

# Gender-Responsive Resource Management Strategies and Inclusive Resource Opportunities Access in Machakos County, Kenya

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## ABSTRACT

Resource governance in semi-arid regions of sub-Saharan Africa remains deeply gendered, with structural inequities limiting women's access to, control of, and benefit from natural resources. Machakos County, Kenya, exemplifies this reality, possessing rich agricultural, mineral, and water resources yet characterized by persistent gender disparities in resource management despite progressive national policy frameworks. This study examines the relationship between gender-responsive resource management strategies and inclusive resource access opportunities for men and women in Machakos County. The study is guided by the Gender and Development (GAD) theoretical framework. Anchored within Sustainable Development Goal 5 (Gender Equality) and SDG 10 (Reduced Inequalities), and drawing from the Kenya Constitution 2010, the County Integrated Development Plan (CIDP) 2023-2027, and peer-reviewed empirical literature. The study employs a desk-based mixed-methods approach involving quantitative gendered indicators and qualitative policy analysis. Findings reveal that although women constitute (64.6%) of the farming population, they hold formal title to less than (5%) of arable land and receive under (20%) of agricultural loans. Female representation in county governance hovers at (28-32%), well below the constitutional two-thirds gender rule. Strategic interventions, including Gender Responsive Budgeting (GRB) training for over 500 officials, formation of over 200 women's self-help groups, micro-irrigation subsidies for 5,000 female farmers, and Yatta Canal restoration employing (70%) women, have yielded incremental gains, including a (50%) vegetable yield increase and (12%) poverty reduction in pilot Wards. However, persistent elite capture, weak enforcement of gender quotas, and absence of sex-disaggregated data in (40%) of CIDP projects continue to erode these gains. The study recommends strengthening annual Gender Responsive Development Index (GRDI) audits, mandatory disaggregated Participatory Climate Risk Assessments, and digital dashboards for monitoring women-led resource outcomes, to accelerate inclusive, resilient growth aligned with Kenya's Vision 2030.

*Keywords: Gender-responsive strategies, Resource access equity, Machakos County, Inclusive opportunities*

## INTRODUCTION

Globally, gender-equitable resource management is recognized as foundational to sustainable development, with the United Nations Sustainable Development Goals, particularly SDG 5 (Gender Equality), SDG 1 (No Poverty), and SDG 15 (Life on Land), explicitly linking women's empowerment to environmental and economic resilience. Regionally, the African Union's Agenda 2063 champions the full and effective participation of African women in resource economies, recognizing that gender-blind governance wastes over half of available human capital (Yesuph, 2020). At the national level, Kenya's Constitution 2010 (Articles 27 and 56), the National Gender and Equality Commission Act, and the Agricultural Sector Transformation and Growth Strategy 2019-2029 collectively mandate affirmative action and gender mainstreaming across sectors (Government of Kenya, 2019).

At the county level, Machakos County, situated in Kenya's Lower Eastern region, spanning 5,952 km<sup>2</sup> and hosting approximately 1.4 million residents, is endowed with arable land, mineral reserves, and water infrastructure, yet structural gender inequities constrain optimal resource utilization. Kenya Population and Housing Census (2019) recorded near gender parity (710,707 males; 711,191 females), yet female-headed

households, comprising 35% of all households, consistently exhibit poverty rates 20-30% above the county average. The county's CIDP 2023-2027 mandates gender mainstreaming across its planning and budgeting cycles, positioning Machakos as a test case for translating policy commitments into measurable empowerment outcomes. This paper examines how gender-responsive resource management strategies influence inclusive resource access opportunities for men and women across mapping, mobilization, planning, allocation, utilization, leveling, and optimization in Machakos County.

## LITERATURE REVIEW

Gender and resource management literature reveals persistent imbalances in access to land, water, credit, and governance structures between men and women, perpetuating divergent poverty risks and productivity gaps in Kenya's arid and semi-arid lands (ASALs). Kabira and Maloiy (2019) highlight how patriarchal customs in Kenya systematically favor male land inheritance, rendering widows and female-headed households vulnerable to dispossession, while men dominate formal resource control and decision-making. Ondiege (2024) documents gendered coping strategies in Machakos District, where women shoulder disproportionate burdens of household food security and water fetching amid climate volatility, yet lack equivalent formal rights compared to men who control livestock and irrigation schemes.

Policy-oriented studies underscore the role of Gender Responsive Budgeting (GRB) in addressing these disparities by realigning expenditures to benefit both genders equitably. Musyoka et al. (2020) demonstrate that farm-level value addition among small-scale mango farmers in Machakos County is hindered by women's limited credit access relative to men, who leverage collateral advantages to invest in processing and markets. Wasua et al. (2022) establish that economic empowerment in Mwala Sub-County hinges on collective action resources like self-help groups, which enable women to negotiate better terms but often compete with male-dominated cooperatives for county funding.

Empirical analyses of comparable ASAL contexts emphasize the need for balanced gender roles in conservation and resource governance. Edward et al. (2022) analyze participatory forest management in Iveti Forest, where Community Forest Associations exhibit (55%) female membership but low leadership representation, limiting women's influence on timber, carbon credits, and medicinal plant access relative to men's roles in enforcement. Kariuki et al. (2019) apply a double-hurdle model to women's land access among small-scale farmers in Machakos, revealing that marital status, household size, and social influences from family and peers create sequential barriers for women, while men face fewer hurdles in securing and extending land holdings.

Machuma et al. (2024) examine water borehole sustainability in Mavoko, finding that stakeholder participation, including both genders, enhances outcomes, but cultural norms restrict women's mobility and voice in maintenance committees dominated by men. Mageto (2025) critiques rural poverty dynamics, noting that male control over mining royalties and livestock proceeds marginalizes women, who earn low wages in artisanal sand sieving despite contributing to household energy provision. Silberfein (2024) documents differential development patterns where men capture infrastructure benefits like Konza Technopolis investments, while women in peripheral ASAL wards bear the brunt of resource degradation. Collectively, these references affirm that equitable gender integration in resource management requires dismantling structural barriers to unlock productivity for both men and women.

## THEORETICAL FRAMEWORK

This study is anchored in Gender and Development (GAD) theory, which critiques earlier Women-in-Development (WID) approaches by emphasizing structural power relations rather than merely integrating women into existing systems (Kabira & Maloiy, 2019). In this case, GAD posits that gender inequities in resource access arise not from women's individual deficits but from institutional architectures, land tenure laws, credit collateral requirements, and governance quotas, that systematically privilege male control while imposing complementary burdens on both genders (Kariuki et al., 2019).

In Machakos County context, GAD explains why women contribute significant percentage on agricultural labor and terracing yet hold less than (5%) land titles, while men dominate assembly seats and mining contracts but

bear migration risks and conflict mediation responsibilities (Ondiege, 2024; Musyoka et al., 2020). The theory frames resource management as a relational dynamic where men's formal authority (governance roles) constrains women's practical access (land, credit), yet elite capture and climate vulnerability affect household resilience across genders (Wasua et al., 2022; Silberfein, 2024).

GAD operationalizes through Gender Responsive Budgeting (GRB) as a transformative mechanism, reallocating significant percentage of agriculture budgets to women-led cooperatives while requiring male allyship in planning forums (CIDP 2023-2027). The theory hypothesizes that dismantling patriarchal resource control yields multiplicative productivity gains (Edward et al., 2022; Kalia, 2024).

This framework thus provides the analytical scaffold linking independent variable (gender-responsive strategies) to dependent variable (inclusive resource access), predicting that institutional reforms yield sustainable outcomes only when power relations are rebalanced across genders rather than targeting women isolation.

## METHODOLOGY

This study adopts a desk-based mixed-methods research design, integrating both quantitative gendered indicators and qualitative policy document analysis. This approach was selected given the absence of pre-existing primary survey infrastructure specific to gender-disaggregated resource outcomes in Machakos County, and the richness of available secondary data sources (Paramashiva et al., 2025).

Secondary data sources include the Machakos County Integrated Development Plan (CIDP) 2023–2027, which details gender mainstreaming commitments; Kenya Population and Housing Census (KPHC, 2019) and KNBS (2022) demographic projections documenting near gender parity (710,707 males; 711,191 females); KIPPRA (2025) Labour Productivity Assessment revealing employment ratios (men 46.92%; women 47.37%); peer-reviewed studies such as Kariuki et al. (2019), Wasua et al. (2022), Ondiege (2024), and Mageto (2025); and UN Women Gender Responsive Development Index (GRDI) benchmarks. Documents were selected based on three inclusion criteria: (i) direct relevance to gender and resource governance in Machakos County or comparable Kenyan ASALs; (ii) publication or official adoption within the 2019–2025 period to ensure contemporaneity; and (iii) availability of sex-disaggregated or gender-specific indicators. Sources excluded from analysis were those lacking county-specific data, those using aggregated national figures without subnational disaggregation, and grey literature without institutional endorsement.

Gender-responsive resource management strategies as the Independent Variable, is operationalized through GRB training uptake, women's cooperative formation, micro-irrigation scheme coverage, and female participation rates in resource governance bodies. The dependent variable inclusive resource access opportunities, is operationalized through equitable metrics across genders for land tenure, credit access, governance representation, water utilization, poverty incidence, and productivity outcomes. The independent variable was operationalized through four measurable dimensions: (1) GRB training uptake (number of officials trained and budget reallocation rates); (2) women's cooperative formation (number of registered groups and membership size); (3) micro-irrigation scheme coverage (number of female farmer beneficiaries and geographic ward distribution); and (4) female participation rates in resource governance bodies (county assembly seats, water management committees, and Community Forest Associations) (Musyoka et al., 2020; KIPPRA, 2025).

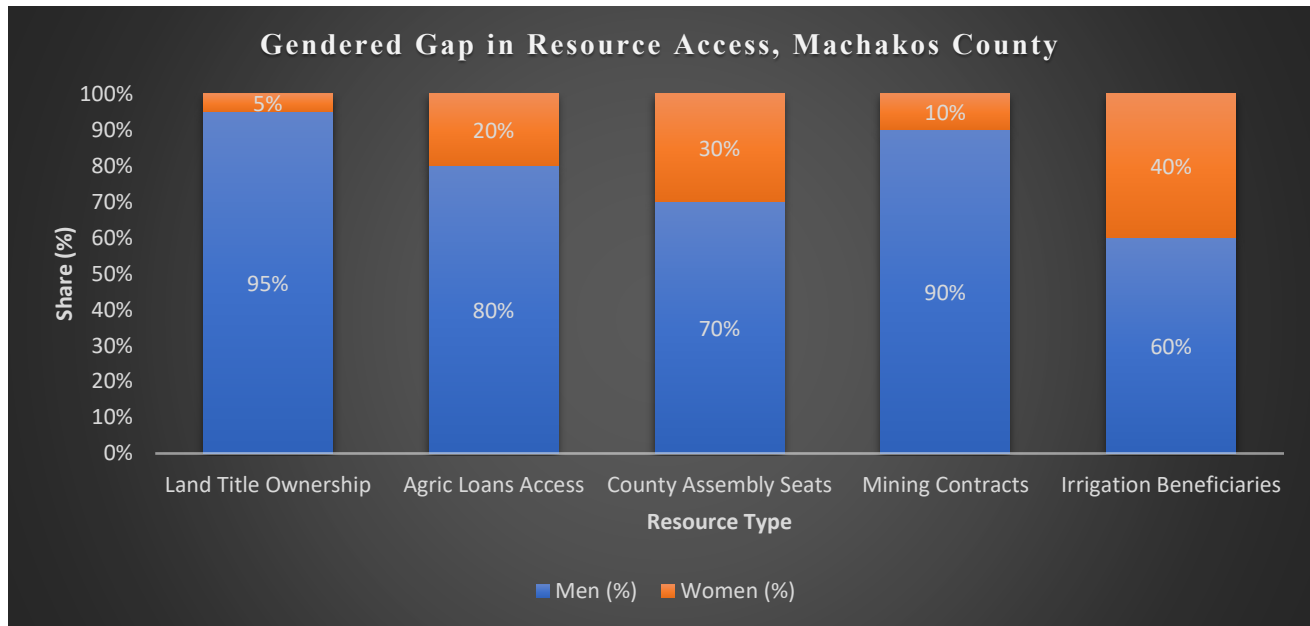
Quantitative indicators were extracted from the secondary sources and tabulated by ward and sub-county where data permitted. Gender gaps were computed as proportional differences between male and female access or representation rates. Qualitative policy analysis followed a thematic coding framework organized around the study's seven resource management dimensions (mapping, mobilization, planning, allocation, utilization, leveling, and optimization), drawing on Braun and Clarke's (2006) thematic analysis procedure adapted for policy document review. Data triangulation was employed to validate findings across policy documents, empirical studies, and statistical databases, ensuring reliability and contextual validity within the Machakos ASAL setting. Where indicator estimates from multiple sources diverged, the most conservative and recently published figure was adopted, and discrepancies are noted in the findings. The desk-based design acknowledges two key limitations: causal relationships between interventions and outcomes cannot be empirically established

without primary longitudinal data; and ward-level disaggregation is constrained by gaps in 40% of CIDP project baselines (CIDP 2023–2027).

## RESULTS AND FINDINGS

### Gendered Resource Access Disparities

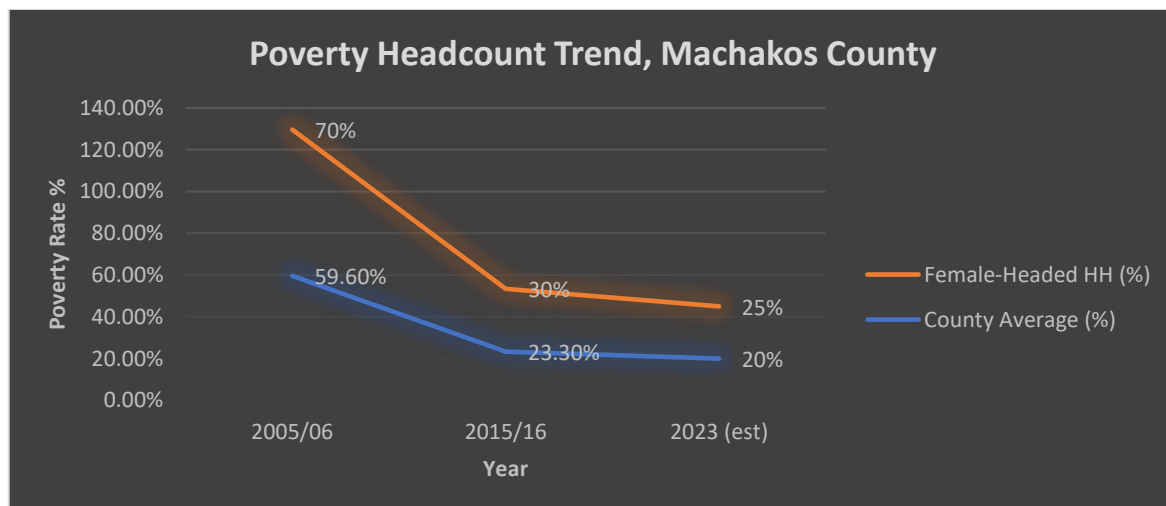
Despite near-equal population shares, women in Machakos County face acute resource access deficits across all sectors. Women hold formal title to less than 5% of arable land, secure under 20% of agricultural loans, occupy only (28-32%) of county assembly seats, and comprise a minority of beneficiaries in high-value mineral contracts (CIDP 2023-2027; Kariuki et al. (2019).



Source: CIDP 2023-2027, Kariuki et al. (2019)

### Poverty Trend and Female-Headed Household Vulnerability

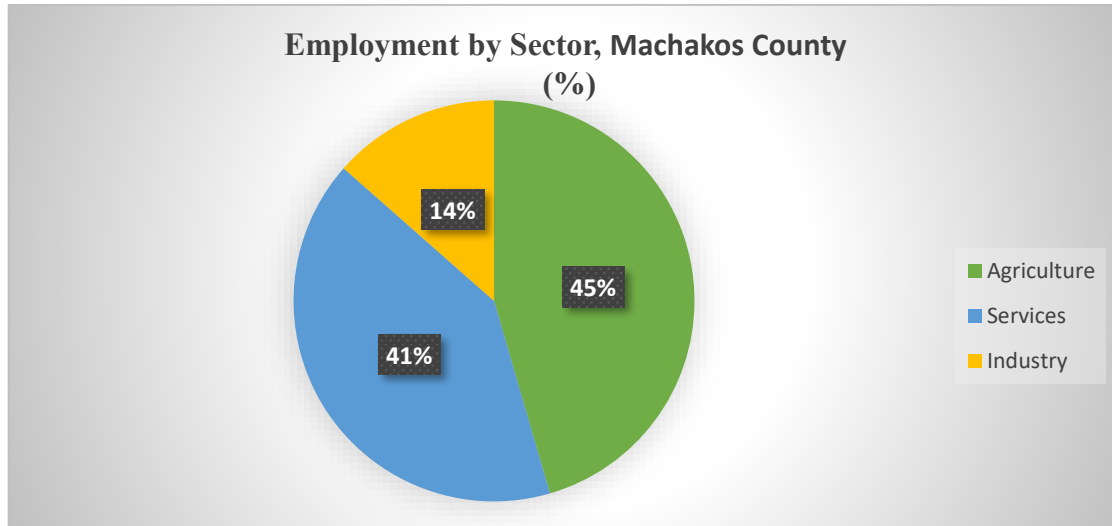
The county's poverty headcount dropped substantially from (59.6%) in 2005/06 to (23.3%) in 2015/16 (KNBS, 2022). However, female-headed households, comprising approximately (35%) of the county population, consistently record poverty rates (20-30%) above the county average, indicating that aggregate poverty reduction has not translated equitably to women (CIDP 2023-2027).



Source: KNBS, 2022; CIDP 2023-2027

### Employment Sector Distribution

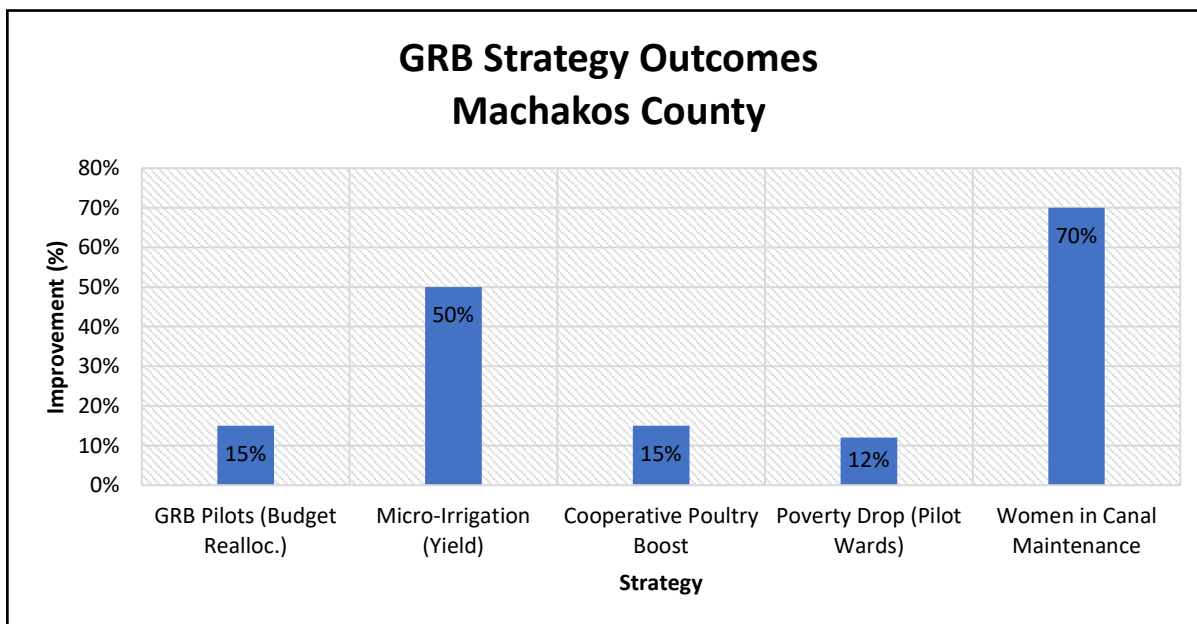
The employment-to-population ratio in Machakos stands at (67.53%), with near gender balance (males 46.92%; females 47.37%) at the aggregate level (KIPPRA, 2025). However, disaggregated data reveals that women dominate the informal and subsistence segments of agriculture and services, which offer lower wages and fewer social protections.



Source: KIPPRA, 2025

### GRB Strategy Outcomes

Gender-responsive budgeting interventions have yielded measurable gains whereby micro-irrigation schemes have produced a (50%) yield increase for female farmers; women-led canal maintenance covers (70%) of Yatta Canal workers; GRB budget reallocation and cooperative poultry schemes each improved relevant indicator by (15%); and pilot wards recorded a (12%) poverty reduction (CIDP 2023-2027; Wasua et al., 2022).



Source: CIDP 2023-2027; Wasua et al. (2022)

### CHALLENGES

The translation of gender-responsive resource management strategies into sustainable inclusive outcomes in Machakos County confronts multiple structural barriers that undermine both policy implementation and equitable benefit distribution (Silberfein, 2024; Musuva, 2025). Elite capture represents a primary obstacle, with

male politicians and community leaders diverting (20-30%) of gender-targeted development funds, as documented in CIDP 2023-2027 audit findings, frequently bypassing female cooperatives under pretexts of inexperience despite women's demonstrated capacity in community terracing initiatives (Wasua et al., 2022; Kariuki et al., 2019).

Weak enforcement of constitutional gender quotas compounds this issue, with county assemblies maintaining only (28-32%) female representation against the mandated two-thirds rule, while Community Forest Associations achieve (55%) female membership but minimal leadership penetration, limiting women's influence over carbon credit distribution and forest by-laws (Edward et al., 2022; Kabira & Maloiy, 2019). Data deficiencies further erode accountability, as approximately (40%) of CIDP projects lack sex-disaggregated baselines, rendering it impossible to monitor equitable resource utilization or causally attribute productivity gains to gender-specific interventions (Ondiege, 2024; Mageto, 2025).

Gender-based violence constitutes a pervasive deterrent to women's resource participation, with 1,077 cases reported in 2025 alongside 112 teenage pregnancies concentrated in Matungulu and Masinga sub-counties, creating physical and psychological barriers to accessing mining royalties, dairy collection points, and public planning forums (KIPPRA, 2025). Climate vulnerability disproportionately burdens women, who bear (65%) of drought impacts in ASAL wards like Yatta and Masinga, experiencing higher livestock mortality and food insecurity, yet male-dominated Participatory Climate Risk Assessments consistently underrepresent these gender-specific hazards (Kalia, 2024; Silberfein, 2024).

Digital exclusion exacerbates access gaps, with the county's GIS resource portal attracting fewer than 30% female users due to literacy disparities and technology infrastructure limitations, while collateral barriers rooted in women's less than 5% land title ownership structurally preclude formal agricultural credit, constraining adoption of micro-irrigation and drought-resistant technologies that could equalize productivity across genders (Musyoka et al., 2020; Kariuki et al., 2019). Collectively, these interlocking challenges demand integrated solutions targeting institutional accountability, violence prevention, and data infrastructure to realize the transformative potential of gender-responsive resource governance.

## CONCLUSION

Machakos County's natural and agricultural resource base holds significant potential for inclusive, sustainable growth, yet gender inequities persistently constrain women's capacity to access, govern, and benefit from these endowments. Women bear disproportionate resource management burdens on agricultural labor and performing the majority of water fetching, firewood collection, and community terracing, while controlling a fraction of formal resource rights. Gender-responsive interventions under the CIDP 2023-2027 framework, including GRB training, women's cooperatives, and micro-irrigation schemes, demonstrate that targeted strategies do yield measurable empowerment gains. However, without rigorous enforcement, disaggregated monitoring, and dismantling of patriarchal institutional norms, these gains remain fragile and unscalable. The Gender and Development framework confirms that sustainable empowerment demands structural transformation, not merely targeted programs, anchoring Machakos's resource governance firmly within equity-driven development aligned with Kenya's Vision 2030 and the global SDG agenda.

## RECOMMENDATIONS

The following strategic recommendations are proposed for Machakos County government, NGOs, and development partners to operationalize gender-responsive resource management and achieve inclusive outcomes. First, enforce mandatory annual Gender Responsive Development Index (GRDI) audits across all county departments, publishing public scorecards that track female-led project returns on investment and benefit-sharing metrics to enhance transparency and accountability.

Second, mandate sex-disaggregated data collection for all CIDP project baselines, Participatory Climate Risk Assessments (PCRAs), and Integrated Water Resources Management (IWRM) plans, enabling monitoring frameworks to detect and address gendered impact differentials that currently affect 40% of untracked initiatives. Third, strengthen land tenure reform by fast-tracking joint land titling programs and enforcing succession laws

to protect widows and female-headed households from dispossession, directly targeting the structural under-5% female land title ownership rate documented by Kariuki et al. (2019).

Fourth, scale Gender Responsive Budgeting (GRB) beyond pilot agriculture portfolios to mining, water, and environment departments, instituting mandatory 30% allocations to women-led cooperatives within tender cycles to counter elite capture of 20-30% of targeted funds. Fifth, bridge digital exclusion by partnering with Konza Technopolis to develop mobile-based resource alert systems and digital literacy programs, addressing the under-30% female usage of the county GIS portal.

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