organic farming and water conservation practices, the continued use of inorganic fertilizers in some areas raises concerns about the long-term environmental impact of the project. Future interventions must prioritize education on the environmental risks associated with chemical inputs and provide financial incentives to support the transition to fully sustainable practices (Garzón Delvaux et al., 2020).

### **1.9 Conclusion and Recommendations**

The study concludes that the National Agricultural and Rural Inclusive Growth Project (NARIGP) has made significant contributions to promoting sustainable agricultural practices and improving productivity in Makueni County. Communities have successfully adopted sustainable land management techniques such as terracing, intercropping, and organic manure application, leading to enhanced soil fertility, better water retention, and increased agricultural yields. This demonstrates the project's positive impact on adapting local agricultural practices to the region's semi-arid conditions. However, the study also reveals that challenges persist, particularly in ensuring the inclusion of marginalized groups, such as women and youth, in decision-making processes and resource distribution. While progress has been made, socio-cultural barriers and political interference have limited the full participation of these groups, affecting the equitable distribution of benefits. In terms of environmental sustainability, NARIGP has supported organic farming and water conservation practices, which have contributed to improved environmental stewardship. Yet, concerns remain regarding the use of inorganic fertilizers in some areas, which could lead to environmental degradation if not addressed. Lastly, although agricultural production has increased, the study highlights ongoing challenges related to market access and infrastructure, which have prevented farmers from fully benefiting from these productivity gains. Overall, NARIGP has had a positive impact on fostering sustainable agricultural development in Makueni County, but further attention is needed to address underlying social, environmental, and economic challenges. Based on the findings of this study, several recommendations are proposed to enhance the impact and sustainability of NARIGP and similar community-driven development (CDD) initiatives. These recommendations address the key challenges identified in the research, particularly in relation to sustainable agricultural practices, inclusivity, and environmental sustainability.

***Strengthening Capacity-Building and Continuous Training:*** The study found that while NARIGP successfully introduced sustainable agricultural practices, ongoing capacity-building is essential for their long-term adoption and scaling. To address this, we recommended that NARIGP implement continuous training programs for farmers, extension workers, and local leaders. These programs should focus on advanced sustainable agriculture, organic farming, and climate adaptation strategies to ensure farmers

can sustain and expand these practices. Additionally, peer-to-peer learning platforms should be encouraged, where experienced farmers mentor others, fostering knowledge exchange and promoting best practice adoption within the community.

***Enhancing Inclusivity and Participation of Marginalized Groups:*** The study highlighted significant challenges in including women, youth, and other vulnerable groups in decision-making and resource distribution. To address these issues, we recommend providing targeted financial support, such as grants, micro-loans, and subsidies, to enable marginalized groups to participate in agricultural value chains and enhance their economic resilience. Additionally, stronger gender and social inclusion policies should be enforced to ensure equitable participation in leadership, decision-making, and project implementation, with monitoring frameworks to track progress. Finally, awareness campaigns should be conducted to challenge socio-cultural barriers that limit the involvement of marginalized groups, especially women and youth, in agricultural activities and community leadership.

***Improving Market Access and Value-Chain Integration:*** The study revealed that although agricultural production increased, challenges related to market access and infrastructure hindered farmers from fully benefiting. To address this, it is recommended to collaborate with county and national governments to improve rural infrastructure, such as roads, storage facilities, and transportation networks, to enhance access to local and regional markets. Additionally, establishing formal partnerships with private sector actors, cooperatives, and trade organizations can create reliable market linkages. NARIGP should also help farmers access digital marketplaces and e-commerce platforms. Moreover, promoting agro-processing units for value addition, such as mango processing and tomato paste production, would enhance product marketability, increase shelf life, and boost profit margins for farmers.

***Promoting Environmental Sustainability:*** The findings emphasized the need to balance increased agricultural productivity with environmental conservation. To support environmental sustainability, it is recommended that NARIGP prioritize organic farming by offering financial incentives, organic input subsidies, and access to organic certification. This approach will reduce reliance on harmful chemical inputs. Additionally, more stringent environmental safeguards should be implemented, including soil testing, water quality assessments, and the use of eco-friendly inputs to monitor and mitigate the negative impacts of intensified agriculture. Furthermore, the adoption of climate-resilient technologies, such as rainwater harvesting, conservation tillage, and drought-resistant crops, should be expanded to help farmers adapt to climate change. In conclusion, these recommendations aim to address the key challenges identified in the research while building on NARIGP's successes in promoting sustainable development in Makueni County. By strengthening capacity-building, promoting inclusivity, improving market access, and ensuring environmental sustainability, NARIGP and similar initiatives can enhance community resilience, economic outcomes, and long-term adaptability to sustainable agricultural practices. Future research should focus on exploring the long-term impacts of NARIGP's interventions and identifying strategies to overcome the structural barriers that limit sustainable development outcomes.

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The author reports no conflict of interest in this work.

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