

# Briefing

Energy; Gender

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## Policy pointers

**Governments and donors** should prioritise strengthening groups with marginalised members (eg women) and people experiencing marginalisation; this benefits both members and those trying to reach them.

**Local governments must** better streamline gender-transformative policies and approaches, taking ownership of gender and inequality in their work.

**Local governments must** adopt practical, gender-transformative tools for better socioeconomic results.

**Companies must** redesign their due diligence processes for financing solar-powered equipment that is more appropriate for women and other marginalised farmers — increasing sales and inclusivity.

## Better farmer benefits from renewable energy: improving inclusion and uptake in Kenya

Smallholder farmers' use of solar-powered water pumps and other equipment creates opportunities to increase productivity and income. However, they generally struggle to get access to financing, quality farm inputs, advisory support and connections to markets. These challenges are felt more acutely by women and other marginalised farmers who typically do not own or control resources or assets, such as land or bank accounts. This puts them at a disadvantage, for example, when qualifying for financing for solar-powered appliances. This briefing highlights opportunities for strengthening gender equality and social inclusion garnered from processes that established business cases for horticulture and poultry value chains for women and other marginalised farmers in Kenya's Kitui County — using energy as an entry point.

Women and other people experiencing overlapping marginalisation across gender, age, race, caste, language or disability are less likely to benefit from energy access because of norms and structural barriers. This inequality extends to accessing productive uses of energy (PUE), which have the potential to transform livelihoods by increasing productivity and income.

Solar-powered appliances, like water pumps, are usually more cost-effective over the product lifetime than fossil-fuel-powered generators in areas that lack reliable grid electricity. They also uncouple farmers from fossil fuel distribution shocks like high prices or fuel scarcity. However, among other challenges, the upfront costs are higher than fossil-fuel-powered equivalents, and thus out of reach for most smallholder farmers — especially women.

### The promise of energy for value chains in Kitui County, Kenya

The Kitui County Government, CAFOD, Caritas Kitui and IIED co-designed Kenya's first County

Energy Plan, using the Energy Delivery Models (EDM) design approach. The Plan was adopted by Kitui County in 2022.<sup>1</sup> That process identified impacts of energy across sectors — framing energy as an enabler of public services and household productivity. Informed by this, a UK PACT-funded project with the Kitui County Government, Caritas Kitui, Loughborough University and IIED worked with four communities to co-design business cases for irrigated horticulture and poultry value chains — using solar-powered equipment as an entry point — and develop a roadmap for commercial scale-up.<sup>2,3</sup>

Kitui County's 2019 census highlights the need to build energy access in rural areas: the county has a population of just over 1.1 million people, with 95% living in rural areas. Three-quarters of households are engaged in crop production and as many as 97% are keeping chickens. But only 17% of households have electricity access.

## *Women and other marginalised farmers face compounding factors that limit their ability to improve their livelihoods*

### Experiences in Kitui County

Our work highlighted similar intersecting challenges for farmers working in poultry and horticulture. A lack of affordable financing hinders investments that help increase productivity. Poor public infrastructure — like roads — contributes to limited access to electricity, farm inputs and extension services, as well as inadequate

access to reliable buyers. As a result, Kitui County cannot produce enough horticultural products and poultry to meet demand and relies on imports. Smallholder farmers commonly face these barriers, but women (in general) and poorer farmers (regardless of gender) face unique constraints that further limit their ability to improve their livelihoods. For example, most women farmers do not own land, and this influences the type of investments they prioritise, such as smaller, more mobile solar water pumps.

### Co-designed models for more equitable energy access

The UK-PACT funded project provided technical assistance to embed inclusive design approaches in government and stakeholder planning and ways of working. We used gender-responsive methods, like disaggregation and scheduling workshops based on women's availability (see Box 1), to select and co-design business cases that build on identified barriers preventing women and other marginalised households from increasing their income.

The project designed a set of detailed business models for accessing and benefiting from solar powered appliances in the horticultural and poultry value chains, including water projections, technology options, cashflows, and details on financing and extension support. Table 1 shows a summary of the business models around solar incubators that we co-developed with communities. The maximum projected first year's profit is a 2,552% increase over an estimated annual profit of KES 17,110 without an incubator. This highlights the huge market opportunity.

The models show the best options with available market information and can be adjusted in line with evolving market, environmental, and socio-economic conditions. For example, farmers in districts with limited rainfall might be better served by non-energy solutions like growing native grass to sell as cattle feed.<sup>7</sup>

We envisage implementation in three phases: (1) implementation and learning (2) iterative scaling

up, and (3) scaled-up. The first two phases will identify ways to make the business models more inclusive, while aggregating demand for energy products and services. Paired with subsidies and results-based financing,<sup>8</sup> this programme could be a major pull factor for bringing more companies into the County to reach the third phase.

### Financing for inclusivity

Our research shows that women typically do not meet the standard criteria of credit assessments for loans, as they do not have track records of credit and bank accounts and have limited control of assets such as land that could be used as collateral.

Many farmers experiencing marginalisation rent land and are reluctant to invest in semi-permanent and more costly irrigation infrastructure like drip irrigation, water tanks and larger pumps. Our model suggests a business opportunity for smaller, more mobile systems that can be easily moved at night for security.

Asset financing for solar water pumps and incubators using PAYGO — repayments in smaller monthly increments — offers an opportunity to reach more farmers. Lessons from the first phase would inform more inclusive finance options like seasonal payments and highlight demand to financial institutions.

### Strength in groups

Groups such as farmer networks offer marginalised individuals the opportunity to increase their capabilities and political voice, which in turn can strengthen their meaningful engagement in energy-related decision-making spaces. Women farmers cited benefits, including: joint marketing and sales, collective farming, better access to credit via group guarantees, and sharing ideas and technologies. Some also cited savings of up to 15% on buying farm inputs. For policymakers and advisors, group organisations offer efficiencies for training and monitoring.

Most farmers preferred to own the assets individually but otherwise work with their groups. The menu of options in our modelling can be applied to different contexts and further developed.

### Farmer advice services are critical

Our work highlighted a critical need for better extension support, and to embed climate-smart practices (like regenerative agriculture) to ensure farmer investments in solar water pumps leads to higher production. Women typically have lower literacy and numeracy rates, which reduces access to information. They would likely be better served through hands-on demonstrations to affect behaviour change towards climate smart practices.

Our interviews suggest that most women use small-scale poultry to meet short-term cash needs, rather than as a business opportunity. Extension services could help women recognise opportunities for maximising profits (for example, waiting to sell chickens only when fully matured).

We also found tension where public and private extension services are often blurred, with supplemental services — and sometimes mandated services — being offered at extra cost. This partially reflects severely limited resources with 3,392 farmers for every one extension officer and only 21% of extension officers being women.<sup>9</sup> Public extension services must be prioritised, but private extension support may have a role to play in the short-term.

### Climate change

Kitui County farmers are particularly vulnerable to climate change due to economic, social, infrastructure and market inequalities — which are more acute for marginalised farmers.<sup>9</sup> Horticultural farmers cited more frequent pests, infestations and heatwaves, and more irregular rainfall patterns, including shorter rains. Solar water pumps and tailored extension services in our package offer resilience support.

The poultry value chain is vulnerable to heat stresses, affecting chicken health, brooding and hatching rates, and reducing vaccine efficacy. Additionally, more frequent droughts reduce access to chicken feed and water.<sup>9</sup> Our model includes chicken housing to reduce heat stress.

### Recommendations

**Governments and donors should prioritise strengthening groups whose membership include women and other marginalised people; this benefits both members and those trying to reach them.** Organised groups are an important starting point for engagement and a critical opportunity to reach more people experiencing marginalisation. They offer efficiencies for members — indeed, joining groups can be a valuable way for women to increase their agricultural productivity.<sup>10</sup> This subsequently creates more opportunities to productively use energy for livelihood development.

Government funding to strengthen farmer and producer groups would create opportunities for policymakers, community-organisations, businesses and financial institutions to engage more widely with diverse audiences.

Groups can have impact in different ways. For example, Village Savings and Loan Associations (VSLAs) with majority women members could be supported with additional funding to ‘top up’ their own funds so higher borrowing amounts could be


### Box 1. Why we need gender-transformative approaches in energy access

Inequalities are deeply rooted in discriminatory social and economic policies, laws, institutions and practices affecting women's and other marginalised groups' access to and use of productive resources. Men and women also have different priorities in energy services. Initiatives that do not consider these risk reinforcing existing inequality.

Disaggregated data on the energy sector is limited; however, proxy indicators can be useful. For example, in Kenya, women own roughly half of small businesses, but only access 7% of available credit.<sup>4</sup> Further, women carry the double burden of domestic work and have less control over land, capital and income. This limits their time and opportunities to invest in high value PUE solutions, while men control most resources and are more able to invest.<sup>5</sup>

Project limitations required us to use a gender-responsive approach designed to increase inclusivity. But a gender-transformative approach challenges the root causes of gender inequality. To be successful, energy access initiatives must transform structural barriers and social norms that constrain women and other disadvantaged groups. Tools like the Gender Action Learning System (GALS) can help guide transformation within value chains.<sup>6</sup>

**Table 1. Example of model showing how farmers can invest in and benefit from renewable energy**

Value chain	Poultry with solar incubator 
Target market	Existing groups of women (financial groups, farming groups and so on) but individual ownership of assets
Business	50-chicken flock with different chicken types, eggs, manure for fertilizer
Technical specs example	Three incubators, each with: 32-egg capacity, automatic turning, 43W panel, battery
Financing options	<ul style="list-style-type: none"> <li>Farmer savings, soft loans from friends or family</li> <li>PAYGO monthly payments for asset</li> <li>Loan from micro-finance institute for inputs</li> <li>Loan from SACCOs with revolving fund for inputs</li> </ul>
Business inputs	Chickens, chicken feed, medicine, extension services, labour
Intervention options	<ul style="list-style-type: none"> <li>Asset or farm input subsidy from government or donor</li> <li>Government due diligence on agro-dealers</li> <li>Extension officer custom training to groups of farmers, with gender-transformative approach</li> </ul>
Projected profit in first year	KES 147,746 to KES 295, 492
Projected break-even month	Month 3

offered to members, effectively establishing a formal revolving fund.<sup>11</sup>

**Local governments must better streamline gender-transformative policies and approaches, taking ownership of gender and inequality in their work.** The Kenyan Government has numerous structures and policies supporting gender and development,<sup>12</sup> but these require enhanced implementation and better integration with local government departments.

The Ministry of Gender, Culture and Sports actively contributed to this project, but collaboration with other sectors must be strengthened to ensure effective gender mainstreaming.

Nominating 'gender and equality champions' across departments can increase ownership. This project provided training on gender and inequality to county staff; participants reported a new-found understanding and enthusiasm for incorporating these approaches and tools into their energy and livelihoods work — a promising outcome.

**Local governments must adopt practical, gender-transformative tools for better socioeconomic results.** Besides the moral imperative of gender equality, there is evidence that empowering women increases agricultural yields for both female and male managed farms — a rare win-win scenario.<sup>10</sup> But practical steps are needed.

Few Kitui County extension officers or farmers could articulate the difference between experiences and challenges faced by men and women. This highlights a need to engage with extension officers and farmers to ensure inequalities are recognised and addressed, and gender-transformative approaches are embedded into extension services curricula and training.

Government and partners should use tools such as gender and equality targets, budgeting, analyses and monitoring to support implementation and iteration. A great start is disaggregated data, as used by Kitui County.<sup>13</sup> Additional information characteristics such as disability and wealth status would allow projects to iterate and address varying constraints experienced by more people. Other tools, such as EDM, can support the co-design of more holistic and inclusive solutions.

**Companies must redesign their due diligence processes for financing solar-powered**

**equipment to be more appropriate for women and other marginalised farmers — increasing sales and inclusivity.** Asset-based financing allows poorer customers to benefit from owning solar-powered products. But many offerings try to reduce perceived lending risk via overly restrictive due diligence processes. For example, solar water pump distributor Davis and Shirliff partnered with the National Bank of Kenya to offer financing at 13% interest.<sup>14</sup> But this programme requires customers to already have accounts with the bank, which excludes most rural areas with no formal banking infrastructure and, particularly, women, who are less likely to have bank accounts.

IWMI research suggests that financing criteria should consider non-farm income-generating activities, livelihood diversification, group membership and social networks to make asset-based financing more accessible.<sup>15</sup> Donor and government guarantees could underwrite pilots.

Evidence shows that some women farmers are reluctant to invest in solar water pumps unless they can secure financing for other crucial farm inputs like high-quality seeds and farm labour.<sup>16</sup> Financing packages should address the different priorities and risk tolerance of women and other poor and/or marginalised farmers.

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## Knowledge Products

The International Institute for Environment and Development (IIED) promotes sustainable development, linking local priorities to global challenges.

The Loughborough Centre for Sustainable Transitions: Energy, Environment and Resilience (STEER) is a leading research centre whose mission is to accelerate the transition to inclusive, sustainable and resilient energy systems through innovative research, analysis and capacity building.

Founded in 1974, Caritas Kitui is the Development Department of the Catholic Diocese of Kitui. Its mission is to enhance integral human development through partnerships and innovations to achieve a sustainable community.

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## Notes

- <sup>1</sup> Garside, B and Perera, N (2021) Energy services for local development: integrated and inclusive planning for county governments in Kenya. IIED, London. [pubs.iied.org/16051iied](https://pubs.iied.org/16051iied) / <sup>2</sup> IIED, Energy enabling green development and recovery in Kitui County, Kenya. [www.iied.org/energy-enabling-green-development-recovery-kitui-county-kenya](https://www.iied.org/energy-enabling-green-development-recovery-kitui-county-kenya) / <sup>3</sup> Garside, B and Wykes, S (2017) Planning pro-poor energy services for maximum impact: the Energy Delivery Model Toolkit (Indonesia). IIED, London. [pubs.iied.org/16638iied](https://pubs.iied.org/16638iied) / <sup>4</sup> Energia (2020) Gender and energy country brief: Kenya. / <sup>5</sup> Pueyo, A, Maestre, M, Carreras, M, Bawakyllenuo, S and Ngoo, G (2018) Unlocking the Benefits of Productive Uses of Energy for Women in Ghana, Tanzania and Myanmar. Research report RA6, Energia. / <sup>6</sup> Reemer, T and Makanza, M (2014) Gender Action Learning System: Practical guide for transforming gender and unequal power relations in value chains. Oxfam Novib, The Hague, The Netherlands. / <sup>7</sup> ILRI Communications (24 February 2018) Cash Crop: Women Farmers in Kenya Beat Drought with Native Grass. [www.ilri.org/news/cash-crop-women-farmers-kenya-beat-drought-native-grass](https://www.ilri.org/news/cash-crop-women-farmers-kenya-beat-drought-native-grass) / <sup>8</sup> Lighting Global (2021) Solar irrigation system end-user subsidy reference guidelines. Lighting Global, IKEA Foundation, ESMAP, Dalberg Advisors. [www.lightingglobal.org/resource/solar-irrigation-system-end-user-subsidy-reference-guidelines](https://www.lightingglobal.org/resource/solar-irrigation-system-end-user-subsidy-reference-guidelines) / <sup>9</sup> Ministry of Agriculture, Livestock, Fisheries and Co-operatives (2021) Kenya County Climate Risk Profile: Kitui County, Nairobi (Kenya). / <sup>10</sup> Diro, G, Seymour, G, Kassie, M, Muricho, G and Muriithi, B (2018) Women's empowerment in agriculture and agricultural productivity: Evidence from rural maize farmer households in western Kenya. *PLoS ONE* 13(5): e0197995. / <sup>11</sup> Women Connect, Accessing Finances through Village Savings and Lending Associations in Kenya. [www.womenconnect.org/web/kenya/vslas](https://www.womenconnect.org/web/kenya/vslas) / <sup>12</sup> See: 2010 Constitution; Ministry of Public Service, Youth and Gender (2019) Sessional Paper No. 02 of 2019 on National policy on gender and development, which is also aligned to the SDGs and Kenya Vision 2030. / <sup>13</sup> Ross, J (24 September 2019) In Kenya, county gender data sheets are ushering in new laws and policies. UN Women Women Count Data hub. <https://data.unwomen.org/features/kenya-county-gender-data-sheets-are-usher-ing-new-laws-and-policies> / <sup>14</sup> Davis and Shirliff, Kuza Biashara on National Bank. [www.davisandshirliff.com/nbk-partnership](https://www.davisandshirliff.com/nbk-partnership) / <sup>15</sup> Minh, TT and Lefore, N (14 June 2021) Innovating for financial inclusion: Strengthening asset-based financing for women farmers. Feed the Future Innovation Lab for Small-Scale Irrigation. <https://ilssi.tamu.edu/2021/06/14/innovating-for-financial-inclusion-strengthening-asset-based-financing-for-women-farmers/> / <sup>16</sup> Lefore, N and Thai, M (27 December 2021) Adapting Asset-Based Finance to Meet the Promise of Inclusivity. Agrilinks. [www.agrilinks.org/post/adapting-asset-based-finance-meet-promise-inclusivity](https://www.agrilinks.org/post/adapting-asset-based-finance-meet-promise-inclusivity)



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