



Colonial policy, gendered technology, and women's food production in Homa Bay District, Kenya, 1902–1963

Moses Matunga Mireri¹
Pontian Godfrey Okoth, PhD²
Kizito Muchanga Lusambili, PhD³

¹mosesmatunga7@gmail.com

²pokoth@mmust.ac.ke

³kmuchanga@mmust.ac.ke

¹<https://orcid.org/0009-0007-8908-0316>

²<https://orcid.org/0000-0001-8369-9029>

³<https://orcid.org/0000-0002-5430-4558>

^{1,2,3}Masinde Muliro University of Science and Technology, Kenya

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ABSTRACT

Women were central to household food production in Homa Bay District, yet the introduction of British colonial rule transformed the institutional conditions under which they accessed land, agricultural knowledge and technology. This study examined how British colonial policies shaped women's access to agricultural technologies and influenced food production in Homa Bay District, Kenya, between 1902 and 1963. The study was guided by the Articulation of Modes of Production Theory, and Techno-Feminism Theory. The study adopted a historical research design and drew on archival records, oral interviews, Focus Group Discussions (FGDs) and secondary sources. Purposive and snowball sampling were used in the broader study to select 80 participants, comprising 56 individually interviewed respondents and 24 participants in three FGDs. Archival materials were obtained from the Kenya National Archives and regional archives, while oral evidence was corroborated with documentary and secondary sources. Data were analysed thematically and through content analysis, guided by the Articulation of Modes of Production and Techno-Feminist perspectives. The findings show that taxation and labour policies increased male labour migration and transferred greater responsibility for household food production to women. Colonial education and extension systems privileged men's access to formal agricultural knowledge, while commercial agriculture channelled technologies such as ox-ploughs, improved seeds, fertilizers and credit mainly towards male-controlled production. Land policies, the Africa Land Development schemes and the Swynnerton Plan further intensified women's labour and weakened their access to productive resources. Nevertheless, women demonstrated technological agency through intercropping, seed preservation, composting, manure application, drought-resistant crops, food preservation and the selective adaptation of introduced technologies. The study concludes that colonial agricultural modernization created a gendered technological system in which women became increasingly responsible for food security while remaining comparatively disadvantaged in access to formal technologies and institutional support. It recommends gender-responsive agricultural policies that strengthen women's access to land, credit, extension services and labour-saving technologies while recognizing and integrating women's indigenous agricultural knowledge into contemporary food-security strategies.

Keywords: Agricultural Technology; Colonial Policy; Food Production; Gendered Technology; Homa Bay; Kenya, Women

I. INTRODUCTION

Colonial intrusion fundamentally reshaped gendered access to agricultural technologies. Colonial policies such as land, labour, taxation influenced technology adoption by women in food production in Homa-Bay district. In North America, agricultural change has commonly been associated with mechanisation, scientific farming, specialized production, and the expansion of commercial markets. In Europe, agrarian modernization likewise involved the reorganisation of land, labour, knowledge, and machinery, but the benefits of technological change were not distributed evenly. Comparative agricultural and feminist technology scholarship therefore shows that innovation must be understood not only as the introduction of tools and techniques, but also as a social process shaped by institutions, property relations, and gendered authority (Snapp & Pound, 2017; Wajcman, 2004).

Across Africa, colonial rule redirected land, labour, agricultural knowledge, and production systems towards taxation, commodity production, and export markets. Women nevertheless remained central to household food production, seed management, processing, storage, and ecological adaptation, even as colonial institutions frequently

privileged male participation in commercial agriculture and formal technological channels (Bryceson, 1980; Berman & Lonsdale, 1992). In Kenya, taxation, labour recruitment, mission education, cash-crop promotion, conservation programmes, and land reform became major instruments of agrarian reordering. These interventions increasingly channelled formal access to land, extension, credit, training, and improved technologies through male household heads and recognised commercial producers (Berman & Lonsdale, 1980; Okoth-Ogendo, 1991; Onduru, 2009).

Within this Kenyan setting, Homa Bay District provides a historically significant case because women sustained food production while colonial policies altered access to land, labour, tools, knowledge, and institutional support. The article addresses the second objective of the underlying doctoral study: to examine the impacts of colonial policies on women's adoption of agricultural technologies in food production between 1902 and 1963. It specifically evaluates how taxation, labour regulation, mission education, crop commercialisation, land policy, conservation programmes, and late-colonial agrarian reform reshaped women's technological agency. The designation 'Homa Bay District' is retained historically and analytically for the study area, which formed part of South Kavirondo and later South Nyanza during colonial rule.

The central argument is that colonial agricultural change was selective, institutionally directed, and deeply gendered. Technologies that supported taxation, commodity production, and export markets received official encouragement, whereas women's food-production systems received limited investment despite their importance to household survival. Men were increasingly recognised as landowners, cash-crop producers, trainees, cooperative members, and users of mechanised equipment, while women's access to land, education, extension, credit, and implements remained mediated through male authority. The discussion follows three connected phases: administrative conquest, fiscal incorporation, and early cash-crop promotion from 1902 to 1918; labour control, mission-based agricultural training, and expanding commodity production from 1919 to 1945; and conservation campaigns, Africa Land Development schemes, the Swynnerton Plan, land registration, and agricultural intensification from 1945 to 1963. This periodisation identifies institutional change while tracing the cumulative development of gendered technological inequality in colonial Homa Bay.

1.1 Statement of the Problem

Before the establishment of colonial rule, women in Homa Bay played a central role in household food production and possessed considerable knowledge of locally adapted agricultural technologies, including seed selection, intercropping, soil management, food preservation and storage. Colonial rule, however, introduced major changes in the organization of land, labour and agricultural production. Taxation, labour recruitment, the expansion of commodity production, colonial education, agricultural extension and changes in land tenure increasingly drew men into wage labour and commercial agriculture while women remained primarily responsible for household food production. At the same time, access to introduced agricultural technologies, training, credit, land and institutional support increasingly became associated with male landholders and commercial producers.

This created an important historical contradiction. Women became increasingly responsible for sustaining household food production, yet the colonial institutions responsible for agricultural modernization did not accord them corresponding access to productive resources and technologies. Technologies such as ox-ploughs, improved seeds, fertilizers and other inputs were largely promoted within male-controlled farming systems, while women continued to depend heavily on labour-intensive indigenous practices. Land consolidation and late-colonial agricultural programmes further strengthened individualized and predominantly male control over land. Consequently, colonial agricultural change did not simply introduce new technologies; it also reshaped the social relations through which agricultural knowledge, tools, land and other productive resources were accessed and controlled.

Existing scholarship has provided important insights into colonial taxation, labour migration, land policy, commercial agriculture and gender relations in Kenya (Berman & Lonsdale, 1980, 1992; Kanogo, 2005; Okoth-Ogendo, 1991). Other studies have examined women and agricultural change in areas such as Kiambu, Nandi, Bungoma and the wider Luo region (Musalia, 2010; Nasimiyu, 1985; Nyakwaka, 2013; Tanui, 2015). However, these studies have largely treated colonial policy, gender relations and agricultural transformation as separate concerns or have focused on geographical settings outside Homa Bay. As a result, limited historical attention has been given to how different colonial policies interacted over time to shape women's access to agricultural technologies and, consequently, their capacity to sustain food production in Homa Bay District.

The historical relationship between colonial policy, gendered technology and women's food production in Homa Bay therefore remains insufficiently reconstructed. In particular, there is a need to explain how taxation, labour policies, colonial education, crop commercialization, land policies, conservation programmes and late-colonial agrarian reforms simultaneously increased women's responsibilities in food production while restricting their access to the technologies and resources associated with agricultural modernization. Examining the period from 1902 to 1963 is important because it captures the establishment, consolidation and eventual end of British colonial rule and makes it possible to trace how gendered technological inequalities developed within the colonial agrarian economy. This study



addresses this gap by historically examining how colonial policy transformed women's technological agency and food production in Homa Bay District between 1902 and 1963.

1.2 Research Objective

To examine how British colonial policies shaped women's access to agricultural technologies and influenced food production in Homa Bay District, Kenya, between 1902 and 1963.

II. LITERATURE REVIEW

2.1 Theoretical Review

The study is anchored in the Articulation of Modes of Production Theory and Techno-Feminism Theory. The two perspectives are complementary. Articulation of Modes of Production explains how colonial capitalism penetrated, reorganized and depended upon existing indigenous systems of production, while techno-feminism provides a gender-sensitive explanation of how agricultural technologies, knowledge and institutions were socially organized and distributed. Used together, they make it possible to examine colonial agricultural transformation not simply as the introduction of new farming methods, but as a process that altered relations among land, labour, technology, production and gender.

2.1.1 Articulation of Modes of Production Theory

Articulation of Modes of Production Theory developed within Marxist debates concerning the relationship between capitalist and pre-capitalist systems of production. Its central proposition is that the introduction of capitalism into a non-capitalist society does not necessarily result in the immediate disappearance of existing systems of production. Instead, capitalist production may coexist with, modify and subordinate indigenous production systems while drawing labour and surplus from them for its own expansion (Hirst & Hindess, 1975; Wolpe, 1980). Wolpe (1980) argues that capitalist development in colonial societies frequently depended upon the continued existence of indigenous subsistence economies. This relationship was particularly important in colonial Africa, where rural households continued producing food and reproducing labour even as men were increasingly incorporated into wage employment and commercial agriculture. In this arrangement, the subsistence sector was not outside colonial capitalism; it became part of the conditions through which colonial accumulation was sustained.

This perspective is relevant to the present study because colonial rule in Homa Bay did not completely eliminate indigenous agricultural production. Women continued cultivating food crops, preserving seeds, managing soils and maintaining household food supplies even as taxation, labour migration, commercial agriculture and new land policies increasingly incorporated the district into the colonial economy. The coexistence of women-controlled subsistence production and increasingly male-oriented commercial agriculture can therefore be understood as an articulation between indigenous and capitalist forms of production.

The theory is particularly useful in analysing changes in the forces and relations of production. The forces of production included land, labour, agricultural knowledge and implements, while the relations of production concerned control over labour, access to resources and the distribution of agricultural output. Colonial taxation, labour recruitment, cash-crop promotion and land reform affected both dimensions. Men were increasingly drawn into wage labour and commercial production, while women assumed greater responsibility for household food production. At the same time, access to technologies such as ox-ploughs, improved seeds, fertilizers, extension services and agricultural credit became increasingly connected to landownership, commercial farming and colonial institutions.

The theory therefore helps explain an important contradiction in colonial agricultural change: indigenous food production remained necessary for the survival of rural households and the reproduction of migrant labour, yet the sector received comparatively limited technological and institutional investment. Women's agricultural labour consequently supported both household survival and the wider colonial economy without necessarily increasing women's control over productive resources. However, Articulation of Modes of Production Theory has limitations when used alone. Its emphasis on economic structures can obscure inequalities within households and may treat rural communities as relatively undifferentiated productive units. It does not sufficiently explain why men and women occupying the same household experienced technological change differently. Nor does it adequately account for the cultural and institutional processes through which particular tools, skills and forms of agricultural knowledge came to be associated with men rather than women. For this reason, the study complements the theory with techno-feminism.

2.1.2 Techno-Feminism Theory

Techno-feminism emerged from feminist scholarship and Science and Technology Studies and challenges the assumption that technology is socially neutral. Wajcman (2004) argues that technology is produced and used within existing social relations and that gender influences its design, ownership, diffusion and application. Technology and

gender are therefore mutually constituted: technological systems can reproduce existing gender relations while gendered institutions influence who develops, accesses, controls and benefits from technology. This perspective is important to the present study because agricultural technology during the colonial period included considerably more than physical implements. It encompassed agricultural knowledge, extension services, improved seed varieties, fertilizers, soil conservation practices, credit systems, demonstration farms and the institutional arrangements through which innovations were introduced. Access to these technologies depended upon gendered relations surrounding education, landownership, household authority and colonial recognition of who constituted a legitimate farmer.

Techno-feminism therefore allows the study to question the apparent neutrality of colonial agricultural modernization. For example, an ox-plough could increase the amount of land brought under cultivation, but where ownership of cattle and ploughs remained predominantly male, women could perform more weeding, harvesting and processing without gaining control over the technology itself. Similarly, improved seeds and fertilizers could potentially increase agricultural productivity, yet their benefits depended upon access to cash, extension information, land and institutional support. Colonial agricultural technology could therefore increase production while simultaneously reproducing gender inequalities. The theory is equally useful in examining agricultural education and extension. Colonial schools, demonstration farms and extension networks frequently recognized men as commercial farmers and technological actors, while women were associated with domesticity and subsistence production. Such distinctions were not simply reflections of different tasks; they helped construct agricultural knowledge and modern technology as predominantly masculine domains.

At the same time, techno-feminism avoids treating women simply as victims of technological exclusion. Women can appropriate, modify and combine technologies according to their circumstances. In Homa Bay, this perspective provides a basis for examining women's continued use and adaptation of indigenous seed systems, intercropping, composting, food preservation and reciprocal labour arrangements alongside selectively adopted colonial technologies. Their responses demonstrate technological agency even within unequal institutional conditions. When combined, therefore, Articulation of Modes of Production and Techno-Feminism provide a coherent framework for this study. The former explains how colonial capitalism reorganized land, labour and production while continuing to depend on indigenous subsistence systems; the latter explains why access to the resulting technological system was unevenly distributed between women and men. Together, the theories enable the study to connect colonial political economy with women's everyday experiences of agricultural technology and food production.

2.2 Empirical Review

2.2.1 Colonial Policy, Land and Labour Restructuring

Studies of colonial Kenya have demonstrated that taxation, labour policy, land alienation and commercial agriculture were central to the incorporation of African communities into the colonial economy. Leys (1975) situates colonial agrarian transformation within a political economy in which African land and labour were reorganized to support settler and commercial production. Similarly, Berman and Lonsdale (1980, 1992) demonstrate that the colonial state relied on taxation, administrative coercion and labour controls to secure African participation in wage employment and commodity production.

These structural interpretations are important because they show that changes in African agriculture cannot be explained simply as voluntary responses to new markets and technologies. Agricultural modernization occurred within a political environment in which the colonial state actively shaped access to land, labour and markets. Nevertheless, broad political-economic accounts tend to discuss African households as productive units without consistently examining how the costs and benefits of these transformations were distributed between women and men.

Gender-focused studies complicate this picture. Ndeda (2015), in her analysis of male labour migration and rural women in Siaya District, demonstrates that male migration substantially increased women's agricultural responsibilities. Nasimiyu (1985) study of women in the colonial economy of Bungoma similarly shows that women's agricultural labour expanded under colonial economic restructuring even though control over major productive resources remained largely male. Taken together, these studies indicate that the removal of male labour did not simply create a labour shortage; it contributed to the feminization of subsistence agriculture.

This scholarship is relevant to Homa Bay because similar processes of taxation and labour migration affected communities in western Kenya. However, the existing studies pay greater attention to labour and gender relations than to the technological consequences of labour extraction. Less attention has been given to how the absence of male labour affected women's choice of crops, cultivation methods, soil management, access to implements and ability to sustain household food production. The present study extends this literature by treating changes in labour and changes in technology as interrelated historical processes.

2.2.2 Gendered Access to Land and Agricultural Technology

A second body of scholarship emphasizes the connection between control of productive resources and access to agricultural technology. Agarwal (1994), although writing primarily about South Asia, demonstrates that land rights significantly influence women's bargaining power and their capacity to access credit, irrigation and productive technologies. Her analysis is useful beyond the South Asian context because it demonstrates that technological adoption cannot be separated from property relations.

Similar patterns have been documented in Kenya. Tanui (2015), studying colonial policies among the Nandi, shows that land and agricultural technologies were distributed through gendered structures that privileged men. Her analysis of the ox-plough is particularly relevant because it demonstrates that technologies associated with agricultural modernization could remain under male control even where women performed substantial agricultural labour. This suggests that increased availability of technology does not automatically translate into equitable access to it. Musalia (2010) study of gender relations and food crop production in Kiambu similarly demonstrates that access to land and labour was central to women's agricultural productivity. Her work shows that gender relations shaped the resources available for food production and draws attention to the importance of analysing agricultural change through relations within households rather than merely through aggregate production figures.

Muraya (2019) study of Agikuyu women's indigenous knowledge systems in Kiambu between 1902 and 1963 goes further by demonstrating that colonial intervention disrupted women's existing agricultural knowledge. She shows that women had developed knowledge relating to seed selection, weather prediction, cultivation and food preservation but that colonial policies, commercial crops and the privileging of introduced agricultural knowledge increasingly devalued such practices. Her findings challenge the assumption that technological modernization began with colonial intervention by showing that women already possessed complex systems of agricultural knowledge. These studies establish an important connection between colonialism, gender and agriculture, but their geographical emphasis lies primarily outside Homa Bay. Moreover, the experience of Homa Bay cannot simply be inferred from Kiambu or Nandi because ecological conditions, land-use systems, fishing-agricultural interactions and Luo social organization differed. A localized analysis is therefore necessary to determine how similar colonial policies operated within the historical and ecological circumstances of Homa Bay District.

2.2.3 Colonial Education, Agricultural Knowledge and Gender

Access to technology also depended on access to knowledge. Kanogo (2005) demonstrates that colonial rule transformed African womanhood through education, Christianity, labour policy and changing cultural institutions. Colonial education did not merely provide literacy; it helped redefine appropriate economic and social roles for men and women. Girls were frequently prepared for domestic responsibilities, while boys were more directly connected to technical, commercial and public institutions. Nyakwaka (2013) study of women in Luoland provides particularly important evidence for understanding this transformation within Luo society. She argues that colonial rule formalized political and social structures that increasingly marginalized women from public decision-making. Mission education and Christianity contributed to the separation of public and domestic spheres, thereby strengthening male institutional authority.

Nyakwaka's contribution is significant because it establishes that colonial marginalization of Luo women was not simply economic. It also involved institutional and ideological changes. However, the study primarily examines political and social transformation. It gives less attention to the material consequences of this exclusion for women's access to agricultural knowledge, implements, extension services and other technologies. The present study builds upon Nyakwaka by asking how institutional marginalization translated into technological marginalization within food production.

The relationship between education and agricultural technology is particularly important because colonial agricultural knowledge was increasingly transmitted through schools, demonstration plots, cooperatives and extension officers. Where these institutional spaces were predominantly male, women could remain responsible for food cultivation while being excluded from formal instruction concerning improved seeds, soil conservation, cash crops and mechanized implements. The problem was therefore not necessarily an absence of agricultural knowledge among women but the unequal recognition and institutionalization of particular forms of knowledge.

2.2.4 Commercial Agriculture, Technology and Women's Food Production

Another strand of literature examines the expansion of commodity production. Tosh (1980) cautions against interpreting the African cash-crop revolution as a straightforward transition from traditional to modern agriculture. Commercial agriculture interacted with existing systems of production and often redirected land and labour rather than simply replacing subsistence cultivation. In South Nyanza, Onduru (2009) demonstrates that colonial rule integrated the local economy into wider commercial networks and introduced crops and agricultural implements intended to increase production. Technologies such as the iron-bladed hoe and ox-plough became increasingly visible within the

colonial agricultural economy. However, access to such implements was constrained by wealth and social position. Ox-ploughs, for example, were more readily acquired by successful livestock keepers, migrant labourers and relatively prosperous farmers.

Onduru's work is especially valuable because it places agricultural change within South Nyanza itself. It therefore brings the geographical focus closer to the present study than national studies of colonial agriculture. However, its principal emphasis is economic transformation rather than a sustained reconstruction of women's technological experiences. Questions remain about who controlled the introduced implements, how women accessed them, whether they reduced or increased women's labour and how commercial production affected technologies associated specifically with household food security.

Nasimiyu (1985) and Ndeda (2015) help illuminate this gender dimension by demonstrating that women's agricultural workload increased as men became more deeply involved in wage labour and commercial economic activities. Their findings suggest that colonial commercialization could produce a paradox: women became more important to household subsistence at the same time that men gained greater access to the resources connected to the expanding cash economy. Tanui (2015) findings reinforce this argument by showing that access to land and agricultural technology remained gendered. The significance of this literature is therefore not that women were excluded from agriculture; rather, women were deeply involved in agricultural production but did not exercise equivalent control over many of the resources associated with colonial agricultural modernization.

2.2.5 Women's Agency and Adaptation under Colonial Change

The literature also cautions against presenting rural women merely as passive victims of colonial restructuring. Berry (1993) argues that African agrarian systems were characterized by negotiation and adaptability rather than simple structural determination. Rural producers operated within changing institutional environments and used social networks, kinship arrangements and local knowledge to negotiate access to resources. This emphasis on agency is important for understanding women's food production. Colonial policies could restrict access to land, labour and institutional technology without eliminating women's capacity to innovate. Women continued selecting seeds, altering crop combinations, preserving food, managing soil fertility and organizing labour according to changing household and ecological circumstances.

Muraya (2019) work on indigenous knowledge and Nyakwaka (2013) analysis of Luo women both support the need to recover women's historical agency. Yet existing research rarely brings this agency into direct conversation with the technological structures established by colonial policy. There is consequently a risk of presenting either colonial institutions as overwhelmingly determining rural change or women's resilience as if it operated independently of those institutions. The present study instead examines adaptation within constraint: women responded creatively to colonial transformations, but the choices available to them were shaped by unequal access to land, labour, institutional knowledge and technology.

2.2.6 Synthesis of the Literature and Research Gap

The reviewed literature provides a substantial understanding of colonial political economy, agrarian change and gender relations in Kenya. Leys (1975) and Berman and Lonsdale (1980, 1992) explain the structural role of land, taxation and labour in colonial accumulation. Kanogo (2005) demonstrates how colonial rule reshaped women's social and ideological position. Musalia (2010), Nasimiyu (1985), Ndeda (2015), Muraya (2019) and Tanui (2015) show, from different Kenyan settings, that agricultural production, land access, labour and technology were profoundly gendered. Nyakwaka (2013) demonstrates how colonial institutions transformed women's position within Luo society, while Onduru (2009) provides an important reconstruction of economic and agricultural change in South Nyanza.

Despite these contributions, three related gaps remain. First, much of the scholarship treats colonial policy, gender relations and agricultural technology as separate subjects. Consequently, there is limited historical analysis of how taxation, labour policy, education, commercialization, land reform, conservation and agricultural development programmes interacted to shape women's technological opportunities.

Second, existing gender histories establish women's central contribution to agricultural labour but give less systematic attention to technology as a historical category. The question is therefore not simply how much agricultural labour women performed, but how their access to agricultural tools, improved inputs, extension knowledge, land and institutional support changed under colonial rule.

Third, although studies of Luoland and South Nyanza provide important regional insights, there remains limited district-specific historical reconstruction of the relationship between colonial policy, gendered technology and women's food production in Homa Bay across the entire period from 1902 to 1963. Existing scholarship therefore does not sufficiently explain how women simultaneously became more responsible for household food security while remaining disadvantaged within the technological and institutional structures of colonial agricultural modernization.

The present study addresses these gaps by integrating colonial policy, technological change and women's food production within a single historical analysis. It reconstructs how changes in taxation, labour, education, commercialization, land tenure, conservation and late-colonial agrarian reform shaped women's access to agricultural technologies, while also examining how women used, adapted and preserved indigenous and introduced technologies to sustain household food production. In doing so, the study moves beyond portraying women either as passive victims of colonial policy or as isolated technological adopters and instead situates their agricultural agency within the gendered political economy of colonial Homa Bay.

III. METHODOLOGY

3.1 Research Design

The study adopted a historical research design to reconstruct and interpret how colonial policies shaped women's access to agricultural technologies and food production in Homa Bay District between 1902 and 1963. Historical research involves the systematic collection, evaluation and interpretation of evidence relating to past events (Walliman, 2011). The design was appropriate because it allowed the study to draw together archival records, oral testimonies and secondary sources in explaining changes in colonial agricultural policy, gender relations and technological practices over time.

3.2 Study Area

The study was conducted in Homa Bay District, presently Homa Bay County in western Kenya. During the colonial period, the area formed part of South Nyanza and, earlier, South Kavirondo District. The establishment of an administrative post at Karungu in 1903 marked the consolidation of British colonial administration in the area (Onduru, 2009). The area is predominantly occupied by the Southern Luo and is characterized by smallholder agriculture and fishing, with agricultural production shaped by both the Lake Victoria lowlands and the upland areas. These historical, ecological and economic characteristics made Homa Bay suitable for examining changes in women's agricultural technologies and food production under colonial rule.

3.3 Target Population

The study targeted respondents with knowledge relevant to agricultural production, technological change and the socio-economic history of Homa Bay. They included male and female smallholder farmers, agricultural officers, opinion leaders, clan elders, leaders and members of women's organizations, local administrators such as chiefs, and leaders of cooperative societies. These groups provided different perspectives on changes in agricultural practices, access to productive resources and women's roles in food production.

3.4 Sampling and Sample Size

Purposive and snowball sampling techniques were used to select participants. Purposive sampling enabled the researcher to identify respondents who possessed information relevant to the study objectives, while snowball sampling allowed initial participants to identify other knowledgeable respondents (Mugenda & Mugenda, 1999). The underlying study involved 80 participants, comprising 56 individually interviewed respondents and 24 participants drawn from three Focus Group Discussions (FGDs). Each FGD consisted of eight participants, and data collection continued until saturation was reached.

3.5 Data Collection Instruments and Procedures

Data were obtained from both primary and secondary sources. Primary data were collected through oral interviews, key informant interviews, FGDs and archival research. Interview guides were used to obtain detailed accounts from smallholder farmers, clan elders, local administrators, agricultural officers, opinion leaders and leaders of relevant organizations. Key informants included agricultural and extension officers and local administrators. Three FGDs were conducted with women smallholder farmers, members of the Luo Council of Elders and agricultural experts. The discussions were held in Kadongo in Kabondo, Oyugis in Kasipul and Kendu Bay in Karachuonyo.

Archival research was conducted at the Kenya National Archives in Nairobi and regional archives in Kisumu and Kakamega. Sources included provincial and district annual and quarterly reports, taxation and labour records, memoranda, administrative correspondence, agricultural reports, land records, political record books and handover reports. These records were particularly useful in reconstructing colonial taxation, labour, education, land and agricultural policies and their implications for women's food production. Secondary sources included books, journal articles, newspapers, government policy documents, reports, and published and unpublished theses obtained from relevant institutional libraries. Evidence from archival, oral and secondary sources was corroborated to strengthen the historical reconstruction.

3.6 Data Analysis

The study used thematic and content analysis. Oral testimonies, archival documents and secondary materials were organized around themes derived from the study objective, including colonial taxation and labour policy, agricultural education and extension, land policy, commercialization, agricultural technologies and women's food production. Content analysis was used to identify recurring patterns and meanings in colonial policy documents, administrative reports and other written records. Evidence from different sources was then compared and corroborated before being interpreted through the Articulation of Modes of Production and Techno-Feminist perspectives. This approach enabled the study to develop a historical narrative connecting colonial policy with gendered technological access and women's food-production experiences.

3.7 Ethical Considerations

Ethical approval and the necessary research authorizations were obtained before data collection. Approval was secured through Masinde Muliro University of Science and Technology, including its Institutional Scientific and Ethics Review Committee (MMUST-ISERC), followed by a research permit from the National Commission for Science, Technology and Innovation (NACOSTI). Authorization was also obtained from relevant authorities in Homa Bay County. Participation in interviews and FGDs was voluntary, and informed consent was obtained from respondents before data collection. Participants were informed about the purpose of the research, and audio recording was undertaken only with their permission. All secondary and archival materials used in the study were appropriately acknowledged.

IV. FINDING & DISCUSSIONS

4.1 Taxation, Labour Policies and the Feminization of Food Production

Taxation was one of the principal instruments through which the colonial administration integrated African households into the monetary economy. The Memorandum on Native Hut and Poll Tax of 1917 demonstrates the centrality of direct taxation in colonial governance (KNA, DC/KSI/3/5, 13 October 1917). As Tarus (2004) notes, taxation was not merely a fiscal tool but a mechanism for restructuring African labour relations by compelling participation in wage employment and market exchange. In Homa Bay, taxation intensified male labour migration to settler farms, public works, and urban centres. District reports from South Kavirondo confirm the increasing reliance on African labour within the colonial economy (KNA, DC/KSI/1/2). As men left their households for prolonged periods, women assumed expanded agricultural responsibilities, effectively becoming the primary managers of subsistence production.

The study found that women increasingly undertook land preparation, planting, weeding, harvesting, seed selection, food processing, preservation, and storage. This shift was not merely a demographic adjustment but a structural transformation of rural production systems. As one Council of Elders FGD participant explained:

"Before colonial rule, families worked together and food was shared. But when men began leaving for settler farms and taxes increased, women remained alone in the farms. They worked more but controlled less." (Council of Elders FGD, Oyugis, 28 December 2025)

The phrase "worked more but controlled less" captures a central contradiction of colonial agrarian change: women's labour became indispensable to household survival, yet their control over land, income, and agricultural decision-making did not increase proportionally. This finding strongly supports Ndeda (2015), who argues that male labour migration in western Kenya intensified the feminization of subsistence agriculture. It also aligns with Nasimiya (1985), who demonstrates that colonial economic restructuring expanded women's agricultural workload. However, the Homa Bay evidence extends these arguments by showing that labour migration also had technological consequences. Labour shortages forced women to innovate within constraints shortening fallow periods, intensifying intercropping, and adopting drought-resistant crops such as cassava and sorghum to stabilize food production under conditions of labour scarcity and ecological stress.

From a theoretical perspective, this finding supports Berman and Lonsdale (1980, 1992) argument that colonial labour systems reorganized African households to sustain migrant labour. It also resonates with Wolpe's (1980) articulation of social reproduction, where women's unpaid subsistence labour underpinned the colonial labour economy. Taxation further influenced cropping patterns and land use. As cash needs increased, households prioritized market engagement, often at the expense of food production. Women's food plots were subjected to continuous cultivation and reduced fallow periods, contributing to soil exhaustion. Thus, taxation functioned not only as a fiscal policy but also as an agrarian restructuring mechanism that reshaped labour allocation, land use, and agricultural technology adoption.

4.2 Colonial Education, Extension, and Gendered Agricultural Knowledge

A second key finding is that colonial education and agricultural extension systems institutionalized gendered access to agricultural knowledge. Missionary and colonial schools differentiated curricula for boys and girls. Boys were trained in vocational and agricultural skills such as row planting, crop rotation, soil conservation, and use of improved seeds and fertilizers, while girls were directed toward domestic science, including cooking, sewing, hygiene, and childcare. This institutional separation created a long-term association between formal agricultural knowledge and masculinity, despite women's central role in food production. A women's FGD participant in Kendu Bay observed:

"Our brothers were taken to school and taught farming with lines, fertilizers, and new seeds. While girls were taught cooking and cleaning. Yet when they grew up, it was us who dug the food fields every day. They never taught the new methods." (Women Farmers FGD, Kendu Bay, 12 December 2025)

This testimony highlights a structural contradiction: those who performed most agricultural labour were excluded from formal agricultural training, while those trained in modern methods were often less involved in daily food production. The finding supports Kanogo (2005), who argues that colonial education reinforced gendered social roles. It also aligns with Nyakwaka (2013), who shows that colonial institutions increasingly confined women to domestic spheres while privileging men in public and economic domains. In Homa Bay, however, the evidence extends this literature by demonstrating that exclusion from education had direct technological consequences, limiting women's access to extension services, improved seeds, fertilizers, and conservation technologies.

Musalia (2010) similarly emphasizes that gender relations shape access to productive resources. The Homa Bay findings deepen this argument by showing that inequality extended beyond material resources to include epistemic control over agricultural knowledge. Colonial institutions constructed technological authority as masculine, despite women's extensive indigenous expertise in seed selection, soil management, and food preservation. Importantly, this finding challenges the assumption that women's lower uptake of introduced technologies reflected resistance or conservatism. Instead, access was structurally constrained. Women continued to innovate through experimentation with crop combinations, planting techniques, and storage systems, but much of this knowledge remained outside formal agricultural institutions. In techno-feminist terms, agricultural technology was socially constructed and gendered in its distribution (Wajcman, 2004).

4.3 Commercial Agriculture and Gendered Access to Agricultural Technologies

The expansion of commercial agriculture further deepened gendered inequalities in access to agricultural technologies. Colonial policy promoted cash crops such as cotton, maize, groundnuts, and sim sim in South Nyanza (KNA, DC/KSI/1/2). Onduru (2009) similarly notes that colonial integration into commodity markets encouraged the adoption of introduced agricultural implements. However, access to these technologies was highly uneven. Ox-plough ownership, for instance, was largely concentrated among men who had access to cattle, wage income, or administrative positions such as chiefs and headmen. Women rarely controlled the financial or livestock resources required to acquire such technologies.

Although ox-ploughs expanded cultivated acreage, they did not reduce women's labour burden. Instead, once larger fields were ploughed, women were responsible for planting, weeding, harvesting, processing, and storage. This created what can be described as a productivity-labour paradox: increased technological capacity led to increased female labour demands rather than labour reduction. This finding supports Tanui (2015), who shows that ox-plough technology in Nandi society was socially gendered and male-dominated. It also aligns with Nasimiya (1985), who demonstrates that technological change did not necessarily reduce women's agricultural workload. The Homa Bay evidence extends these studies by showing that technological intensification often redistributed rather than reduced labour burdens, increasing women's unpaid work within expanded production systems. Similar inequalities were observed in access to fertilizers and improved seeds. From the 1950s, fertilizers became more available in African agriculture, but access depended on purchasing power. Men, who had greater access to cash crops and wage income, were better positioned to acquire these inputs. Women, by contrast, relied more on manure, compost, and retained seed systems.

This supports Agarwal (1994) argument that access to agricultural technology is closely linked to control over land and economic resources. It also reinforces Musalia (2010) findings on the relationship between land access and food production. More significantly, the Homa Bay case reveals a dual technological system. Male-dominated commercial agriculture benefited from improved inputs, extension services, and market integration, while women's food production systems remained reliant on indigenous, labour-intensive technologies. This duality challenges modernization narratives that equate technological introduction with universal agricultural improvement. Instead, modernization was selective and politically structured, privileging export-oriented and male-controlled production systems.

4.4 Land Policy, Conservation Programmes, and Women's Productive Rights

Land policy formed a critical link between colonial governance, technology, and food production. Prior to colonial rule, Luo women accessed land through customary arrangements that granted usufruct rights for cultivation, even though ultimate authority often rested with male lineage heads (Ndeda, 2015). These arrangements ensured relatively flexible access to land for food production. Colonial land administration progressively altered these systems through administrative control, conservation enforcement, and later land consolidation and registration policies. These changes reduced land flexibility, shortened fallow periods, and intensified land use. As a result, women increasingly cultivated food crops on smaller, more intensively used plots.

This finding supports Agarwal (1994), who argues that land rights are central to women's productive capacity. It also aligns with Musalia (2010), who links land access directly to food production outcomes. However, the Homa Bay evidence extends these arguments by showing that land also functioned as a gateway to agricultural technology, influencing access to credit, extension services, and improved inputs.

4.4.1 Africa Land Development Schemes and Conservation Technologies

The establishment of the Africa Land Development (ALDEV) Scheme in 1946 marked a more intensive phase of colonial intervention in African land use and agricultural production. Its introduction followed growing colonial concern over declining soil fertility, soil erosion and reduced agricultural productivity in the African reserves. In Homa Bay and the wider South Nyanza region, these environmental problems were associated with recurrent droughts, food shortages, land pressure and continuous cultivation. The colonial administration responded by promoting soil conservation and more intensive land use as part of a broader programme of agricultural betterment (KNA, DC/KSI/1/15, South Nyanza District Annual Report, 1946).

ALDEV was intended to promote soil conservation, intensify agricultural production and reorganize African farming practices. Its measures included terracing, contour ploughing, reforestation, composting, manuring, trenching, grass contouring and the cultivation of root crops such as cassava and sweet potatoes. In 1947, district authorities also encouraged the construction of trash lines between farms and the use of manure to restore soil fertility. An Agricultural Betterment Fund was subsequently established in 1949 to finance anti-soil erosion activities, while soil-conservation courses were organized in Kisii for selected farmers from the region (Ndege, 1987). Agricultural reports from South Kavirondo similarly identified soil exhaustion as a major problem and promoted manure application, trenching and other conservation measures (KNA, DC/KSI/7/1, Agricultural Reports, 1943–1946).

Although these interventions were officially presented as technical responses to environmental degradation, the study found that their implementation also reflected the coercive character of colonial administration. Focus Group Discussions with women smallholder farmers in Kabondo indicated that some community members understood soil-conservation measures less as voluntary environmental reforms than as compulsory colonial obligations. Participants recalled that people were required to dig terraces and plant trees under the close supervision of chiefs, sometimes without clearly understanding the purpose of the measures. Conservation technology therefore became intertwined with colonial systems of labour mobilization, administrative supervision and social control.

This finding supports Berman (1990) argument that colonial development programmes frequently combined economic and technical objectives with mechanisms of political regulation. The Homa Bay evidence further shows that environmental conservation cannot be separated from the wider colonial restructuring of land and labour. As African communities experienced increasing pressure on available land, practices such as long fallowing and shifting cultivation became increasingly difficult to maintain. Conservation programmes therefore attempted to address forms of soil degradation that were themselves partly associated with the changing land-use conditions created under colonial rule.

Women experienced these interventions particularly strongly because they remained primarily responsible for household food production and day-to-day soil management. They participated extensively in terracing, composting, manure application, contour farming and the maintenance of grass strips while continuing to undertake planting, weeding, harvesting, food processing and domestic responsibilities. An oral interview with Elizabeth Oketch captured this additional burden:

"Women dug terraces, carried manure, and planted grass strips while still cultivating food crops for the family." (Elizabeth Oketch, Oral Interview, 30 October 2025)

The testimony demonstrates that conservation programmes depended significantly on women's unpaid labour. Although the measures could improve soil fertility and reduce erosion, the manner in which they were implemented added another layer of work to women who were already carrying an increasing share of household agricultural production. This finding is consistent with Mackenzie (1991), who demonstrates that colonial conservation policies in Kenya frequently depended upon women's labour even though women had limited influence over the institutions that designed and administered such programmes.

The gendered nature of ALDEV was also evident in access to agricultural training and institutional support. Soil-conservation courses were organized for farmers, but evidence from the study suggests that opportunities for formal training were not evenly distributed. Chiefs, wealthy farmers and mission-educated men were more likely to participate in training and interact directly with agricultural officers. Women thus supplied much of the labour required to implement conservation measures while having comparatively less access to the formal knowledge, authority and institutional resources surrounding those technologies. In this respect, conservation policy reproduced the wider colonial pattern in which women were recognized primarily as agricultural labourers rather than as technological decision-makers.

Nevertheless, women did not simply reproduce colonial conservation practices exactly as they were prescribed. Oral evidence indicates that they selectively incorporated introduced techniques into existing indigenous systems of soil and crop management. Elizabeth Oketch, for example, recalled that women combined manure application with traditional intercropping because declining soil fertility required them to adapt their farming practices. This illustrates that women actively evaluated and modified introduced technologies rather than accepting them passively.

Such adaptations included combining compost and manure with intercropping, retaining locally adapted crops and incorporating erosion-control measures into established farming practices. The finding supports Muraya (2019) argument that women's indigenous agricultural knowledge remained an important basis for responding to colonial agricultural change. It also demonstrates that indigenous and introduced technologies did not exist as two entirely separate systems. Rather, women produced a hybrid technological practice in which useful elements of colonial conservation were incorporated into locally developed systems of soil fertility management and food production.

The Homa Bay evidence therefore qualifies any interpretation of ALDEV as merely a technical programme for environmental improvement. The programme introduced useful soil-conservation practices, but its effects were mediated by colonial administrative authority, gender relations and unequal access to agricultural knowledge. Women carried a substantial share of the labour required to implement conservation while men were more likely to gain access to formal training and institutional support. At the same time, women demonstrated considerable technological agency by adapting conservation practices to local ecological conditions and combining them with indigenous agricultural knowledge. ALDEV in Homa Bay consequently reveals the wider contradiction of colonial agricultural modernization. The colonial state sought to preserve agricultural productivity through new conservation technologies, yet the programme relied heavily on the labour of women whose food-production systems received comparatively limited institutional investment. Conservation therefore improved some aspects of land management while simultaneously reinforcing gendered inequalities in agricultural labour, technological authority and access to formal support.

4.4.2 The Swynnerton Plan and Individualized Landholding

The Swynnerton Plan of 1954 aimed to transform African agriculture through land consolidation, registration, credit provision, and promotion of commercial farming (Swynnerton, 1954). It assumed that secure individual tenure would encourage investment and technological adoption. In Homa Bay, however, the Plan had significant gendered implications. Formal land registration strengthened male household heads' control over land, while women's customary cultivation rights became less secure. Since access to credit, extension services, and improved inputs increasingly depended on formal land ownership, women were structurally disadvantaged in accessing agricultural technologies.

This finding supports Tanui (2019), who highlights historical gender inequalities in land ownership, and Agarwal (1994), who links land rights to bargaining power and technological access. Nasimiyu (1985) similarly notes that weakened land rights constrained women's economic agency despite their central role in production. However, the Homa Bay evidence also shows that implementation was uneven due to persistent customary practices and land fragmentation. Nonetheless, the Swynnerton framework institutionalized a long-term shift linking land ownership to technological access, reinforcing gender disparities in agricultural modernization.

4.5 Women's Technological Agency and Continuity of Food Production

Despite structural constraints, women were not passive recipients of colonial agricultural change. The findings show that they actively adapted agricultural systems in response to labour shortages, land pressure, and limited access to formal technologies. Women intensified intercropping, preserved indigenous seed varieties, used compost and manure, cultivated drought-resistant crops such as cassava and sorghum, and maintained reciprocal labour systems. These practices ensured household food security under increasingly constrained conditions.

This finding supports Berry (1993), who emphasizes African farmers' adaptive strategies in response to institutional change. It also aligns with Muraya (2019), who highlights women's role in sustaining indigenous agricultural knowledge systems. However, the Homa Bay evidence extends this literature by showing that women's

adaptation was both innovative and constrained. While these practices demonstrate technological agency, they also reflect limited access to formal agricultural support systems such as extension services, credit, and improved inputs. Thus, women's resilience should not be interpreted as evidence of colonial policy neutrality. Instead, it reflects adaptive survival within structurally unequal systems.

4.6 Overall Pattern of Colonial Policy, Gender, and Agricultural Technology

Overall, the findings demonstrate that colonial agricultural transformation in Homa Bay was deeply gendered. Taxation and labour migration increased women's agricultural workload; education and extension systems privileged men's access to agricultural knowledge; commercialization concentrated technological benefits in male-controlled production; and land and conservation policies increased women's labour while limiting their access to productive resources. While the findings broadly support existing scholarship (Berman & Lonsdale, 1980; Kanogo, 2005; Nasimiyu, 1985; Musalia, 2010; Tanui, 2019; Agarwal, 1994; Muraya, 2019), they extend it by placing agricultural technology at the centre of colonial gender relations.

The study's key contribution is the identification of a gendered technological contradiction: women became central to food production but were systematically excluded from formal agricultural knowledge systems, credit structures, and improved technologies. Colonial modernization therefore produced a dual agricultural system—commercial, male-oriented agriculture supported by institutional technologies, and subsistence, female-managed agriculture sustained through indigenous and labour-intensive methods. At the same time, women maintained significant technological agency through adaptation, innovation, and hybridization of indigenous and introduced practices. The history of colonial agriculture in Homa Bay is therefore best understood as a dynamic interaction of structural exclusion, labour intensification, and women's technological creativity.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study examined how British colonial policies shaped women's access to agricultural technologies and influenced food production in Homa Bay District between 1902 and 1963. The findings demonstrate that colonial agricultural transformation was not gender neutral. Taxation and labour policies drew men increasingly into wage employment and commercial activities, leaving women with greater responsibility for household food production. At the same time, colonial education, agricultural extension, commercialization and access to improved technologies increasingly favoured men. The study further established that the introduction of technologies such as ox-ploughs, improved seeds and fertilizers did not necessarily reduce women's agricultural burden. In some cases, these technologies expanded cultivated acreage while increasing women's responsibilities for planting, weeding, harvesting, processing and storage. Colonial agricultural modernization therefore produced a gendered technological contradiction in which women became increasingly responsible for food security while having comparatively limited access to the technologies, land, training, credit and institutional support associated with agricultural modernization.

Land and conservation policies reinforced these inequalities. ALDEV conservation programmes depended substantially on women's labour, while late-colonial reforms associated agricultural modernization increasingly with individualized landholding, commercial production, credit and extension services. These arrangements placed women, whose access to land remained largely mediated through male household and lineage structures, at a disadvantage. Nevertheless, women were not passive recipients of these changes. They responded to labour shortages, declining soil fertility and restricted access to formal technologies by adapting indigenous agricultural knowledge and selectively incorporating introduced practices. Intercropping, seed preservation, composting, manure application, food preservation and the cultivation of resilient crops such as cassava and sorghum remained important strategies for sustaining household food production.

The study therefore concludes that colonial agricultural change in Homa Bay produced an unequal technological system in which institutionally supported commercial agriculture increasingly favoured men, while women sustained household food production through comparatively labour-intensive and under-resourced systems. The contribution of the study lies in demonstrating that the relationship between colonial policy and women's food production cannot be understood without examining the gendered organization of agricultural technology, knowledge and productive resources.

5.2 Recommendations

Based on the findings, the study recommends that contemporary agricultural policy and development programmes in Homa Bay should recognize the historical roots of gender inequalities in access to land, agricultural technologies and institutional support. Agricultural interventions should deliberately strengthen women's secure access to productive land, credit, farm inputs and technologies rather than assuming that resources directed to

households automatically reach women food producers. Agricultural extension and training programmes should recognize women as primary agricultural producers and ensure their direct access to technical knowledge, demonstrations and agricultural innovations. Particular attention should be given to technologies that reduce labour demands in food production rather than concentrating support primarily on commercially oriented farming.

The County Government of Homa Bay and relevant national agricultural institutions should strengthen soil restoration and sustainable land-management programmes while ensuring that conservation responsibilities do not disproportionately increase women's unpaid labour. Such programmes should combine appropriate scientific technologies with locally developed practices in soil fertility management, intercropping, seed preservation and crop diversification. Finally, women's indigenous agricultural knowledge should be documented, recognized and incorporated into agricultural training, food-security planning and climate-resilience programmes. Treating women not merely as recipients of agricultural technologies but as producers of agricultural knowledge and innovation would help create a more inclusive approach to agricultural development and food security.

Declaration of Interest

The authors declare that they do not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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