

An Assessment of Development of National Irrigation Policies in Kenya

Amir Mohamed Sirad
School of Arts and Social Sciences, Moi University, PO box 3900-30100, Eldoret, Kenya
Tel: +254 726 500 304 E-mail: amirmo99@gmail.com

Agnes Mugure
School of Arts and Social Sciences, Moi University, PO box 3900-30100, Eldoret, Kenya
Tel: +254 720 567 317 E-mail: mugureag@gmail.com

Moses Mutua Mutiso*
School of Arts and Social Sciences, Moi University, PO box 3900-30100, Eldoret, Kenya
Tel: +254 720 651 972 E-mail: mmutua@gmail.com

Abstract
The historical evolution of irrigation in Kenya spans indigenous practices, colonial initiatives, and post-independence efforts, with contemporary challenges and opportunities shaping the sector. This article analyzes the historical context, policy landscape, and challenges of irrigation development in Kenya. It emphasizes the need for policy refinement, community engagement, innovative funding, capacity building, climate-resilient practices, private sector involvement, land tenure security, financial support for farmers, market access, and robust monitoring. The paper concludes with a call for international collaboration to leverage expertise and resources for sustainable irrigation development. Despite historical setbacks and multifaceted challenges, strategic planning and collaboration are essential for realizing Kenya's irrigation potential, enhancing food security, and fostering economic growth.
Keywords: Irrigation Development, Kenya, Smallholder Schemes, Policy Framework, Climate Change Adaptation, Agricultural Productivity &Water Governance
DOI: 10.7176/JLPG/139-02
Publication date: January 31st 2024

1. Irrigation Development in Kenya

The historical evolution of irrigation in Kenya dates back to indigenous practices by communities such as the Marakwet, Ilchamus, Turkana, and Pokomo, spanning 500 years(Ngigi,1999). The formal initiation of irrigation projects occurred between 1901 and 1905 during the construction of the Kenya-Uganda railway, leading to significant schemes like Mwea-Tebere, Hola, and Perkerra by the mid-1950s(Ibid,1999). After independence, the focus shifted to large-scale tenant-based schemes managed by the Ministry of Agriculture and later the National Irrigation Board (NIB), introducing schemes like Ahero, Bunyala, and West Kano in the mid-1970s(Osoro et al 1992).

In the pre-independence era, the African Land Development Unit (ALDEV) commenced planned irrigation development around 1946, employing Mau Mau detainees for labor in schemes like Mwea, Hola, and Perkerra. Post-independence efforts continued with the establishment of NIB in 1966, overseeing schemes like Bura. The late 1960s witnessed the emergence of small-scale irrigation schemes in arid zones, supported by UNDP/FAO funds. The 1970s marked irrigation activities in Taveta and Lower Tana, while commercial irrigation expanded in the Central province, Thika, and Naivasha. (Ngigi,1999).

Institutional development played a pivotal role, marked by the formation of the Small-Scale Irrigation Development Project (SSIDP) in 1977, leading to the establishment of the Irrigation and Drainage Branch (IDB) in 1978. Over the last two decades, policy shifts have emphasized smallholder irrigation projects, aiming to foster community participation. Challenges in scheme management and sustainability persist, prompting a reevaluation of policies. (Osoro et al,1992)

The recent trend emphasizes commercialization, encouraging beneficiary participation through cost sharing, recovery, and gradual privatization. The government advocates for less intervention, promoting self-sustaining systems aligned with the proposed Agricultural Sector Investment Programme (ASIP). The 1993 guideline revisions introduced concepts like cost sharing, recovery, revolving funds, and grants, reflecting the need for sustainable irrigation development amid financial constraints. (MoALD. 1997)

Turning to the potential for irrigation in Kenya, it spans approximately 540,000 hectares, with a focus on UM 2-4 zones known for high-value crop production. Challenges such as evapotranspiration and environmental concerns necessitate targeted solutions, urging investments in climate change adaptation and farmer guidance.

While smallholder programs, led by organizations like SISDO, have successfully expanded irrigated land, larger commercial farms face hurdles related to high costs and global competitiveness. Both irrigated and rain-fed systems are crucial for addressing food insecurity; however, progress is impeded by factors like limited water resources, inadequate storage, and insufficient irrigation technologies, as noted by the Ministry of Water and Irrigation (MWI) between 2009-2010.

In the pursuit of bolstering food production, critical for Kenya's GDP growth, there is a pressing need for adopting new techniques, value addition, and market-based farming strategies. Initiatives like the Agriculture Sector Development Strategy (ASDS) and the Igniting Agriculture initiative have contributed to enhancing growth and sustainable development. Despite the potential benefits of irrigation, widespread adoption faces limitations due to high costs and the availability of food from other regions, as noted by the Food and Agriculture Organization (FAO) in 2020. The impact of climate change on crop quality has spurred renewed interest in irrigation-based production, aligning with FAO's observations in the same year.

Examining the historical context, government-managed irrigation schemes, particularly those overseen by the National Irrigation Board (NIB), have grappled with challenges and conflicts with farmers, leading to closures and reduced productivity, as evidenced in incidents like the Mwea scheme riots during the ASDS period of 2010-2020. The success of irrigation schemes hinges on effective management and improved relationships between governing bodies and farmers.

The Kenyan government's ambitious commitment to utilizing 1.3 million hectares of irrigation and drainage potential by 2030 underscores the pivotal role of irrigation in fostering economic growth and ensuring food security, as emphasized by the World Bank in 2021. However, this journey has not been without challenges, including the 2007-2008 Post-Election Violence and unpredictable rainfall patterns, prompting the initiation of the National Economic Stimulus Project to enhance maize production through irrigation (World Bank, 2021). The initial phase faced setbacks, with maize production achieving only 40% of the set target, necessitating improved coordination and information sharing among stakeholders, as acknowledged by the World Bank in 2021. Despite ambitious targets to expand irrigated areas from 120,000 to 400,000 hectares within five years, historical setbacks in government-managed irrigation programs introduce uncertainty regarding the feasibility of these goals. Successful expansion requires addressing the impacts of climate change on water availability, navigating financing challenges, and ensuring transparency in government operations, echoing insights from both FAO (2017) and the World Bank (2021). These considerations are pivotal for steering the course toward achieving the desired expansion and enhancing agricultural productivity in Kenya.

Categorizing irrigation development in Kenya involves three main groups: Public Irrigation Schemes, Smallholder Irrigation Schemes, and Private Commercial Farms. The first category includes settlement schemes managed by the National Irrigation Board (NIB) and the Bura irrigation scheme operated by the Ministry of Agriculture, following a tenant-farmer system. Other schemes managed by regional authorities, such as Yala, Sigor, Kibwezi, and Tana deltas, operate as commercial estates under different development authorities. (Ngigi,1999).

The second category, Smallholder Irrigation Schemes, can be divided into two types. The first involves schemes where irrigation infrastructure and water distribution systems are overseen by a water undertaker, such as the Yatta Furrow and Njoro Kubwa Furrow. The second comprises schemes where the Water User Association (WUA) assumes full responsibility for operating, maintaining, and distributing water among its members, including schemes like Mitunguu, Kibirigwi, Eldume, Ishiara, Kwa Kyai, and Ngaare Ndare, supported by the Ministry of Agriculture's Irrigation and Drainage Branch. (Ibid,1999).

The third category involves Private Commercial Farms, specializing in high-value crops like floricultural and horticultural products for export. Concentrated in areas like Athi River, Naivasha, Central province, Nanyuki, and peri-urban Nairobi, these farms often employ advanced technologies such as drip, sprinkler, and center pivots. The expansion of horticultural production is notable in regions like Central province, Rift Valley (especially Nakuru districts and areas near Eldoret airport), and the Mt. Kenya region. (Ibid,1999).

To gain a deeper understanding of Kenya's irrigation landscape, it's crucial to consider the country's geographical and climatic diversity. Spanning approximately 582,646 square kilometers, only 20% falls within medium to high rainfall areas where 75% of the population resides. The remaining 80% is arid or semi-arid, characterized by water deficits for agricultural production. The high rainfall zones, covering less than 20% of the productive agricultural land, support about 50% of the population and are crucial for food and cash crop production. Medium rainfall zones, covering 30%-35% of the productive land, house 30% of the population and focus on drought-tolerant crops and livestock. The arid and semi-arid lands (ASALs), receiving 200-750 mm of rainfall annually, occupy about 84% of the total land area and are primarily used as rangelands and game parks, supporting 80% of the country's livestock and 65% of its wildlife.

The Constitution of Kenya 2010 plays a pivotal role in the management of natural resources, including water for irrigation. The Fourth Schedule, Part 1 Clause 2, emphasizes the management of international waters and water resources, while Clause 22 addresses the protection of the environment and natural resources

necessary for durable and sustainable development, specifically mentioning water protection, securing sufficient residual water, hydraulic engineering, and safety of dams. Article 71 of the Constitution requires legislation on agreements related to the exploitation of natural resources to be in place before the due date, emphasizing the importance of regulating water use for irrigation. The broad definition of natural resources in Article 260 encompasses surface and ground water, aligning with the essential components for irrigation development.

Agriculture, contributing 26% directly to the GDP and another 25% indirectly, is the mainstay of Kenya's economy. It accounts for 65% of export earnings and provides more than 18% of formal employment and 70% of informal jobs in rural areas. To achieve national aspirations outlined in Kenya Vision 2030, agriculture is a key sector for poverty reduction, wealth creation, and employment. However, the sector faces challenges due to variable and unreliable annual rainfall patterns. Shifting the focus from rain-fed to irrigated agriculture is crucial to enhancing crop, livestock, and fisheries production, significantly contributing to national food security and meeting the demands of emerging export markets and agro-industries.

Despite Kenya's vast irrigation potential estimated at 1.342 million hectares, only about 13.5% had been developed by the end of 2015, leaving more than 80% untapped. The sector is categorized into public and private ownership, further divided into national and institutional for public schemes, and individual/firm or community-based for private schemes. Public-owned irrigation schemes cover 24,240 hectares, managed by entities like NIA, RDAs, NYS, Prisons, universities, and colleges. Examples include Mwea, Ahero, West Kano, Bunyala, Bura, Hola, Pekerra, and Galana Kulalu. Community-based smallholder irrigation schemes, covering 57,760 hectares, belong to individuals/groups of farmers operating as IWUAs, cooperatives, or self-help groups. Private commercial farms, covering about 53,000 hectares, account for 40% of irrigated land and produce high-value crops for local and export markets. Examples include Del Monte, Kakuzi, Finlay, Equator Flowers, and Dominion.

2. National Irrigation Policies in Kenya

Commencing with Sessional Paper No. 10 of 1965 on African Socialism and its Application to Planning in Kenya, this policy introduced the concept of African Socialism, emphasizing community-based development and equitable resource distribution. Emphasizing communal development and equitable resource distribution, this policy sought to foster a sense of community and equity. Despite its strengths, challenges emerged in reconciling socialist principles with economic development goals, leading to potential conflicts and inefficiencies. The opportunity lay in creating inclusive growth, but threats included economic pressures that strained the balance between socialism and economic development. Implementation faced difficulties due to conflicting ideologies.

Following this, the Sessional Paper No. 4 of 1981 on National Food Policy aimed to ensure national food security by promoting self-sufficiency in food production. Prioritizing food self-sufficiency, this policy provided a foundational framework for food security. Weaknesses were evident in the constraints faced during implementation, such as limited resources and external economic pressures affecting self-sufficiency goals. Opportunities included the potential to enhance domestic food production, but threats arose from economic challenges and resource constraints. Bottlenecks included the inability to fully achieve self-sufficiency due to external pressures.

The Water Act (2002) and the National Water Policy (1999) laid the groundwork for sustainable water resource management, setting the stage for enhanced irrigation practices. Emphasizing sustainable water resource management, these policies provided a legal framework for water governance. Challenges encompassed difficulties in enforcement and resource allocation. Opportunities lay in sustainable water usage, but threats included conflicting interests and difficulties in effective implementation. Bottlenecks involved the complexities of enforcing water management policies.

Moving to the late 20th century, Sessional Paper No. 1 on Economic Management for Renewed Growth marked a shift toward economic liberalization and market-oriented reforms. Introducing economic liberalization and market-oriented reforms, this policy encouraged private sector participation. Weaknesses arose from resistance, particularly in the agricultural sector, hindering reform implementation. Opportunities included stimulating economic growth, but threats emerged from resistance to reforms. Bottlenecks included challenges in aligning private sector interests with public sector goals.

The early 21st century saw policies such as the Economic Recovery Strategy for Wealth and Employment Creation (2003-2007) and the Strategy for Revitalizing Agriculture (2004-2014). These policies focused on economic recovery, wealth creation, and agriculture revitalization. The strengths varied, with the former stimulating economic growth, and the latter focusing on technology adoption and market-driven approaches. Weaknesses included uneven impacts on agriculture. Opportunities lay in technological advancements and market-driven strategies, but threats included potential disparities in sectoral growth. Bottlenecks involved coordination challenges and funding gaps.

The Agriculture Sector Development Strategy (ASDS 2010-2020) provided a comprehensive approach, integrating various aspects of agricultural development, including irrigation improvement. Adopting a holistic

approach to agricultural development, this strategy featured comprehensive planning. Weaknesses encompassed challenges in implementation, including funding gaps and coordination issues. Opportunities involved integrated agricultural development, but threats included challenges in effective implementation. Bottlenecks included complexities in coordinating multifaceted strategies.

Moving towards recent policies, the National Irrigation Policy (2016) aimed at promoting sustainable irrigation development for enhanced food security. This policy emphasized the promotion of sustainable irrigation practices and provided a dedicated policy framework. Weaknesses involved challenges in implementation, including funding and coordination issues. Opportunities lay in sustainable irrigation practices, but threats included obstacles to effective policy implementation. Bottlenecks encompassed difficulties in translating policy goals into tangible improvements.

Concluding the chronological review, the Kenya Vision 2030 outlined a long-term development blueprint for the country, encompassing various sectors, including agriculture and irrigation improvement. This long-term development plan featured a comprehensive vision for the future. Weaknesses emerged in aligning short-term policies with the long-term vision. Opportunities involved a strategic roadmap for development, but threats included challenges in maintaining alignment over time. Bottlenecks included difficulties in adapting short-term policies to evolving circumstances.

In parallel, the National Irrigation Acceleration Plan (NIAP), Agriculture Sector Transformation and Growth Strategy (ASTGS), and other contemporary policies aimed to address current challenges and pave the way for sustainable agricultural development and continued improvements in irrigation practices in Kenya. These contemporary policies focus on the acceleration of irrigation development, sector transformation, and growth strategies. Strengths include contemporary and targeted approaches. Weaknesses may arise in the face of changing circumstances. Opportunities involve addressing current challenges, but threats include unforeseen obstacles. Bottlenecks encompass the need for continuous adaptation to dynamic conditions.

3. Challenges in Irrigation Development in Kenya

The challenges confronting irrigation development in Kenya are multifaceted, encompassing various dimensions. One significant concern is the lack of a specific policy and legal framework tailored to address the unique needs and intricacies of the irrigation sector. This absence contributes to an environment where challenges persist, hindering the sector's growth and potential impact. Additionally, the under-exploited irrigation potential stems from low levels of public participation and investments, further compounded by inadequate budgetary allocation. The limited financial resources allocated to irrigation projects constrain their scale, scope, and effectiveness.

Private sector participation and investments in irrigation remain inadequate, limiting the infusion of much-needed resources, expertise, and innovation. The insufficient development of infrastructure for irrigation, drainage, and water storage poses a critical bottleneck. Poorly developed channels for participation by irrigators and weak governance of water users' and farmer associations further impede effective collaboration and coordination within the sector. Inadequate and uncoordinated information sharing in irrigation research, science, and technology creates gaps in knowledge dissemination, hindering advancements and best practices.

The challenges extend to the realm of irrigation support services, where inadequacies pose obstacles to the successful implementation and maintenance of irrigation projects. Insecure land tenure and unsustainable land use practices introduce complexities and disputes that can hinder project timelines and outcomes. The inappropriate utilization of wastewater and stormwater, coupled with the inefficient use of water resources in existing schemes, adds environmental concerns and reduces overall system effectiveness.

Moreover, farmers face challenges related to inadequate access to credit and financial services, limiting their ability to invest in irrigation technologies and equipment. The scarcity of input supplies and output markets further hampers the economic viability of irrigated farming. Limited incentives for investment in irrigation materials, technology, equipment, and machinery constrain the adoption of modern practices. Finally, the negative impacts of climate change exacerbate existing challenges, creating additional uncertainties and vulnerabilities within the irrigation sector.

Conclusion

Kenya's irrigation development has evolved through historical practices, diverse policies, and contemporary initiatives. Despite strides in expanding irrigated land and adopting new technologies, multifaceted challenges persist. The absence of a specific legal framework, limited public participation, and inadequate budget allocations hinder the sector's growth. Challenges extend to governance, infrastructure, and climate change, demanding adaptive strategies. While contemporary policies provide a roadmap, addressing historical setbacks, enhancing coordination, and navigating climate complexities are pivotal for achieving the ambitious goal of utilizing 1.3 million hectares of irrigation potential by 2030. The categorization of irrigation development reflects unique challenges and opportunities in public schemes, smallholder initiatives, and private commercial farms. As Kenya strives for enhanced food security and economic growth, strategic planning, collaboration, and

innovation remain crucial for realizing the full potential of irrigation.

Recommendations

For the advancement of irrigation development in Kenya, several key recommendations emerge from the identified challenges:

I. Policy refinement and alignment: Constantly update and refine irrigation policies to address emerging challenges and ensure alignment with long-term development visions, such as Kenya Vision 2030.
II. Community engagement and participation: Foster active community involvement in irrigation projects to enhance local ownership, sustainability, and success. Strengthen water users' associations for improved governance.
III. Investment and funding strategies: Explore innovative funding mechanisms and public-private partnerships to overcome budgetary constraints. Prioritize investments in irrigation infrastructure development, including water storage, drainage, and distribution systems.
IV. Capacity building and information sharing: Enhance capacity-building initiatives for farmers, project managers, and policymakers in irrigation management and technology adoption. Establish coordinated information-sharing platforms for irrigation research, science, and technology to disseminate best practices.
V. Climate-resilient practices: Integrate climate change adaptation strategies into irrigation planning and infrastructure development. Promote the use of climate-resilient crops and water-efficient technologies to mitigate the impacts of climate change.
VI. Private sector engagement: Encourage and incentivize private sector participation in irrigation development through policy frameworks that support investment. Facilitate partnerships between commercial farms and smallholders to leverage expertise and resources.
VII. Land tenure security: Address land tenure challenges and promote secure land use practices to minimize disputes and delays in project implementation.
VIII. Financial support for farmers: Improve farmers' access to credit and financial services to enable investments in irrigation technologies, machinery, and inputs.
IX. Market access and value addition: Enhance market access for irrigated produce through improved infrastructure and market-oriented farming strategies. Promote value addition initiatives to increase the economic viability of irrigated farming.
X. Monitoring and evaluation: Establish robust monitoring and evaluation mechanisms to assess the effectiveness of irrigation projects. Use feedback from evaluations to adapt policies and strategies in real-time.
XI. International collaboration: Collaborate with international organizations, research institutions, and donor agencies to access expertise, technology, and financial support for irrigation development.

By implementing these recommendations, Kenya can overcome existing challenges, capitalize on opportunities, and work towards achieving its ambitious goals for irrigation development, contributing to enhanced food security, economic growth, and sustainable agriculture.

References

Alila, P. O., & Atieno, R. (2016). Agricultural policy in Kenya: Issues and processes. A paper for the Future Agricultures Consortium Workshop, Institute of Development Studies, 20–22 March 2006. Future Agricultures.

Biswas, A. K. (1986). Irrigation in Africa. Land Use Policy, 3(4), 269–285.

Blank, H. G. (2000). The changing face of irrigation in Kenya: Opportunities for anticipating change in eastern and southern Africa. A SWIM Concept Paper. Nairobi: International Water Management Institute.

Chebwek, N. J. (2000). The role of the MENR in irrigation development in Kenya. In Proceedings of the 3rd Regional Workshop on Evaluation of Smallholder Irrigation and Drainage Development in Kenya, 22−25 February 2000, 8−9. Kisumu, Kenya.

FAO. (1983). World Food Security: A Reappraisal of the Concepts and Approaches. Director General's Report. Rome: FAO.

FAO. (1996). Rome Declaration on Food Security and World Food Summit Plan of Action. Rome: FAO.

FAO. (2002). The State of Food Insecurity in the World 2001. Rome: FAO.

FAO. (2009). Declaration of the World Food Summit on Food Security. Rome: FAO.

FAO. (2020). Agricultural Sector Development Strategy 2010–2020. Retrieved from https://faolex.fao.org/docs/pdf/ken140935.pdf

FAO. (2021). Global Report on Food Crises 2021. Retrieved from https://reliefweb.int/report/world/global-

report-food-crises-2021
FAO, IFAD, UNICEF, WFP, and WHO. (2021). The State of Food Security and Nutrition in the World 2021. Transforming food systems for food security, improved nutrition and affordable healthy diets for all. Rome: FAO. https://doi.org/10.4060/cb4474en.
Ngigi, S,N (1999) “Evaluation of irrigation research and development activities in Kenya”, Nairobi Kenya, IWMI
Heyer, J. (1976). Achievements, problems and prospects in the agricultural sector. In Agricultural development in Kenya: An economic assessment, ed. J. Heyer, J. K. Maitha and W. M. Senga. Nairobi: Oxford University Press.
IDB (Irrigation and Drainage Branch). (1990). Irrigation atlas of Kenya. Nairobi, Kenya: Ministry of Agriculture.
IWMI (International Water Management Institute). (1999). Draft work plan for research program supported by the African Development Bank. Colombo, Sri Lanka.
JICA (Japan International Cooperation Agency). (1992). The national water master plan (NWMP II), main report. Nairobi, Kenya: JICA and MoWD.
Kimani, J. K., & Otieno, J. O. (Eds.). (1992). Which way irrigation? Proceedings of a National Workshop, 26-29 May 1992. Nairobi: Irrigation and Drainage Branch.
Kiragu, D. K. (1992). Assessment of irrigation potential in Kenya. In Which way irrigation? Proceedings of a National Workshop, 26−29 May 1992, ed. J. K. Kimani and J. O. Otieno, 20−25. Nyeri, Kenya.
Mati, B. M. (2000). Use of GIS techniques in smallholder irrigation management and planning. In The changing face of irrigation in Kenya: Opportunities for anticipating change in eastern and southern Africa.
Ministry of Agriculture and Livestock Development (1997): Agricultural Sector Development Strategy, Government Printer, Nairobi
MoWD (Ministry of Water Development). (1980). The national water master plan (NWMP I), Nairobi, Kenya.
Ngigi, S. N. (1999). Evaluation of irrigation research and development activities in Kenya: Towards promoting small-scale irrigation technologies. Draft Project proposal for IWMI.
Njokah, J. J. (1992). Irrigation research. In Which way irrigation? Proceedings of a National Workshop, 26–29 May 1992, ed. J. K. Kimani and J. O. Otieno, 82–86. Nyeri, Kenya.
Ogombe, I. J. O. (2000). Potential and actual irrigated agriculture in Kenya: Implications for investment strategy. Paper presented during panel discussions on Investment Opportunities and Challenges in Irrigated Agriculture for National and Household Food Security, 17 July 2000 at Grand Regency Hotel, Nairobi.
Ragwa, P. K., Kamau, N. R., & Mbatia, E. D. (1998). Irrigation and Drainage Branch position. Paper presented during the Workshop on Promotion of Sustainable Smallholder Irrigation Development in Kenya, 16−20 November 1998. Kenya: Embu.
Seckler, D., Molden, D., & Barker, R. (1998). Water scarcity in the twenty-first century. IWMI Water Brief. Colombo, Sri Lanka: International Water Management Institute.
Torori, C. O., Mumma, A. O., & Field-Juma, A. (1995). Governance of water resources in Kenya. Ecopolicy Series No. 8. Nairobi: ACTS Press.
Wambuma, H. O. (2015). Diplomacy of water sharing: A case of Egypt and its Nile basin counterparts (Doctoral dissertation, University of Nairobi).
World Bank. (1987). The study and options and investment priorities in Irrigation Development Consultancy Report conducted by Xnsoconsult. Nairobi, Kenya: World Bank.