FINAL EVALUATION OF THE WOMEN ECONOMIC EMPOWERMENT THROUGH CLIMATE-SMART AGRICULTURE (WEE-CSA) IN KENYA

Final Report

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ADP	Annual Development Plan
ADSE	Anglican Development Services Eastern
ASALs	Arid and Semi-Arid Areas
ATET	Average Treatment Effect on the Treated
BETA	Bottom-up Economic Transformation Agenda
CCA	Climate Change Adaptation
CIDP	County Integrated Development Plan
D-i-D	Difference in Difference
ETE	End Term Evaluation
FAO	Food Agriculture Organization of the United Nations
FGD	Focus Group Discussions
GBV	Gender-Based Violence
HiHEA	Hand in Hand Eastern Africa
IGA	Income Generating Activities
IP	Implementing Partner
KCEP-CRAL	Kenya Cereal Enhancement Program Climate-Resilient Agricultural Livelihoods Program
KCSAP	Kenya's climate-smart agriculture program
KII	Key Informant Interviews
KNAP	Kenya National Adaptation Plan
KOICA	Korea International Cooperation Agency
LNOB	Leave No One Behind ()
M&E	Monitoring and Evaluation
MTP	Medium-Term Plan
NARIG	National Agricultural and Rural Inclusive Growth
NCCAP	National Climate Change Action Plan
NDCs	Nationally Determined Contributions
NGAAF	National Government Affirmative Action Fund
PMP	Performance Monitoring Plan
PWDs	Persons Living with Disability
SDGs	Sustainable Development Goals
ToC	Theory of Change
ToTs	Trainers of Trainers
UN Women	United Nations Entity for Gender Equality and the Empowerment of Women
VE	Village Enterprise
VSLA	Village Savings and Loans Associations
WEE-CSA	Women Economic Empowerment through Climate-smart Agriculture
WEF-K	Women Enterprise Fund-Kenya
YEDF	Youth Enterprise Development Fund

EXECUTIVE SUMMARY

Overview of the Intervention

This report presents the output and outcome level results of the final evaluation of the Women Economic Empowerment through Climate-smart Agriculture (WEE-CSA), a four-year project funded by the Korea International Cooperation Agency (KOICA) with a budget of USD 7.2 million. The project was implemented between July 2020 and December 2023 with a no-cost extension period through June 2024 to cater for the time lost at the initiation stages due to COVID-19 disruption. The project was implemented by UN Women in collaboration with FAO in three counties namely – Kitui, Laikipia, and West Pokot.

The purpose of the WEE-CSA project was to enhance the gender-sensitive adaptive capacity of selected ASAL counties to climate change and strengthen women's capacity to meaningfully engage in climate-smart agriculture. Specifically, the project aimed at -

i. Strengthening the capacity of direct beneficiaries who are 2,400 farmers, including 20% men farmers, 80% women in each county, and their family members to build sustainable economic livelihoods from climate-smart agriculture approaches and along priority agricultural value chains, including the adoption of CSA and CCA technologies and practices.

ii. Supporting women to participate in decision-making of CSA-related policy interventions fully and equally at all levels.

iii. Strengthening the capacity of key institutions to mainstream gender in national and local adaptation plans, related policies, strategies, and systems.

The project focused on two main outcomes i) to increase gender responsiveness of climate-smart policies and regulations, and opportunities for women to financially invest in climate-resilient agriculture at the national, county, and community levels and ii) to increase production, income levels, nutrition and climate-resilient livelihoods among targeted communities.

Evaluation Purpose, objectives, and questions

The purpose of this evaluation was to measure the level of achievement of the project objectives and the impact of the WEE-CSA project on outcomes, understand the impact pathway, and draw lessons from the implementation process and the impact to inform future programming.

The specific objectives of the end-line evaluation were:

i) To collect end-line values for key project indicators as per the log frame.

ii) To determine changes in the key indicators and assess the impact of the project through econometric methods, including but not limited to the DiD.

The evaluation sought to examine the following questions aligned to the project outcomes. A detailed evaluation

i) Did the WEE-CSA increase agricultural production, income levels, nutrition status, and climate-resilient livelihoods among the targeted communities?

ii) Did WEE-CSA improve gender responsiveness in climate-smart policies and regulations to enable investments in climate-resilient agriculture at the national, county, and Community levels?

Intended audience

The results of this evaluation are of importance to several stakeholders including KOICA, the UN Women at the country, regional, and HQ level; UN FAO; and other relevant staff in UN Agencies, the county and national government departments, implementing partners- Village Enterprise, Anglican Development Services Easters (ADSE) and Hand in Hand East Africa (HiHEA) whose interests are on the impact of the project and use of the lesson in designing related or similar programs.

Evaluation Data and Methodology

The end-line evaluation collected data using a structured questionnaire on the Kobo-Collect platform from 517 randomly sampled group members who were traced from the baseline sample of 610 respondents.

The data presented a 19% attrition from the baseline sample with 492 observations matched between baseline and end-line.

Qualitative data was collected from a total of 16 key informant interviews and 7 focus group discussions. Secondary information and data were collected from a review of project documents including annual reports, the project proposal document, and published and unpublished papers and reports.

The evaluation employed a mixed methods approach. Both quantitative and qualitative techniques were employed in the evaluation of the impact. The quantitative analysis employed means and proportions and tests of mean differences between the beneficiary and comparison groups and between the baseline conducted in 2020 and end-line data collected between April and May 2024. The outputs and outcomes were evaluated by making the comparison between the beneficiary and comparison groups and between baseline in 2020 and ending in 2024 with tests of significance using the test of means to ascertain the statistical significance at three levels of confidence (90%, 95%, and 99%).

The impact was attributed using the difference in difference (DiD) estimation technique. The DiD was used to quantify the impact of the project on outcomes including area under climate-smart agricultural technologies, agricultural (crops and livestock) productivity for the value chains of interest, household income, and poverty, food security, women's economic empowerment and household resilience to climate change and food insecurity. Tests were conducted to ascertain the impact of the 19% attrition which was found to be insignificant.

Qualitative analysis focuses on thematic analysis of the key informants and focus group discussions. The thematic analysis was aligned to the log frame of project indicators to complement the quantitative analysis.

Key findings

The results in this section present the comparison of output and outcome level results between the baseline and end-line and between beneficiary and comparison groups and associated test of mean differences. Detailed information on comparisons across counties is presented in the text. In the last section, DiD results are presented.

1. Policy development at the County level

Conclusion: WEE-CSA improved the climate change and gender policy, the institutional and legal ecosystem in the three counties through the facilitation of the county development frameworks to align with national Climate Change Action (CCA) and Climate-smart Action (CSA) policies bringing in gender-responsive CSA policies, development of institutions and budgetary allocation that foster reduction of gender inequality and climate change adaptation. The project led to the development of several institutional policies and legal frameworks at the county level- [**Finding 1; Finding 6]**.

- ❑ The project supported the development of numerous policies and Bills as well as institutions. The policies include Laikipia- Rangeland Management policy, Climate Change Act, and Climate change adaptation plan; West Pokot – Climate Change Bill, Gender Policy, the Youth Policy draft; and Kitui - Climate Change Policy, Gender policy draft, and the climate change adaptation plan. Departmental units within counties were established as a result of the project related to Gender units and CSA units. Moreover, as a result of the project capacity development at the county level, the counties increased their budgetary allocations towards gender and climate-smart agriculture.

2. Expansion of area under Climate-smart Agriculture and increased agricultural productivity

Conclusion: through training farmer groups on gender-responsive range rehabilitation and environmental conservation, supporting the management of existing soil and water conservation structures such as water tanks and pumps, provision of extension services, market information, information on climate change and credit access coupled with the provision of small grants and drought resistant seeds and high-value vegetables resulted into increased adoption and diversification of CSAs, the project resulted in the expansion of the area under climate-smart agricultural practices and consequently improved agricultural productivity [**Finding 2**;**Error! Reference source not found.**;**Finding 5**; **Finding 12,Finding 13**, **Finding 21**].

- ❑ The average area (Ha) per household put under climate-smart technologies increased from 0.22Ha to 0.34Ha, a 51% increase, for the beneficiaries between 2020 and 2024 while it decreased for the comparison group from 0.17Ha to 0.15Ha, a 9% decline in area. The total area under CSA

increased by 26%, from 88 Ha at baseline to 111 Ha at the end-line reflecting the increasing adoption of climate-smart agriculture especially those that require land to be implemented. The expansion of area under CSA was driven by an increase in the proportion of farmers using CSA and an increase in the number of technologies and practices from an average of 6 to 9 per farmer. As a consequence, agricultural productivity improved. Over the four years of implementation of WEE-CSA, beans productivity improved from 0.2 Tons/Ha to 0.4 Tons/Ha, green grams productivity from 0.3 Tons/Ha to 0.4 Tons/Ha, and vegetables from 3.4 Tons/Ha to 5.8 Tons/Ha. The average number of chickens owned per household increased from 32 in 2020 to 232 in 2023 while the average number of dairy goats from an average of 3 to 10 per household, and meat goats from 11 to 18. Honey production increased from 11 Kgs/beehive/year in 2020 to 12 Kgs/beehive/year in 2023.

3. Increased household income and reduced food poverty

Conclusion: An increase in productivity enabled women to produce enough for consumption and surplus. Coupled with enhanced market access, the surplus was sold for income. An increase in productivity had two effects - one, availing food, especially at vegetables at the household level and saving the monies that would have been expended on vegetables and, two, generating income that would expand the consumption frontier of the household thus drifting them off the food poverty trap [**Finding 9**; **Error! Reference source not found.**; **Finding 13**; **Finding 14**, **Finding 17**].

- The project led to an increase in household annual income between 2020 and 2024. The annual income per household increased by 36% from KES 92,543 ($718) in 2020 to KES 131,790 ($1,014) in 2023. An estimated 62% of the beneficiaries reported a positive income increase between the baseline and end-line. The increase in annual household income was 19% for the households who were not benefiting from the project. For the WEE-CSA beneficiaries, an estimated 43% of the household total annual income in 2023 was contributed by the value chains supported by WEE-CSA while for those not benefiting, the value chains contributed 31% of the household total income in 2023.
- A higher increase in annual household income was realized in households with disabled members where income increased by 52% (KES 90,038 ($692) to KES 130,447 ($ 1,022) compared to households without disabled members whose incomes increased by 33% (KES 93,029 ($716) to KES 131,598 ($1,012)). The change in annual household income was higher. The proportion of beneficiaries with expenditures above the poverty line (KES 3,252 ($0.83)) increased from 7% in 2022 to 11% in 2024.

Persons Living with Disabilities (PLWDs) gained from CSA adoption; Gains are higher for PLWDs than non-PLWDs in some of the cases. For instance, PLWDs were found to have higher diversification in CSA technologies, realized a higher gain in income and the decline in poverty was also higher compared to non-PLWDs, all driven by the adoption of CSA **[**The decline in proportion of those utilizing CSA in the comparison group proved that communities need support to continue using the technologies. Most probably, support in market linkages associated with the particular technology. As such, perhaps WEE-CSA interventions propped the beneficiary group to continue making use of the technologies compared to the unsupported comparison group. Although the survey did not establish the reason behind the high adoption at the baseline, the high rates can be attributed to perhaps earlier projects or the natural drive for farmers in the ASALs to practice climate-smart technologies.

- **Finding 3; Finding 15;Finding 16]**
- The project enhanced the food security of the households. It led to a shift from severe levels of food insecurity experience to mild levels of food insecurity experience. The proportion of households experiencing both severe and moderate diseases declined from 83% to 65%, the severe category declined from 66% to 42%. The improvement in food security experience was reflected in the increase in the proportion of households with moderate experience from 17% to 23% and the increase in the proportion of those with mild experience from 18% to 35%. The decline in the proportion of households experiencing food insecurity was faster in those households without disability compared to those with members with disability. However, the proportion of decline was important in the two categories. Moreover, in addition to the reduction in food insecurity experience, the months in which households faced food gaps declined from an average of 5 months in 2020 to

2 months in 2024 within the year for the project beneficiaries while it declined from 4 months in 2020 to 3 months in 2024 for the comparison group. [**Finding 17**].

4. Economic empowerment of women by enhancing women's leadership skills, participation in decision-making processes, and in Climate change Action

Conclusion: By facilitating media advocacy campaigns on the value addition of women in CSA, training farmers on leadership skills and the benefits that come with participation in gender-responsive CSA and CCA policy formulation, implementation, and monitoring, the project empowered women economically leading to gender transformation in the communities that participated. [**Finding 8**; **Finding 19**].

- Women's economic empowerment was driven from several fronts. The proportion of households making decisions jointly or wives participating in the decision-making process increased from 64% to 71% throughout project implementation. The proportion of women practicing CSA doubled from 8% (n=288) to 16% (n=288) with the proportion of women investing in CSA increasing from 14% (n=288) to 20% (n=287) over the implementation period. Similarly, the proportion of women participating in Climate Change Action (CCA) also more than doubled from 11% (n=162) to 28% (n=219) in 2024. Moreover, those engaged in agro-enterprises also increased from 45% (n=288) to 59% (n=287) in 2024.
- These factors contributed to the strengthening of women's economic empowerment with the index of women's empowerment increasing from 0.12 to 0.19 units (36% n=326) for the project beneficiaries. The increase was higher compared to the increase realized by the comparison group which increased from 0.09 to 0.11 (19% n=166) between 2020 and 2024.
- Capacity building on Village Savings and Loans Associations (VSLAs) enabled women to save and loan themselves money within the groups. This availed easy-to-access informal credit services that were less restrictive enabling investment in climate-smart agriculture practices [**Finding 5**; **Finding 6**; **Finding 7**].
- The gender advocacy enlightened women through financial literacy and active participation in supporting household economic activities. Coupled with the climate-smart technology- kitchen gardens, women participated in production for household consumption and made income from the surplus vegetables. The financial literacy transformed the traditional merry-go-rounds into table banking, or Village Savings and Loans Associations (VSLAs), granting women informal financial access which helped them borrow to invest in CSA and meet short-term household expenditures. This contribution to the household expenditure basket proved convincing and granted them some more space towards gender equity. [**Finding 5**; **Finding 6**; **Finding 9**; **Error! Reference source not found.**].

5. Gender transformation –

Conclusion: Gender-based violence declined but more progress is still hampered by inaccessibility to financial services, illiteracy, cultural norms, and attitudes [**Finding 5**; **Finding 6**; **Finding 7**, **Finding 9**, **Error! Reference source not found.**;**Finding 11**; **Finding 19**; **Finding 22**]

- The proportion of people reached with gender mainstreaming messages increased from 27% (n=326) in the baseline to 57% (n=326) by the closure of the project. The number of women in community groups undertaking aggregation and marketing increased from 35% (n=288) to 56% (n=287). Household decisions on spending income generated from the proceeds of the targeted value chains shifted towards a joint decision-making process between the husband and wife.
- Enhanced capacity, confidence, and courage to participate actively in discussions regarding development – across the three counties, 12 out of 16 key informants and all the participants in the 7 FGDs revealed that after capacity building from the WEE-CSA project, women were actively participating in development forums- such as county public participation and voicing their views on development projects.
- Shift in gender roles with women participating in roles earlier regarded as masculine responsibilities – the WEE-CSA project demonstrated that through the kitchen gardens and engagement in other income-generating activities, women could effectively provide and support men in meeting household food needs and supplement household incomes.

- The shift in ownership of assets – key informants 12 out of 16 and participants in 2 of the 7 focus group discussions indicated that women-owned at least a goat and could access land.
- Enhanced women's access to financial services that enabled investment in CSA - The project enhanced the capacity of women on financial access increasing the proportion of women who had financial literacy from 58% to 64% between the baseline and end-line. Although this did not lead to a huge increase in the women participating in CSA, financial literacy transformed the traditional merry-go-rounds into table banking, or Village Savings and Loans Associations (VSLAs), granting women informal financial access which helped them borrow to invest in CSA and meet short-tern household expenditures and investment in climate-smart agriculture practices such as kitchen gardens and zai pits. Women's contribution to the household expenditure basket proved convincing and granted them some more space towards gender equity.
- Reduced gender-based violence - Gender-based violence declined as women became more aware of their role in the family through gender mainstreaming messages, capacity building through leadership skills, and empowerment through participation in income-generating opportunities. However, progress toward reducing gender inequality gaps is hampered by inaccessibility to financial services, illiteracy, cultural norms, and attitudes.

Quantified Impact of WEE-CSA

Conclusion - The changes in the adoption of climate-smart technologies, agricultural productivity, household income, food security, and women empowerment are attributed to the project. However, the gains made by the project were at risk of being eroded in the event of a climate or economic shock because of the low resilience capacity of the households [**Finding 18**, **Finding 23**].

The quantified impact of WEE-CSA is significant in all the outcomes except for building household resilience. Notably,

- Nine percent (9%) expansion of the average area of land under climate-smart technologies is attributed to WEE-CSA. This was driven by the promotion of the CSA technologies by the WEE-CSA. Zai Pits, terraces, and vertical gardens were among the widely adopted technologies that pushed outwards the area under CSA.
- A five percent (5%) increase in the productivity of potatoes, a 57% increase in poultry numbers, a 48% increase in eggs per year, a 14% increase in honey productivity, and a 38% increase in household income between the baseline and end-line can be attributed to the project. This income emanates from the surplus of produce sold from increased production from the focus value chains.
- The women empowerment index increased by 0.053 units due to the interventions made by the project thus contributing towards strengthening women's economic empowerment. This positive effect is associated with increased participation of women in the targeted value chains and income that accrued from the value chains.
- The project significantly reduced the proportion of households experiencing severe food insecurity by 26% after implementation. The proportion experiencing mild food insecurity increased significantly by 22%.
- Had a weak influence on the resilience of the households to climate change and food insecurity - although the project strengthened women economically, it did not build the resilience of the household significantly and as such, gains were made on income and food security as well on gender were at risk of being eroded in the event of exogenous shocks (climate, economic/market shocks). This was due to delays in the delivery of assets stemming from cumbersome procurement and in the facilitation of Trainers of Trainers (ToTs) who are the frontline implementers The resilience index declined from 34% to 31% for the beneficiaries and 40% to 39% for the comparison group. The decline was slightly higher for the families with disabled members (from 33% to 29%) compared to the families without disabled members (34% to 31%).

Impact Pathway

The pathways through which WEE-CSA impacts women's economic empowerment were mapped through crop and livestock productivity and household income.

- ❑ Adoption of CSA technologies and practices is influenced by access to climate change information and extension services. It is also influenced by the size of land owned as some of the technologies such as Zai pits, farm ponds, and terraces depend on the size of the land. [**Finding 21**]
- ❑ The adoption of CSA increased crops and livestock productivity. The adoption of CSA led to an increase in household income.
- ❑ Increased household income led to empowered women economically. A 1% increase in household income results in an increase of 0.41 units of the women's economic empowerment index while the increase of one unit of the women's empowerment index shortens the number of months of food shortages by 1.6 months.

Key Lessons Learnt

Several lessons were drawn from the implementation and impact of the WEE-CSA project –

1. Interventions to support policy, legal, and institutional development influence budgetary allocation at the county level. This means that an up-to-date policy and institutional framework offers an opportunity to guide in allocation of finances to mitigate climate change and gender disparities **[Finding 1].**
2. Climate-smart agriculture technologies confer benefits to women - Climate-smart agriculture has a positive influence on agricultural productivity, and household income, which in turn positively empowers women economically and positively influences household food security. These gains are made by those who invest in the CSA technologies [Finding 2;The decline in proportion of those utilizing CSA in the comparison group proved that communities need support to continue using the technologies. Most probably, support in market linkages associated with the particular technology. As such, perhaps WEE-CSA interventions propped the beneficiary group to continue making use of the technologies compared to the unsupported comparison group. Although the survey did not establish the reason behind the high adoption at the baseline, the high rates can be attributed to perhaps earlier projects or the natural drive for farmers in the ASALs to practice climate-smart technologies.
3. **Finding 3**;Finding 7;Finding 20].
4. Women are important actors in addressing climate change and food insecurity by adopting mitigation technologies and practices. If women's leadership skills are developed, and empowered through extension, credit access, climate change information, market information, and access to land, they can play a greater role in curbing the vagaries of climate change. Moreover, empowering women has positive effects on the food security of households with months of food insecurity declining. [**Error! Reference source not found.**;**Finding 5**; **Finding 6**;**Finding 7**, **Finding 8**, **Finding 9**;**Finding 11Finding 13**;**Finding 14**; **Finding 19**;**Finding 17**].
5. Inclusivity leads to positive gains in agricultural development with PLWDs effectively contributing towards and benefiting from climate change mitigation and gaining from economic empowerment justifying inclusivity in development projects. For instance, the PLWDs were found to have higher diversification in CSA technologies, realized a higher gain in income and the decline in poverty was also higher compared to non-PLWDs [**The decline** in proportion of those utilizing CSA in the comparison group proved that communities need support to continue using the technologies. Most probably, support in market linkages associated with the particular technology. As such, perhaps WEE-CSA interventions propped the beneficiary group to continue making use of the technologies compared to the unsupported comparison group. Although the survey did not establish the reason behind the high adoption at the baseline, the high rates can be attributed to perhaps earlier projects or the natural drive for farmers in the ASALs to practice climate-smart technologies.
6. **Finding 3**;**Finding 15**;**Finding 16**].
7. Climate-smart Agriculture programs may not necessarily result in building household resilience especially if asset-related interventions are delayed and do not auger or integrate well with pre-existing economic activities. This implies that programmatic interventions that seek to build

community assets should be matched with the entrepreneurial skills of the groups if they are to yield returns in a shorter time. Else, they remain unemployed for the intended purposes for a long or never get utilized [**Finding 18**,**Finding 23**].

8. Prohibitive gender norms and cultural practices are hard to die and require persistent creation of awareness and gender-responsive capacity building. Notably, there is still a long way to empowering women. Cultural norms and attitudes, poor financial access for women, and illiteracy that prohibit women's economic empowerment are still persistent [**Finding 22**].

Recommendations

The following recommendations were synthesized from the descriptive and quantitative analysis results –

1. Support counties to develop policy, legal, and institutional frameworks to foster gender equality and climate change mitigation in the allocation of resources by county governments towards climate-smart agriculture [Finding 1].
2. Support extension services, climate change information, market information, and market linkages supply and credit services to women to promote increased adoption of climate-smart agriculture technologies and practices [Finding 9;Finding 19;Finding 21].
3. Build the capacity of women's leadership skills to enable them to effectively participate in economic decisions at household and government levels [Finding 8].
4. Build the absorptive and adaptive capacity through widening the asset base of communities and households to strengthen their resilience to climate and even economic shocks and prevent erosion of gains made [Finding 18].
5. Enhance the participation of PLWD in line with the Leave No One Behind (LNOB) principle through budgeting and providing for their special needs such as transport, assistive devices, and helpers. [The decline in proportion of those utilizing CSA in the comparison group proved that communities need support to continue using the technologies. Most probably, support in market linkages associated with the particular technology. As such, perhaps WEE-CSA interventions propped the beneficiary group to continue making use of the technologies compared to the unsupported comparison group. Although the survey did not establish the reason behind the high adoption at the baseline, the high rates can be attributed to perhaps earlier projects or the natural drive for farmers in the ASALs to practice climate-smart technologies.
6. **Finding 3**;Finding 15; Finding 16]
7. Increase investments in climate-smart agriculture technologies for expansive and intensive gains on agricultural productivity, income, reduced poverty, and food insecurity [Finding 20]
8. Invest in changing attitudes and practices as well as breaking down harmful practices that fuel gender inequality and GBV to enable accelerated participation of women in economic activities- [Finding 11;Finding 22
9. Develop an effective knowledge management system and function for each project to manage data and information amenable to monitoring and evaluation of the project. [Finding 24].
10. After the project completion, plan to undertake a sustainability evaluation to deeply understand what happens when a project comes to a closure [Finding 25
11. Ensure that for every project, a review of procurement requirements is done to clearly anticipate and plan for the timely delivery of project items and elements that may take time to obtain for example assets that are to be transferred to the community for development purposes. [Finding 13,Finding 23].

SECTION 1. INTRODUCTION

1.1. PURPOSE OF THE REPORT

This report presents the findings of the End of Term Evaluation (ETE) for the Women's Economic Empowerment through Climate-smart Agriculture (WEE-CSA) project in Kenya. The four-year project was funded by the Korea International Cooperation Agency (KOICA) with a budget of USD 7.2 million. The project was implemented between July 2020 and December 2023 with a no-cost extension period through June 2024 to cater for the time lost at the initiation stages due to COVID-19 disruption. The project aimed to empower women through climate-smart agriculture (CSA), aligning with both global and national strategies that focus on reducing gender gaps and enhancing sustainable development.

The project was implemented by UN Women in collaboration with FAO in three arid and semi-arid counties namely, Laikipia, Kitui, and West Pokot. The criteria for the selection of these counties included vulnerability to climate change; agricultural productivity; poverty levels; social norms and beliefs that hinder women's equality; participation in the economic, social, political, and decision-making spheres (Gender Inequality Index); and engagement of other stakeholders to avoid duplication. These counties are characterized by low adoption of CSA practices and technologies. In Kitui, a study by Muriithi et. al., (2001) showed that adoption levels of integrated farming systems, intercropping, crop rotation, and agroforestry were 47% and were influenced by education and sex. In Laikipia, most adopted technologies and practices included crop diversification (87%), mixed farming (crop farming and livestock keeping) (83%), use of pesticides and fungicides (80%), and crop rotation (74%) (Kenduiwa et al., 2024). In West Pokot, despite the emerging appreciation of CSA, adoption is limited because of communication barriers that affect the uptake of climate-smart agriculture among agro-pastoralists including language barriers, poor communication techniques, inadequate information centers, limited numbers of extension officers in the field, and inadequate information infrastructures to facilitate communication (Maritim et al., 2022).

The purpose of this evaluation was to measure the level of achievement of the project objectives and the impact of the WEE-CSA project on outcomes, understand the impact pathway, and draw lessons from the implementation process and the impact to inform future programming. The results, outcomes, and outputs of the project are clearly framed out of this ToC and make it easier to follow the envisaged results chain following the indicators under the outcomes and outputs. The project's ToC was coherent and well-structured and clearly articulated how change would be achieved through the results chain of the project.

The report provides details of the evaluation findings drawing from field consultations, secondary data, and results of validation processes with the Evaluation Reference Group (ERG). Drawing from these findings, the report outlines recommendations and lessons learned for similar upcoming projects in Kenya and beyond.

1.2. BACKGROUND AND CONTEXT

Kenya has made gradual but positive progress over the past decade in efforts to reduce the gender gap and empower women. The gender gap in Kenya narrowed from a 0.69 index in 2017 to 0.73 in 2022 and slightly declined to 0.71[1]. in 2023. Key initiatives that align to Sustainable Development Goal 5 (SDG 5), such as Free Primary and Secondary Education, the Women Enterprise Fund-Kenya (WEF-K), the Youth Enterprise Development Fund (YEDF), and the National Government Affirmative Action Fund (NGAAF) have contributed to advancing women's economic empowerment. Despite the sustained focus on reducing the gender gap, incidences of drought, erratic rainfall patterns, and floods slow down economic growth by causing crop and livestock losses, population migration and displace men with women disproportionately affected especially in the Aris and Semi-Arid Lands (ASALs) in Kenya.

The threats posed by climate change in ASAL areas can be reduced by increasing adaptive capacity, resilience, and resource use efficiency (Lipper et al 2014) but the adoption of climate adaptation strategies has remained low (Kalele et al., 2021). Since 2010 Climate-smart Agriculture (CSA) has increasingly

[1] https://www.statista.com/statistics/1220570/gender-gap-index-in-kenya/

become an approach to mitigate climate change risks and has been regarded as a transformative approach to agricultural production systems leading to improved productivity (Lipper et al., 2014), that offers an opportunity to address food insecurity and nutrition, resilience to climate change and limited greenhouse gas emissions (Chakraborty et al 2023). In 2013, climate and disaster resilient development was recognized as essential if the elimination of extreme poverty and achievement of shared prosperity was to be achieved by 2030 (World Bank 2013). As such, the adoption of climate-smart technologies and practices has far-reaching positive effects on agricultural productivity, household income, food security, and resilience to exogenous shocks.

Bacha et al., 2010; Were et al., 2016; Ogada et al., 2020; FAO, 2021; Ogola and Ouko, 2021; Ahmed et al., 2023; Geffersa, 2023; Tilahun et al.,2023; Hongyun et al., 2024 and Hussein and Toru., 2024 demonstrate that CSA practices including climate-resilient crop varieties, conservation agriculture, improved livestock management, and water management systems, help farmers adapt to changing conditions, boosting productivity and income. Adoption of stress-tolerant varieties (such as bean, pigeon pea, cowpea, maize, and sorghum) and adoption of resilient livestock breeds (including the Red Maasai sheep and Galla goats) have been found to positively affect dietary diversity and reduction of food insufficiency in households (Radeny et al, 2022). Adoption of CSA technologies contributes positively towards building the resilience of small-holder farmers by enhancing absorptive capacity, adaptive capacity, and transformative capacity (OECD, 2014; Oxfam, 2017, 2018; Rivera and Ubels, (2022); Teklu et al., (2023); World Bank, (2017, 2018), and Negera et al 2023).

Despite the importance of CSA, the adoption is driven by several socioeconomic factors including the education level of the farmer (Mwungu et al., 2018, Andati et al 2022; Diro et al, 2022; Ndung'u et al., 2023; Geda et al 2024; Mwikamba et al., 2024) and access to extension services (Arslan et al., 2014, Andati et al 2022; Ndung'u et al., 2023). Extension service agents are the frontline technical experts and farmers develop trust in them facilitating an easy connection for training. Credit access determines the adoption of CSA technologies (Mulwa et al., 2017; Ndung'u et al., 2023; Geda et al., 2024); access to credit (Andati et al., 2022; Gikonyo et al., 2022; Teklu et al., 2023, van Asseldonk, et al., 2024 and Geda et al., (2024). Access to credit, savings, and income stimulated the adoption of CSA technologies such as livestock breeds, short-term investments such as fertilizers and seeds, and long-term investments in fixed inputs such as equipment which pose a significant barrier to adoption.

High rates of CSA adoption have been realized in areas with access to information on the technology and information on climate change as this enables farmers to identify the context of the technology application (Mulwa et al., 2017; Adeola et al., 2024) and distance to market where produce can be sold (Andati et al., 2022; Ndung'u et al., 2023; and Geda et al., 2024). Land-intensive technologies such as terraces, and land ripping are adopted in areas where land is available and ownership is conferred to the farmer for investment (Andati et al 2022; Ndung'u et al., 2023).

Adoption of climate-smart agriculture technologies is also influenced the gender (Andati et al., 2022; Mwikamba et al., 2024). Although studies differ in the impact of gender on the adoption of CSA (Musafiri et al., 2022- women-headed households have higher adoption of CSA while Negera et al., 2022 obtained contrary findings in Ethiopia), it is evident that intra-gender aspects are important in agricultural productivity. Intra-gender aspects that drive the adoption of technologies include the level of education and source of income (Antwi et al., 2023). Women with stable sources of income can easily meet the initial costs of technology investments. Adoption of technologies is higher among the less educated farmers because they are mainly dependent on agriculture (crops and livestock production) unlike the learned who could have alternative livelihoods.

Women, young boys, and girls also experience climate change differently compared to men. Women and girls are compared to men, by their position and responsibilities assigned through patriarchal norms. For instance, the family patriarchal structure charges women and girls with livelihood production, securing water, food, and fuel for cooking while at the same time taking care of the young and elderly as well as the disabled), experience negative climate change more disproportionately (UNDP 2020). Women take up the bulk of agricultural production and contribute to consumption at the household level but earn a small fraction of the proceeds from their work (GoK 2017).

Gender disparities are evident in many dimensions. For instance, wage gaps are evident with women earning almost 32% lower than men (World Economic Forum 2015; Omayo 2021) in the formal sectors.

Such disparities contribute to the bulging poverty in women-headed households compared to male-headed households. Moreover, women compared to men, have less education, poor access to financial services and information, and are not involved in political, community and household decision-making that influence their access, control, and utilization of resources all of which widen the gender inequality gap and render them more vulnerable to climate change. Negative climate change effects impair women's economic empowerment and thus perpetuate gender disparities and also impair the path toward Kenya's economic development.

Evidence shows that gender gaps in climate-smart agriculture exist driven by policy legislation, financial resources, social and cultural taboos, and technical determinants such as climate information access (Boudalia et al 2024). Yet, development goals can be effectively achieved if CSA design and implementation take cognizance of gender and social inequalities with increased adoption of CSA by women incentivized by focusing on issues of power, asset and resource allocation, leadership, agency, and empowerment (Chakraborty et al 2023).

1.1. PROJECT DESCRIPTION

1.3.1 OVERVIEW

The Women Economic Empowerment through Climate-smart Agriculture (WEE-CSA) project, a four-year initiative implemented by UN Women and FAO, was designed to address gender disparities and promote women's economic empowerment in three Arid and Semi-Arid (ASALs) counties in Kenya: Kitui, Laikipia, and West Pokot. The project was funded funding from Korea International Cooperation Agency (KOICA) and implemented between July 2020 and December 2023 but extended at no cost to June 2024. The Project was funded US$ 6,731,579 over 4 years starting July 2020 and December 2023. Both UN Women and FAO contributed USD 1,361,579 and USD 500,000 respectively with the amount funded by KOICA being USD 4,870,000. The project aimed to empower women through climate-smart agriculture (CSA), aligning with both global and national strategies that focus on reducing gender gaps and enhancing sustainable development.

The project was well integrated into Kenya's development framework, notably the Vision 2030, which recognizes agriculture as a key driver of economic growth, alongside its climate change-related policies, such as the Kenya National Adaptation Plan (NAP) 2015-2030, the Climate Change Act 2016, and the National Climate Change Action Plan (NCCAP) 2018-2022. These policies emphasize the importance of addressing climate change while promoting food security and nutrition, which the WEE-CSA project sought to advance through CSA practices.

The project was implemented in three arid and semi-arid counties namely, Laikipia, Kitui, and West-Pokot. The criteria for the selection of these counties included vulnerability to climate change; agricultural productivity; poverty levels; social norms and beliefs that hinder women's equality; participation in the economic, social, political, and decision-making spheres (Gender Inequality Index); and engagement of other stakeholders to avoid duplication. These counties are characterized by low adoption of CSA practices and technologies. In Kitui, a study by Muriithi et. al., (2001) showed that adoption levels of integrated farming systems, intercropping, crop rotation, and agroforestry were 47% and were influenced by education and sex. In Laikipia, most adopted technologies and practices included crop diversification (87%), mixed farming (crop farming and livestock keeping) (83%), use of pesticides and fungicides (80%), and crop rotation (74%) (Kenduiwa et al., 2024). In West Pokot, despite the emerging appreciation of CSA, adoption is limited because of communication barriers that affect the uptake of climate-smart agriculture among agro-pastoralists including language barriers, poor communication techniques, inadequate information centers, limited numbers of extension officers in the field, and inadequate information infrastructures to facilitate communication (Maritim et al., 2022).

While the rates of adoption depend on the type of technology but are generally low, these counties also are characterized by contextual factors that may influence the adoption of CSA. Besides demographic characteristics, experiences of climate change shocks, livelihoods, and policy and governance may have a bearing on the adoption of CSA. In Laikipia, challenges that constrain agricultural productivity are related to climate change risks including uncertainties in the onset of the rain seasons, water stress, and drought (MoALF, 2017). These challenges may spur accelerated adoption of CSA technologies and practices.

However, poor policies that confer overlapping mandates to county sectors, and poor coordination between different departments and institutions in the county may undermine CSA technology adoption and continue to deny the communities the opportunity to build on their adaptation capacity. In Kitui County, agriculture is the main economic activity contributing to food security and 87% of annual household income. However, agricultural productivity is constrained by among others, weather variability as well as pests and diseases (MoALF, 2021). The county enjoys the support of numerous development partners interested in addressing climate change. In addition, the county has adopted several national policies aimed at adapting to climate change by facilitating farmer access to information enabling them to make viable economic decisions and adapt well to climate change. These policies have a likelihood of driving the adoption of CSA. In West Pokot, crops and livestock are the main source of livelihoods with livestock contributing more income compared to crops. Climate change experiences have mainly been flooding which has caused erosion and thus creating interest in CSA technologies that may help mitigate soil erosion and flooding. In addition, the policy environment offers an opportunity for the adoption of CSA with the county in the process of developing policies that will help in the harmonization, coordination, and funding of programs targeting the agricultural sector with a focus on addressing climate change adaptation and preparedness (MoALF. 2016).

In the selected counties, the project targeted low-income wards that lacked prior CSA initiatives. The selection process involved collaboration between UN-Women, FAO, and county agriculture officers. The project covered policy, institutional and behavior change, incentives for investments in CSA, and empowering women's voices in CSA. Specifically, the project's focus was on capacity building including the development of policies and training for both staff and local groups on CSA practices, agri-business, financial literacy, livestock management, gender advocacy, group dynamics, and nutrition-sensitive agriculture. Additionally, the project included the transfer of assets** to support the implementation of these practices. Overall, the WEE-CSA project aimed to empower women in ASAL regions by equipping them with the knowledge and resources needed to enhance their livelihoods, reduce gender inequalities, and build resilience to climate change.

- **Agri-business training:** the training exposed farmers to value chain concepts, value addition, gross margins, and the suitability of value chains to local contexts. The training also incorporated gender aspects along the value chains. The community groups were also trained in record keeping, business planning (inputs and seasonal calendar, financial planning and projections, budgeting and risk assumptions, and management in line with production, markets, and institutions. On value addition, community groups were trained on sorting, grading, packaging, labeling/branding, transporting of fresh produce, and livestock management while for marketing, groups were trained on how to aggregate and undertake common sales and bulk input purchases, online/digital marketing, farm gate sales, and collection and use of market information.

- **Financial literacy** training sought to expose farmers to expenditure tracking, raising capital (various sources of capital), savings (ways of saving money), and investments for the future.

- **Climate-smart Agriculture (CSA) -** entailed training to expose farmers to causes of climate change, and implementation of climate change practices. Among the important practices include Integrated Pest Management (IPM), the use of quality planting seeds, the use of organic manure, soil and water conservation, conservation agriculture, agro-forestry, energy saving, irrigation methods, and harnessing and use of solar energy.

- **Livestock production and range management –** the beneficiary groups were exposed to beekeeping, dairy goat, doper sheep, indigenous chicken, meat goat (Galla), and rangeland management practices. Practices trained on livestock production were feeding, watering, health management-diseases and pest management, breeding, housing, and associated business opportunities. Groups were also trained on rangeland management practices, including keeping the appropriate breed of animals (livestock), the appropriate number of animals, the correct season of range use or grazing, and the proper distribution of livestock in range areas. In addition, groups were trained in grazing systems and rangeland improvement practices.

- **Gender advocacy, group dynamics, and leadership -** The gender intervention in WEE-CSA entailed -gender advocacy, group dynamics, and leadership, and was directed to the county governments and associated county departments.

- **Gender advocacy** exposed the county governments to the stages of advocacy, and integration of the CSA into County Climate Change Action (CCA). The stages of gender advocacy included identification of advocacy issues, analysis of stakeholders in the advocacy, formulation of gender advocacy message and tool, identifying and choosing the advocacy message bearers, formulating the advocacy strategy, methods of delivering the advocacy message, and monitoring and evaluating the strategy. The advocacy also inducts the counties on how to integrate the Climate-smart Agriculture and County Climate Action and the importance of women participation in the advocacy process.
- **Group dynamics:** in group dynamics, the skills aimed at understanding the different types of groups, formation of groups, the rights and duties of the elected members, different behaviors of group members and how they affect the group activities, techniques of resolving conflicts, and development for group constitution.

- **Leadership**: the training on leadership aimed at understanding leadership skills and their importance, understanding the abilities of team members, motivating them to work together for shared goals, and enlightening women on the need for participation in decision-making platforms.
- **Nutrition-sensitive agriculture** - Several aspects including exposure to the understanding of food groups, meal planning and preparation, value addition, food safety, sanitation and hygiene, and energy-saving techniques. In addition, groups were also trained in kitchen gardening to produce vegetables and provide household nutrition and financial status. This was targeted towards improving the nutritional status of the households.

1.3.2 PROJECT PURPOSE, OBJECTIVES, KEY RESULT AREAS AND OUTCOMES

The purpose of the WEE-CSA project was to enhance the gender-sensitive adaptive capacity of selected ASAL counties to climate change and strengthen women's capacity to meaningfully engage in climate-smart agriculture. Specifically, the project aimed at -

i. Strengthening the capacity of direct beneficiaries who are 2,400 farmers, including 20% men farmers, 80% women in each county, and their family members to build sustainable economic livelihoods from climate-smart agriculture approaches and along priority agricultural value chains, including the adoption of CSA and CCA technologies and practices.

ii. Supporting women to participate in decision-making of CSA-related policy interventions fully and equally at all levels.

iii. Strengthening the capacity of key institutions to mainstream gender in national and local adaptation plans, related policies, strategies and systems.

The project had two main outcomes -

Outcome 1: ***To increase inclusion of gender-responsiveness of climate-smart policies and regulations and opportunities for women to financially invest in climate-resilient agriculture at national, county, and community levels***. This entailed supporting the county, and sub-county coordination structures at the county and sub-county levels such as the county steering groups, and ASAL stakeholder forum, among others to enhance their effectiveness in the implementation of climate resilience agriculture interventions and domestication of national policies and strategies at the county levels. The implementation focused on focus on supporting the Ministry of Environment as a key stakeholder to engender two key CSA documents: Kenya Climate-smart Agriculture Strategy and Kenya Climate-smart Agriculture Implementation Framework to ensure their gender responsiveness. The project will also address the agency and decision-making capacity of women farmers providing them with the leadership and negotiation skills to participate effectively in policy planning, implementation, and monitoring. The outputs for this outcome were i) The increased capacity of national and 3 County Governments on gender-responsive CSA and CCA policy development and implementation and ii) the capacity of Women farmers strengthened to engage in gender-responsive policy planning, implementation, and monitoring of CCA and CSA.

- **Outcome 2: To increase production, income levels, nutrition, and climate-resilient livelihoods among targeted communities.** The project aimed at enhancing the capacity of

vulnerable communities, with a special focus on women and youth, to adapt to climate change through a variety of CSA practices. The project aimed at enabling the individual farmer groups to increase their agricultural production, income generation, and household nutrition status. but also, significantly reduce county government allocation (expenditure) of its funds on seed and food subsidies during droughts, disease outbreaks, and flood crises to the communities. All these efforts will stabilize the agricultural and pastoral landscape thus enhancing the range-land and water resource conservation and management.

1.3.3 PROJECT THEORY OF CHANGE

The project was premised on the theory of change that: if (1) climate-smart agriculture and climate adaption are gender-responsive; if (2) women have access to climate-resilient livelihoods, productive assets, technologies, and skills, and this is supported by enabling social norms and practices; then (3) women and girls affected by climate change will play a leadership role and benefit from CSA and climate change adaptation (CCA) efforts; then (4) adaptive capacity to climate change will be enhanced and women's rights and needs will be at the center of climate-smart agriculture and climate adaption strategies and priorities.

1.3.4 KEY STAKEHOLDERS/PARTNERS OF THE PROJECT AND THEIR ROLES

Several stakeholders participated in the implementation of the WEE-CSA project. These either played the role of funding, coordination, and/or implementation. UN Women collaborated with three Implementing Partners (IPs), one in each county. The Implementing partners were selected based on their understanding of the context of the county particularly in gender aspects, financial management structures, and their reach across the counties. These included - - -

- **KOICA**- funded the project and provided oversight
- **UN-Women**- provided technical persons in every county to monitor and oversee the implementation of the project and coordinated the implementation. UN Women also participated in the identification of the beneficiary Wards and groups. UN-Women.
- **UN-FAO**- FAO supported the county governments to participate in the WEE-CSA while the county provided office space and other resources.
- **The Ministry of Agriculture, Livestock, Fisheries and Cooperatives, and State Department for Gender complements at National and County Level**. **County Governments** -Kitui, Laikipia, and West Pokot – the counties provided the launchpad for the project through their agriculture and livestock departments collaborating to support and coordinate extension service provision and together with the IPs identified the beneficiary Wards and groups. Groups of farmers were identified by the county extension staff in the Department of Agriculture and submitted for verification and selection by FAO and UN Women team. The county focal persons acted as the link between the project and the county government. The project was implemented through the Training of Trainers (ToTs) from the county, mainly the extension officers. In Kitui, for instance, the county seconded extension staff into the project to lead its implementation with the focal point person supporting in coordination and management of group information.
- **Anglican Development Services Eastern (ADSE)**[2] which implemented the WEE-CSA project in Kitui County focuses on transforming communities across Machakos, Kitui, Makueni, and Garissa counties through integrated development initiatives. Focused on fostering secure and sustainable livelihoods, ADSE operates across multiple thematic areas including Food Security, Water, Sanitation and Hygiene (WASH), Climate Change and Environmental Conservation, Health, Nutrition, Gender & Social Inclusion, and Institutional Capacity Development

[2] In the WEE-CSA Project, ADSE employs innovative approaches such as storytelling for change, theatre for development, Village Savings and Loans Associations (VSLAs), and community champions to effectively engage communities. These methods not only educate and empower community members but also enhance resilience and promote inclusive development. With a commitment to participatory methodologies and community-driven solutions, ADSE plays a pivotal role in addressing local challenges and promoting lasting change in the region.

- **Village Enterprises (VE)[3]-** Implemented the WEE-CSA project in West Pokot County covering Riwo, Batei, and Suam Wards in Kapenguria, Kipkomo, and Kacheliba Sub Counties, West Pokot County
- **Hand in Hand Eastern Africa (HiHEA)[4]**. Within the Women's Economic Empowerment through Climate-smart Agriculture (WEE-CSA) project, HIH EA focuses on Laikipia County, specifically in Mukogodo East, Umande, and Tigithi wards. The project engaged 988 members, predominantly women (90%), with significant youth participation (40%) and inclusion of people with disabilities (8%). Key outcomes include the development of gender-responsive climate-smart policies and enhanced capacity of both national and county governments in policy development and implementation. A detailed matrix of all the stakeholders and their roles is provided in Annex 1.

1.3.6 CHANGES TO PROJECT DESIGN AND IMPLEMENTATION

The WEE-CSA project was implemented between July 2020 and December 2023 with a no-cost extension to June 2024. The no-cost extension was necessary to deliver on some of the elements particularly the assets and machines that were delayed due to the procurement process. The project's frontline implementation was the IPs who led the project activities. Midway into the implementation, UN Women made changes to the IPs recruiting two new additional IPs to take over in Laikipia and Kitui Counties. In Laikipia County, Hand in Hand East Africa (HiHEA) and Anglican Development Services Eastern (ADSE) took over the implementation from Groots Kenya. Such a lapse also lengthened the project implementation time. The change of IPs slowed the implementation of the project in Laikipia County and Kitui County as the two IPs were being taken on board.

1.3.7 SELECTION OF BENEFICIARY AND COMPARISON GROUPS

The WEE-CSA was implemented in Kitui, Laikipia, and West Pokot Counties. In each county, three administrative wards with community groups were targeted. The sample of beneficiaries was drawn from a list of 107 groups spread across 9 administrative Wards, 3 in each county (Laikipia, Kitui, and West Pokot). These administrative wards had previously been identified by the project teams as the most deserving for this project. The selection of the Wards was not based on any random process but an exclusion criterion that was based on the non-existence of any project in the Ward that a project in the ward resembled WEE-CSA.

By design, the selection of beneficiary groups was biased toward women composition. Preference was given to groups, that had more women than men membership, or had members with disabilities or caregivers of disabled family members. As a result, and by the targeting design, the beneficiaries of the WEE-CSA project were largely the women who constitute part of the poorest groups as well as Persons Living with Disability (PLWDs) in the targeted counties. The project was designed to target groups, which constituted 80% women and 20% men.

- In Kitui County, the WEE-CSA project sites were Kauwi ward (412 beneficiaries) in Kitui West and Mutomo/Kibwea (244 beneficiaries) and Athi wards (315 beneficiaries) in Kitui South.
- In Laikipia County, three wards were targeted under the WEE-CSA project namely Tigithi (314 beneficiaries) and Umande (274 beneficiaries) wards in Laikipia East and Mukogodo East (387 beneficiaries) in Laikipia North.

[3] Village Enterprise is a nonprofit organization dedicated to reducing poverty in rural Africa through entrepreneurship and innovation. It empowers individuals in impoverished communities by providing them with the resources and skills needed to start sustainable businesses. The organization's model combines business training, seed funding, and ongoing mentoring to help participants develop income-generating activities and achieve financial independence.

[4] The HiHEA applied the following approaches –

- Regular Monitoring and iteration by field officers (grassroots engagement).
- Incremental and interlinked learning using WEE-CSA modules
- Use of gamified training that simulates practical experience leading to retention.
- Governance: Asset utilization and ownership agreements.
- Transition of participants from local practices to profitable business practices, such as business plans and records
- Linkage of groups to aggregation centers to CBOs and Cooperatives established by HIH EA.
- Linkage of groups to financial services e.g. Laikipia Enterprise Development Fund, Saccos, NGAAF
- Synergies from partnerships with the county government and other stakeholders ensured sustainability.

- In West Pokot County, the three wards targeted were Riwo (299 beneficiaries), Batei (330 beneficiaries), and Suam (180 beneficiaries), in total 809 beneficiaries from West Pokot.

The counterfactual information was obtained from the comparison wards and groups carefully selected to minimize contamination of the information from the beneficiary group. For each of the three implementing wards, a corresponding comparison ward was identified by the UN-Women, FAO county officers, and county government offices within the same county. The comparison wards considered the following -

- Distance between the beneficiary and comparison wards minimizes information flow yet accessible.
- Similar agro-ecological/climate zones-altitude, rainfall pattern.
- Similar road and market access network.
- Similarity in agriculture/livestock production system.
- Preferably not considered for the World Bank KCEP-CRAL Program (Kenya Cereal Enhancement Program Climate-Resilient Agricultural Livelihoods), KCSAP (the Kenya climate-smart agriculture program), and National Agricultural and Rural Inclusive Growth (NARIG) project (Annex 2).
- Groups selected in the comparison wards should also be comparable in similarity in characteristics (size composition, production activities) to those in beneficiary wards.

In Kitui County – Athi, Kauw'i, and Mutomo were identified as the beneficiary wards while Ikutha, Kithumula Kwa Mutonga, and Kanziko were identified as the non-beneficiary Wards. In West Pokot-Batei, Riwo and Suam were the beneficiary Wards while Chepararia, Kodich, and Kapenguria were identified as the non-beneficiary Wards. In Laikipia- Mukogodo East, Tigithi and Umande were the beneficiary Wards while Nanyuki and Thingithu were identified as the non-beneficiary Wards.

SECTION 2. - EVALUATION BACKGROUND AND CONTEXT

2.1. EVALUATION PURPOSE, OBJECTIVES AND QUESTIONS

The purpose of this evaluation was to measure the level of achievement of the project objectives and the impact of the WEE-CSA project on outcomes, understand the impact pathway, and draw lessons from the implementation process and the impact to inform future programming. There were two specific objectives of the evaluation as cited from the Terms of Reference (ToR) (Annex 3).

i) To collect end-line values for key project indicators as per the log frame. A detailed evaluation matrix with outcomes and output indicators is attached in Annex 4.

ii) To determine changes in the key indicators and assess the impact of the project through econometric methods, including but not limited to the DiD.

The evaluation sought to examine the following questions aligned to the project outcomes.

i) Did the WEE-CSA increase agricultural production, income levels, nutrition status, and climate-resilient livelihoods among the targeted communities?

ii) Did WEE-CSA improve gender responsiveness in climate-smart policies and regulations to enable investments in climate-resilient agriculture at the national, county, and Community levels?

2.2. SCOPE OF EVALUATION

The ETE covered the project implementation period from July 2020 to December 2023 and the no-cost extension period through June 2024. The data for the end-line evaluation was collected between April and May 2024 across the three wards in the beneficiary wards and extended the wards selected to provide counterfactual. The focus of the evaluation was both at the national and county level. At the national level, UN Women WEE-CSA and FAO staff participated as Key Informants in the evaluation highlighting the project's progress, challenges, and achievements. Similarly, at the county level, key informants were drawn from the county staff in the departments of agriculture, livestock, and range management and the Implementing Partners (IPs) who were the front-line implementers. A sample of project beneficiary and comparison groups in the three counties- Kitui, Laikipia, and West Pokot participated in the evaluation through a survey and focus group discussions.

The evaluation covered all the thematic areas including agri-business training, financial literacy, Climate-smart Agriculture (CSA), livestock production and range management, gender advocacy, group dynamics and leadership, leadership and governance, and nutrition-sensitive agriculture. Sampling was representative of diverse groups (including the poor and Persons Living with Disabilities-PLWDs) of beneficiaries and comparison (control) line with the Leave No One Behind (LNOB) principle and was guided by the DiD framework. As per the Terms of Reference, the specific issues in the evaluation entailed the following -

- Carrying out desk review of key documents relevant to the work such as the WEE-CSA Project document, baseline study report, the DiD study report, the rapid assessment report, the Performance Monitoring Plan (PMP), project progress reports, Project Steering Committee minutes/report, CSA-related policy, and strategy documents and relevant DiD method guidance documents to determine the available data to utilize the DiD approach for the impact evaluation end-line study.
- Preparing an inception report for the impact evaluation end-line study with a DiD perspective, including the overall scope, approach, sampling design, schedule, and a detailed outline of the report.
- Refining the data collection tools that were used during the impact evaluation baseline study (soft copy and mobile-based) and develop an analysis plan to enable the DiD analysis to be conducted.
- Preparing the list of the respondents/households (treatment and comparison) that were visited during the impact evaluation baseline study to be followed up during the impact evaluation end-line study.

- Developing the model, parameters, and econometric regressions (in STATA) to be utilized for analysis in the impact evaluation end-line study including the development of the period for data collection for both the control and treatment groups including the ability to take into control for any spill-over effects.
- In collaboration with the UN Women and FAO field officers conducting identification, training, and remuneration of specific county-based survey enumerators for Laikipia, Kitui and West Pokot counties and field testing of the data collection tools.
- In partnership with the UN Women and FAO field officers, coordinating, and support supervision of data collection in the three target counties.
- Undertaking data quality control measures including running data quality checks and providing feedback to the enumerators.
- Cleaning, analysis of the data, and developing a draft impact evaluation end-line study report based on the data analysis plan. This includes indicator-specific analysis by county and beneficiary status, as well as indicator-wide aggregates (or means). The end-line should include an estimate of the impact of the program across the outcome indicators, based on the DiD approach, including significance testing.
- Developing and providing UN Women/FAO with the STATA codes and impact evaluation end-line study raw data.
- Leading a stakeholder validation meeting to present the findings and solicit inputs to inform the final report and revise the draft impact evaluation end-line study report based on comments received from the key stakeholders.
- Developing and academic paper from the report.

2.3. INTENDED USE AND USERS OF THE EVALUATION RESULTS

Table shows the list of the key audience of this report –

Table 1: Audience of the WEE-CSA evaluation report

Audience	Interest in the evaluation
KOICA	Quantified impact of WEE-CSA on women. Evidence to inform the design of the second phase of the project.
UN Women at country, regional and HQ level	Quantified impact of WEE-CSA on women. Evidence to inform the design of the second phase of the project
UN FAO	Quantified impact of WEE-CSA on women. Evidence to inform the design of the second phase of the project
Hand in Hand East Africa (HiHEA)- Laikipia County	Quantified impact of WEE-CSA on women. Evidence to inform the design of the second phase of the project
Anglican Development Services Eastern (ADSE)- Kitui County	Quantified impact of WEE-CSA on women. Evidence to inform the design of the second phase of the project
Village Enterprise (VE)- West Pokot County,	Quantified impact of WEE-CSA on women. Evidence to inform the design of the second phase of the project
Relevant staff in partner government institutions	Women empowerment from the project
Other National NGO's and CSOs	Drivers of Women Economic Empowerment
Academic institutions (TVET projects)	Drivers of Women Economic Empowerment
KOICA project beneficiaries	Understand the positive gains from the project
Relevant staff in UN agencies.	Quantify the impact of WEE-CSA on women empowerment and identify evidence for program design
Relevant staff in UN agencies	Quantify the impact of WEE-CSA on women empowerment and identify evidence for program design
National and County governments	Drivers of women economic empowerment for policy-making purposes.

The findings of this report inform the following stakeholders on program design and intervention strategies in similar or related projects. In line with UN Women's mandate, the evaluation report demonstrated results and accountability by providing information to stakeholders, participants and donors on project performance and the intended and unintended effects of the intervention. Findings on key lessons learned will assist UN Women, KOICA, government stakeholders, and implementing partners to make decisions on interventions that need scale-up.

SECTION 3. - METHODOLOGY

3.1. EVALUATION DESIGN AND APPROACH

This evaluation pulled several strands of approaches. The evaluation employed a quasi-experimental design and regression-based approaches to determine the impact of WEE-CSA intervention and the effect of confounding individual characteristics on several outcomes at household level. The allocation of the WEE-CSA package of interventions was non-random. The impact of these interventions was estimated considering availability of counterfactual information.

In line with the United Nations Evaluation Group (UNEG) Handbook for Integrating Human Rights and Gender Equality Perspectives in Evaluations in the UN System[5], a gender-responsive and human rights-based approach[6] was applied throughout the evaluation process. This entailed analyzing the extent to which the project's strategies, design and implementation sought to address gender inequalities and discriminatory practices that influence men and women participation in decisions regarding the allocation of resources and the use of the proceeds from their use. Implicitly, this implied that the role of the women at household level, their power status and rights were analyzed by examining the shift in perceptions and transformation in the gender space within which they could operate.

The analysis of the impact of the project was gender sensitive making sure that women were considered. By default, the project design and implementation focused on more than 80% women such that most of the impact being evaluated was borne by women. Moreover, in line with the principle of Leave No One Behind (LNOB), the project was inclusive in the implementation with Persons Living With Disabilities (PLWD), men, women, and youth included as project beneficiaries and comparison groups.

The data collection methods were inclusive and participatory. Both male and female enumerators were recruited to participate in the enumeration. Of the 12 enumerators, 5 were female and 7 were male. The quantitative survey, key informant interviews and focus group discussions considered participation of women, men, youth and PLWDs. Although randomly selected, the sample reflected the diversity of the participants as required within the principles of human rights and gender equality. The respondents in the quantitative survey (beneficiaries and comparison group), the key informants and focus groups at all levels were given adequate opportunities to express their views on the project implementation process and the benefits of the project. Validation was conducted with the national staff and donor team that reviewed the report to ensure that the facts were adequately represented as well as the findings and recommendations.

The evaluation was responsive and employed the principles of UN Gender-Responsive Evaluation. It examined the challenges related to cultural practices and norms that prohibit women from participation in agricultural production activities as well as in participation of activities related to public policy-making and development and allocation of government resources. Through this, the evaluation qualitatively examined the transformations in the gender space which have taken place as a result of the WEE-CSA project.

3.2. SAMPLE SIZE DETERMINATION AND SAMPLING

Baseline and end-line survey data was collected from the WEE-CSA beneficiaries and comparison groups. The individuals interviewed were members of the identified beneficiary and comparison groups. The survey exercise traced the individuals who participated in the baseline and interviewed them for the end-line evaluation in the three counties. Annex 5 shows the sampling process (two-stage) sampling process and the distribution of the sample at the baseline.

Power calculations - Due to lack of information on agricultural productivity, logical assumptions were made that farmers can achieve 0.2t/ha (90Kg/acre) in some known value chains like cereals. This was used as the baseline value and that only 50% of the farmers can achieve this productivity. The sample size was determined following Wang and Chow, (2007) proportionate sampling formular as follows -

[5] https://www.uneval.org/document/detail/980
[6] https://www.unwomen.org/sites/default/files/Headquarters/Attachments/Sections/Library/Publications/2020/TRANSFORM-Issue-18-2020-06-en.pdf

$$Sample\ size(n) = \frac{r*Deff[(Z+\alpha)^2*(P_1(1-P_1)+P_2(1-P_2))]}{(P_2-P_1)^2} \quad (1)$$

P1 is the estimated level of an indicator measured as a proportion P1 at the time of the first survey or for the control area (Baseline Values), **P2-P1** is the expected level of the indicator either at some future date or for the project area such that the quantity (P2-P1) is the size of the magnitude of change as it is desired to be able to detect. **Statistical significance** (α =5%=1.96) - confidence interval (how sure we are that the sample estimate reflects the population parameter) or the probability of committing type 1 error was typically set at 5%, that is, $\alpha = 0.05$. This is the degree of confidence (95% confidence level) with which it is desired to be able to conclude that an observed change of size (P2-P1) would not have occurred by chance. **Statistical power** (Z =80%=0.84)- the power of a study is the probability of detecting a real difference or the probability of falsely rejecting the null hypothesis is 0.2 or 20%. This will enable the detection of a change of size ((P2-P1)) if one occurred. A deff parameter[7], the adjustment to the deviation from simple random sampling, was conservatively chosen due to the absence of related previous surveys in the counties of interest. However, it is big enough to allow an adequate sample size to measure all the main indicators. The choice of deff also followed that as simple random sampling could not be used bearing in mind that the sampling population is spread over three counties, distant apart but share similar characteristics in agro-ecological characteristics. The groups could be interpreted akin to clusters that have some homogeneity within them (for instance groups may be comprised of members who share similar poverty levels- hence a high design effect) and thus dictating a larger sample than if simple random sampling was used. Surveys usually do not gain 100% response and as such, a non-response rate of 20% was applied to adjust the sample size. Agricultural productivity is used as the key project indicator to measure the effect size of the WEE-CSA project.

3.3. SOURCES OF DATA AND DATA COLLECTION METHODS

The following sources of data and data collection methods were utilized in collecting data for the evaluation.

3.4.1 DATA SOURCES

Table 2 highlights the various data sources consulted during the evaluation. Data was sourced from internal and external sources. These were either primary or secondary. The secondary internal sources provided information about project progress, achievements, and challenges to implementation. The secondary internal sources were provided by the client (UN Women and FAO).

Table 2: Data Sources

	Secondary (Existing)	Primary (New Data)
Internal	– Annual Report 2022. Kenya Economic Empowerment of Women through Climate-Smart Agriculture in Arid and Semi-Arid Central Areas. 4th Annual Donor Report. – Annual Report 2023. Kenya Economic Empowerment of Women through Climate-Smart Agriculture in Arid and Semi-Arid Central Areas. 3rd Annual Donor Report. – Rapid Assessment Report- Kenya Economic Empowerment of Women through Climate-Smart Agriculture in Arid and Semi-Arid Central Areas. – Project ProDoc Economic Empowerment of Women through Climate-smart Agriculture 2020-2023. – Baseline Report 2022- DID Baseline Survey Report, UN Women 2022	– UN Women staff – FAO Staff – Project Implementing Partners- ADSE-Anglican Development Services Eastern, HIHEA- Hand in Hand East Africa, and Village Enterprise – Project Beneficiaries and key stakeholders – County governments of Kitui, Laikipia and West Pokot
External	– Relevant publications by government MDAs - policies, laws, and gazette notices – Reports and publications by international organizations, CSOs, etc. – Academic and media reports	– Relevant government officials and duty bearers -.

[7] Deff is at times calculated as $Deff = 1 + \partial(n-1)$ where n is the average size of cluster size and ∂ is the intra-cluster correlation (i.e., the likelihood that two elements in the statistic of interest has same value relative to two same values selected from the population through simple random sampling). A value of 0.05 is interpreted, therefore, to mean that the elements in the cluster are about 5% more likely to have the same value than if the two elements were chosen at random in the survey. Assuming a n=30 (average size of groups) and ∂ 0.05, reasonably rounding off the deff to 3.

The secondary external data sources provided information about the context within which the program is being implemented. The primary internal sources constituted the key informant representative of the implementing partners, the UN-staff and county government staff who handled the project implementation at different levels. Table 3 gives a list of persons and groups consulted during the survey.

Table 3: Individuals/Groups Consulted

Name	Designation/Organization
Groups	
Senior Management Team (SMT)	Virtua Group Discussion
Kobuyin Group	West Pokot County
Sirimon Chees Processing Plant	Laikipia County
Daiga Kwinyitya group	Laikipia County
Amuka Wisi (PWD) Group- Mutomo	Kitui County -Athi Ward-
Kanini Kaseo Women Group	Kitui County-Athi Ward- Kitui County
Ngenia Group (PWD)-	Laikipia County
New Vision Self-Help Group (PWD)	Laikipia County
Key Informants	
Wilfred	CECM Agriculture West Pokot
William	Director Gender- West Pokot County
Maiyo Nathaniel	Village Enterprise
Mercy	Village Enterprise
Koki	Kitui County- Focal Point person -Kitui
Christoper Maluki	Kitui County Extension officer -Mutomo
Jane Waweru	Laikipia County - ToT Umande Ward
Rachael Nzulu-	Laikipia County Extension officer- Umande Ward
Dennis Kimiti	Laikipia County -Extension and ToT- Mukongodo East Ward
Eliud Tor	Dept. of Agric- Laikipia County
Pius Butich	Laikipia County Director of Livestock
Hezron Kinyua	County Gender Officer
Jemimah	ToT-Mutomo Kibwea Ward, Kitui County
Hellen Ndanu	Program Officer ADSE
Phyllis Wanjiru	HiH Gender Specialist- Laikipia

3.4.2 DATA COLLECTION METHODS

The ETE used both primary and secondary data. Primary data was collected from the random sample of beneficiaries and comparison households simultaneously. The team of enumerators used in data collection in the baseline was recruited for the end-line in West Pokot and Laikipia Counties, except in Kitui County where two enumerators who were recruited for the baseline were not available and were replaced with new ones. The key Informant and FGD checklists are attached in Annex 6.

Desk/Literature Review - A desk review of the project proposal document, the log frame, baseline report, and project annual donor reports was conducted. Moreover, a review of published literature was also conducted. The aim of conducting the desk review of the project reports and other relevant documents and literature was to understand the background, context, goals, objectives, implementation approach, and expected outcomes of the project.

Key Informants/In-depth Interviews - Key informants included project staff at the UN Women and FAO senior management and project staff, County staff in agriculture, livestock, and environment departments, Training of Trainers, and representatives of the three Implementing partners. The evaluation targeted to interview the focal point persons (Kitui, Laikipia, and West Pokot), the IP Lead persons- (Kitui, Laikipia, West Pokot), ToTs/Extension officers- (Kitui, Laikipia, West Pokot), FAO-County Reps- (Kitui, Laikipia and West Pokot), and county Government – CECM/Directors in Agriculture or Gender Departments- (Kitui, Laikipia and West Pokot). A total of 16 key informant interviews were conducted across the three counties. The key informants provided information with regard to the project achievements, implementation process, and challenges and about sustainability after the WEE-CSA came to closure. Table 4 shows the number of key informant interviews conducted.

Focus Group Discussions -A total of 7 focus group discussions were conducted. 2 in West Pokot County, 3 in Laikipia County, and 2 in Kitui County. The FGDs were inclusive with women, men, youth, and persons Living with Disability (PLWDs) included in the groups. In Laikipia County, 2 of the FGDs and 1 in Kitui County comprised groups with PLWD members (men, women, and youth). The FGDs

provided perspectives, especially on program implementation challenges that were not captured in the survey questionnaire. The information was used to complement the results of the survey data.

Direct observation - The researchers and assistants made necessary observations, especially regarding the environment, livelihoods, and well-being of the wards in which the project is being implemented. This information helped in complementing the statements obtained through key informants and FGDs. Information from observations, for example on the extent of adoption of climate-smart technologies helped in moderating the responses.

Table 4: Number of Key informant Interviews conducted

County	West Pokot	Laikipia	Kitui	Target	Achieved
Focal Point persons	1	1	1	3	3
IP leads/representatives	1	1	1	3	3
Trainers of Trainers (ToTs)/Extension	1	4	3	9	8
CECM/Directors	1		1	3	2
UN Women Senior Project Management				1	1

Beneficiary and comparison group members survey – the end-line survey collected quantitative data from 517 farmers consisting of beneficiary and comparison group members from the three counties. These were traced from the baseline random sample of 610 beneficiary and comparison group members.

3.4.3 ENUMERATION AND DATA QUALITY MANAGEMENT

Recruitment of the enumeration team - The lead consultant, with the help of the project staff at counties, recruited and trained enumerators from the three counties. The Curriculum Vitae (CVs) of the enumerators identified from the three counties were forwarded to the consultant to select the appropriate enumerators by the UN Women field team. From 40 CVs provided, 12 enumerators, and four (4) enumerators from each of the three (3) counties, all first-degree holders with relevance to agricultural economics, statistics, project management, environment, and experience in data collection using online platforms were selected. Also, consideration was given that the enumeration team should come from the local community and that they could communicate in the local language. Such allowed the enumeration team to administer the survey without having the questionnaire translated into the local language.

The enumerators were trained by taking them through data collection survey instruments on paper and in the online platform, the Kobo-Collect. The training emphasized the “art” of asking questions and the translation and interpretation of the questionnaire in the local language to make it easy for the respondents to answer effectively. Moreover, the training also emphasized the skip patterns and the application of the questions.

The team of enumerators recruited to undertake data collection in the counties formed the enumeration teams supervised by an assistant consultant from the consultant team who was enlisted to support data collection. Consideration was given to the enumeration team that was also involved in the baseline evaluation. Of the 12 enumerators, only 2 enumerators were not involved in the baseline evaluation. The assistant consultants verified survey data for completeness assisted in backchecks when necessary and assisted the enumerators in transferring the filled forms from the smartphones/tablets to the Kobo-Collect storage platform. Both the enumerators and supervisors were given orientation training on the overall process of data collection

Pilot and validation of the data tools – the survey data collection tool was validated through a pilot survey organized immediately after the enumerator training. The pilot was conducted for groups participating in the project but was not part of the sampled groups for the survey. The pilot exercise verified the skip patterns and the logic of the data collection tool. The pilot also identified extra options that were added to the questions as well as grammatical errors and the applicability of the tool in the local context. The pilot was also used to test the ease with which the respondents could answer the questions as this would determine the time taken to fill the checklist and consequently the overall data collection time. All the identified issues in the data collection tools were addressed and communicated to the enumeration team before the date to commence the actual survey.

In the field, the sampled groups were traced with the help of the UN Women and FAO field staff. Logistic maps were developed together with the enumerators and the drivers to ensure that every group was reached at the right time. This would avoid groups being mobilized and take long waiting for the enumerators.

Data quality management - The data quality management included measures put in place before, during, and after data collection to ensure completeness, validity, and reliability. These include:

Level I: Data Quality Control at designing data collection tools

i) **Designing of the data collection tool** - Data collection tools were developed by the consultant and reviewed by the client (UN-Women, FAO, and KOICA office) to ensure that there were adequate and, sufficient questions to capture data that will enable estimation of all the log-frame indicators.

ii) **Training of the enumeration team** - The enumeration teams in each county were taken through the data collection tools. This was despite the teams being the same ones that enumerated in the baseline in 2022 and that the survey tool remained largely the same in order to collect the same information as in the baseline. The enumerators were taken through the survey tools with an empasis on how to or "art" of asking questioons and where necessary, the proper translation to local or generally undestandable language to the respondent.

Level II: Quality control during collection of data

i) **Designing skips in the online platform**- To minimize errors, and ensure accurate data entry the Kobo-Collect data form was programmed using skips and codes where necessary.

ii) **Checks for completeness, consistency**- At the end of each day, all the data filed forms from the tablets were transferred to the Kobo Collect platform at the end of each day by each enumerator. Before transferring to the Kobo-Collect platform, a random sample of the data forms from each enumerator were checked for validity, reliability, completeness, integrity, precision, and timeliness on daily basis by the assistant consultant. If the completed data forms were found to be satisfactory, they were transmitted from the tablets to the Kobo-Collect platform storage.

iii) **Callbacks for correction**- Unsatisfactory cases were cross-checked through callbacks to ensure accuracy, correctness, consistency, and completeness.

Level III: AFTER: Quality control after data collection

i) **Cleaning and storage** – completed survey records were exported from the Kobo-Collect platform to Excel and then to STATA for cleaning and analysis. Data was cleaned using programmed codes developed in STATA to deal with outliers and missing values. Where values are missing or are outliers, they will be replaced with group averages where necessary. Cleaned data was transferred to UN Women for storage. The evaluation team ensured a high level of data security. All data collected were kept securely by team members in a password-protected computer. The data was only accessible to the evaluation team members and care was taken to ensure that the data was not accessed by people not authorized to access it.

3.4.4 SUMMARY DATA DESCRIPTIVES

In the end-line survey, a total of 517 respondents were reached and interviewed physically. A comparison of baseline and end-line samples remained insignificantly different. The average age of group members was 48 years the beneficiary and comparison groups are presented in (Table 5).

The male and female composition of the and did not significantly differ between the beneficiaries and comparison groups at baseline and even at the time of the end-line evaluation. During the baseline, the beneficiary and the comparison differed significantly in crop farming, small-scale businesses in access to social assistance, and household sizes. Compared to 72%(n=166) of the comparison group, a higher percentage (85%; n=326) of beneficiaries depended on crop farming as a source of income. A smaller percentage 20% (n=326) of the beneficiaries relied on small-scale businesses compared 29%(n=166) of the comparison. The comparison had also larger household sizes compared to the beneficiaries.

The education level of the group members did not also differ across all the levels of education. Similarly, the household size (number of household members) was estimated to be 6 and comprised of an average of 2 members below 15 years of age and did not have members above 65 years. The households shared similar sources of income with households engaging in crops and livestock farming as the two major sources of income to the households. While all these differences were noticeable during the baseline, they were not observed during the end-line. For the end-line sample, differences between the comparisons were only observed in the cases of remittances ($p<0.05$) as a source of income and social assistance ($p<0.1$).

Apart from engagement in crop farming, engagement in small-scale businesses, and social assistance the beneficiary and comparison group members had indistinguishable characteristics suggesting that the randomization of the beneficiary and comparison group members was successful to a larger extent.

Table 5: Descriptive statistics

	Baseline				End-line			
	Comparison (n=166)	Beneficiaries (n=326)	t value	p value	Comparison (n=166)	Beneficiaries (326)	t value	p value
Member Age(Yrs)	46	46	-0.35	0.733	48	48	-0.45	0.648
Gender (M=1; F=0)	15%	12%	1.05	0.304	14%	12%	0.75	0.447
Education levels								
Never attended school	22%	23%	-0.4	0.683	19%	22%	-0.65	0.514
Primary Level/Madrassa	46%	50%	-0.75	0.45	46%	52%	-1.2	0.228
Secondary Level	22%	21%	0.45	0.659	24%	20%	0.95	0.337
Technical Training	9%	6%	1.25	0.215	6%	5%	0.35	0.717
University	1%	0%	0.45	0.662	4%	1%	2.2	0.028
Sources of Income								
Crop Farming	72%	85%	-3.25	0.002***	92%	91%	0.15	0.863
Livestock rearing	83%	83%	-0.1	0.936	72%	76%	-1.1	0.268
Formal Employment	7%	3%	1.65	0.101	6%	3%	1.25	0.209
Cashual Employment	33%	39%	-1.2	0.227	24%	19%	1.05	0.293
Small-scale Business	29%	20%	2.1	0.039**	21%	20%	0.15	0.888
Rent	1%	1%	0.6	0.535	1%	0%	0.45	0.662
Social Security Benefits	1%	1%	-0.75	0.467	0%	0%	-1	0.318
Benefits								
Remittances	2%	2%	-0.05	0.979	0%	2%	-2.25	0.025**
Social Assistance	0%	2%	-2.65	0.008***	0%	1%	-1.75	0.084*
Household size (#)	7	6	2.5	0.014**	6	6	1.35	0.177
HH members 15 years and below	3	2	0.85	0.396	2	2	0.5	0.602
HH members 65 years and above	0	0	-0.75	0.464	0	0	-0.4	0.671

***p<0.01; **p<0.05; *p<0.1

3.4. ANALYTICAL APPROACH TO THE END TERM EVALUATION

The analytical approach pulled strands of analysis from principal component approach and resilience analysis to build some of the indicators that measured the project outcomes. The unit of analysis for this evaluation, like in the baseline, was an individual who was a group member in the beneficiary group or the comparison group. The quantitative analysis was anchored in the Difference-in-Difference (DiD) impact evaluation framework and technique.

3.2.1 DIFFERENCE IN DIFFERENCE FRAMEWORK

The evaluation drew from strands of impact evaluation employing quantitative and qualitative techniques. In line with Khandker, et al, (2009) which postulates that difference in difference is the difference in change between beneficiaries of the WEE-CSA and the comparison group over time (T) from the project baseline to end-line as shown in Equation 2.–

$$DiD\ impact = \underset{Beneficiaries}{(Y_4 - Y_2)} - \underset{Comparison}{(Y_3 - Y_1)} \quad (2)$$

The DiD framework in equation 2 is transformed into an estimable regression framework as follows -

$$Y_{it} = \beta_0 + \beta_1 t + \beta_2 I_i + \beta_3 I_i t + \mu_{it} \quad (3)$$

Where Y_{it} is the outcome of interest and in this case, agricultural productivity and β_3 is the WEE-CSA impact and concerns all the outcomes of the project including increased area under CSA technologies, food security, household resilience to climate change and food insecurity, women's economic empowerment, and household income. In this case, $I_i = 1$ is for the WEE-CSA beneficiaries, and $I_i = 0$ is for the comparison group and $t = 0$ before intervention (baseline) and $t = 1$ is after intervention (end-line) and μ_{it} is a random term with zero mean and constant variance.

From Equation 3, the empirical estimable equation aligned to DiD in Equation 2 is set up as follows -

$$Y_{it} = \beta_0 + \beta_1 time + \beta_2 Intervention_i + \beta_3 (Intervention * time) + \gamma_j X_{ij} + \mu_{it} \quad (4)^8$$

Where the parameters and variables in Equation 3 represent the following -

- i is the index of the households sampled j is the jth variable and t indexes time
- $\boldsymbol{Y_{it}}$ is the WEE-CSA outcome variable- say food security, agricultural productivity in various value chains, household resilience to climate shocks, and poverty among others.
- $Intervention$ a binary which is =1 if the respondent benefited from WEE-CSA interventions and =0 if the respondent did not benefit (comparison).
- $time$ = 1 denotes the end-line and 0 denotes the baseline.
- $Intervention * time$ is the interaction between the WEE-CSA interventions and the time of project intervention (baseline and end-line)
- X_{ij} are time-varying household characteristics (covariates) specific to individual respondents in the survey.
- γ_j coefficient of household characteristics
- β_0-group level time-invariant effects –e.g. distinct Y intercepts for each group (Beneficiary and Comparison).
- β_1 coefficient of dummy timestep (to account for the difference before and after) indicator (if the change between the times is used, this falls off).
- β_2 coefficient of dummy participation in the project indicator (to account for average permanent differences between beneficiary and comparison).
- β_3 the DiD estimate –the parameter of interest. This is the ATE (Average Treatment Effect) will be concerned with the difference over time of the comparison group subtracted from the WEE-CSA beneficiaries. Covariates are incorporated in the analysis to condition the above equations.
- μ_{it} is the random error term-normal distribution and constant in variance

3.2.2 ASSUMPTIONS OF DID

The estimation of impact through DiD follows three key important assumptions- the parallel trends, stable unit treatment value, and exogeneity assumptions. The parallel trends assumption states that the endogeneity and unobserved heterogeneity in program participation may be present but that such factors are time-invariant. This impact evaluation study will, therefore, be based on the following assumptions:

(i) The potential outcomes would not have been different over time in the beneficiary group compared to the comparison group if the program had not been introduced (Lechner, 2011). This is confirmed by the graphical tests for parallel trends assumption. The assumption held for beans, bulb onions, green grams, vegetables and Galla goat (meat goat), poultry, eggs, and honey (Annex 7). Violation of the parallel trends' assumption leads to a biased estimate of the effect.

(ii) The selection bias is time-invariant, that is, changes in potential outcome variables –agricultural productivity (for the target value chains), food security, women empowerment, and resilience to

[8] A log transformed version of Equation 4 is $lnY_{it} = \beta_0 + \beta_1 time + \beta_2 Intervention_i + \beta_3 (Intervention * time) + \gamma_j X_{ij} + \mu_{it}$ which implies that the underlying model is multiplicative rather than additive, i.e. $Y_{it} = \exp(\beta_0 + \beta_1 time + \beta_2 Intervention_i + \beta_3 (Intervention * time) + \gamma_j X_{ij}) \mu_{it}$. The log-transformed model approximates the proportional difference across groups rather than outcome difference between comparison and beneficiary groups across time.

climate shocks due to the intervention are not a function of the initial conditions that influenced program participation. That is, they do not determine the allocation of intervention.

(iii) There were no other programs introduced concurrently, and no time-persistent shocks, and the comparisons were selected to minimize information flow that would lead to contamination of the impact estimation and thus ensure that Stable Unit Treatment Value Assumption (SUTVA) was held. SUTVA dictates that the beneficiary and comparison groups remain stable for repeated cross-section design and that there is no spillover (Dufflo et al., 2008). SUTVA was met through careful selection of the beneficiary and comparison groups for the evaluation exercise. Section 1.3.7 addresses part of SUTVA assumption.

Exogeneity of the intervention was ensured through the specification of the DiD equation and tests of multicollinearity will be conducted on the conditioning variables.

3.2.3 COMPUTATION OF RESILIENCE AND WOMEN ECONOMIC EMPOWERMENT INDEXES

The estimation of the household resilience index followed Alinovi et al. (2010). Accordingly, household resilience is a latent variable determined by the following fundamental pillars: social safety nets (SSN), access to basic services (ABS), adaptive capacity (AC), income, and food access (IFA), and Assets (A). The pillars of resilience are generated separately; different variables are aggregated to compute each pillar. An index of household resilience was obtained using a principal component approach employing the pillars of resilience Annex 8. Similarly, the computation of the Women's Economic Empowerment Index to climate change employed the principal component approach. The computation considered the following variables or their composites in relation to women empowerment - Women Decision Index (WDI), Gender Voice Index (GVI), Awareness of Climate Change and participation in gender policy-making (GCC), Capacity building (CAP), Participation in markets for the selected value chains (COM), Credit (individual and group) and Land Ownership Annex 9.

3.2.4 ADJUSTMENT FOR ATTRITION

As aforementioned, the 19% attrition occurred because respondents had moved from their places of original residence (due to conflict or in search of employment or pastoral areas in search of pasture and water), death of respondents, refusal to participate in end-line interviews or that the respondents could not be traced. The 19% was inclusive of cases collected during the end-line that did not match the end-line sample. Although attrition may not be a perversive problem in obtaining consistent estimates (Alderman et.al., 2000), it may lead to panel samples with serious deficiencies for descriptive and analytical purposes (Thomas et al., 2001) since exits may correlate with individual or household characteristics in a way that biases estimate of the population or behavioral characteristics.

In this evaluation, tests for attrition entailed examining the significance of the lagged outcome variable on the probability of non-attrition ($P(A = 0|y, x, z)$ where z (preferably a lagged y) is an auxiliary variable that is observed for all units but not included in the x_s. Non-significance (acceptance of null hypothesis for the lagged variable) confirms the absence of attrition bias in the parameters of interest. Note that $P(A = 1) if\ A^* \geq 0$ and $P(A = 0) if\ A^* < 0$, where $A^* = \partial_1 x + \partial_2 y + \epsilon$ and $A = 1$ is an attrition indicator equal to 1 if an observation is missing (Attrition) and equal to 0 if an observation is not missing (Non-Attrition). Annex 10 presents the results of attrition tests. The results show that the lagged outcome variables (variables at baseline) have no significant effect on the probability of attrition. All the outcome variables tested show no significant effect on the probability of attrition. Thus, the end-line analysis is based on the 492 respondents who matched the baseline sample. These constitute 92% of the 517 reached during the end-line assessment. As aforementioned, 25 respondents reached during the end-line survey were new respondents who were not covered in the baseline.

3.2.5 CONTROLLING FOR HETEROGENEITY

Heterogeneity between the beneficiary and control group causes shifts in the time trend and affects the magnitude of the impact (ATET). To address these variation challenges, demographic or individual-level

variables are included in the estimation to condition the variance of the regression coefficient estimates (Angrist & Pischke, 2009, chapters 2 and 5; Wooldridge, 2012, chapters 6 and 13). One of the effects that need to be purged out of the estimates is the effect of other programs that may have taken place over the same period. Notably, at the baseline, an estimated proportion of the beneficiaries and comparison group reported participation in other similar programs – The KCSAP and National Agricultural and Rural Inclusive Growth Project (NARIGP) or other programs were implemented concurrently with WEE-CSA. Both projects had components of CSA and or dealt with the same value chains. An estimated 27% of the beneficiaries and 16% of the comparison group members reported to have participated in other similar programs at the end-line. Between the baseline and the end-line, the proportion that reported to have participated in another related program increased from 8% to 12% in West Pokot County, 6% to 12% in Laikipia County, and increased most in Kitui from 4% to 46%. KCSAP was the most common program. World Vision Kenya, Adventist Development and Relief Agency (ADRA), Christian Aid, Caritas, Action Aid Kenya, German-Agro-Action (WHH), and the respective county governments, implemented programs related to WEE-CSA. The effect of these programs overcrowds the estimation of the impact and may lead to overestimation of the magnitude of the impact of WEE-CSA. To control these effects, a dummy (1- if the respondent engaged in other programs and 0 otherwise) is included as a covariate.

The three counties in which the program was implemented vary in several ways including agroecological and biophysical factors, and structural factors such as distances to basic social amenities- water, schools, health service centers, and governance. For instance, the decisions made by governments vary in terms of allocations and activities related to the WEE-CSA. In Kitui County, extension officers were seconded into the project and their county deliverables harmonized with those of WEE-CSA giving a stronger advantage and focus on implementation. In Laikipia, the implementing partners (IP) had to be changed due to the unsatisfactory model of delivery. Notably, all the IPs had different models of implementing the project across the three counties as previously indicated and this may partly lead to the differences witnessed across the counties. Moreover, demographic characteristics also contribute to the achievement of project impact. Notably, most of these demographic characteristics are time-invariant as were the factors that influence participation in the project.

3.2.6 IMPACT PATHWAY

To establish the pathway through which WEE-CSA created an impact, it is hypothesized that the adoption of CSA technologies and practices influenced productivity and led to the economic empowerment of women. Empowered women participate effectively in contributing to household expenditures and thus, the food security position of the household was strengthened.

The evaluation used the area under climate-smart technologies to proxy the adoption of technologies in a system of equations to identify the impact pathway. The number of months of food shortage is used to measure the status of household food security while women's economic empowerment is proxies by the women empowerment index to climate change. The evaluation employed the following estimation strategy -

$$A = \alpha_0 + \alpha_1 Y + \alpha_2 X_1 + \varepsilon_1 \quad (5)$$

$$Y = \gamma_0 + \gamma_1 A + \gamma_2 X_3 + \varepsilon_2 \quad (6)$$

$$W = \delta_0 + \delta_1 A + \delta_2 X_3 + \varepsilon_3 \quad (7)$$

$$F = \beta_0 + \beta_1 W + \beta_2 X_4 + \varepsilon_4 \quad (8)$$

Where A is the adoption of climate-smart technology (1 if a farmer practices or has at least some area of farmland put under CSA, and zero otherwise), W is the women's economic empowerment index ranging between 0 and 1, and F is the food security measured as the number of months a household faces food shortage. X_1-X_4 are conditional variables that condition the simultaneous system of equations.

The system of simultaneous equations comprises dependent variables with mixed specifications- some dummy variables and others continuously creating endogeneity in the system. For instance, farmers could self-select to the adoption of CSA technologies and thus make equation on A endogenous. Similarly, F reveals that some households are likely to have zero number of months while others exhibit some months of food shortages. The food security equation (8) exhibits censored data with some households having zero

months of food shortages hence estimated as a tobit model. The W or women empowerment index is bounded between 0 and 1. The simultaneous system is thus estimated using conditional mixed process (*cmp*) according to (Roodman, 2011[9]).

Data Analysis

The ETE employed a mix of quantitative and qualitative analysis methods depending on the specific objective and indicators. Data from the Kobo Collect was downloaded into Excel and exported into STATA for cleaning. Once in STATA, the data was subjected to descriptive analysis of frequencies, range, and variance analysis to identify outliers.

Data cleaning, outliers, and missing values - Outliers and missing values of the continuous variables were either deleted or replaced with average values or median values depending on the nature of the variable. Cleaning also entailed destringing all the string variables to numerical values, re-labeling, and recording the data to analytical forms.

Qualitative data from KIIs and FGDs - the qualitative data collected using key informant and focus group checklists, and thematic coding was used to ensure that all information was adequately included in the analysis. The evaluators transcribed the qualitative information following themes that mapped out the project logic matrix and the analysis was aligned to important program thematic areas including crop and livestock productivity challenges, norms and cultural elements that prevented women from engaging in economic activities, ways in which the project interventions could be sustained beyond the project closure and benefits from the project. The information from the qualitative sources (KIIs and FGDs) was synthesized and integrated into the overall analysis to explain trends obtained from the quantitative data and as well in substantiate the conclusions and recommendations.

Quantitative analysis for indicators: Quantitative data analysis was carried out in STATA. Quantitative data and analyzed using simple statistical summaries. Quantitative approaches for data analysis on production and supply levels for each value chain, constraints, marketed quantities, and value among others included descriptive statistics generated through frequencies, means, shared components and medians and regressions, and correlation analysis. For the quantitative analysis, a FACT SHEET with measured indicators (log matrix) was developed measuring frequencies, means, and proportions/percentages among others depending on the type of indicator.

In line with UN Women Evaluation Guidelines handbook[10], all the data was disaggregated by sex and other basic data about the respondents such as disability status. The context, relationships, and power dynamics were integrated into the data analysis process. The data was used to analyze structures that contribute to inequalities experienced by women, men, girls, and boys, particularly those experiencing multiple forms of exclusion.

3.5. LIMITATIONS AND MITIGATION STRATEGIES

The evaluation process encountered the following data and methodological limitations:-

1. **Inaccessibility in some of the project areas and groups due to rainfall and security**- In West Pokot County some areas could not be accessed because of the rains. In West Pokot, these included in Riwo Ward- Nakuyen village, Kobuyin village, Parasnda village, and Murktwo group while in Chepararia Ward- Anwan, Sla, and Chepturnguny villages. In Laikipia County- Mukogodo East could not be accessed due to insecurity and even a group (Oleratia group) that was participating in the project had disaggregated and members migrated to other parts of the country. Members of these groups in some of these inaccessible areas contributed to attrition as they could not be replaced. Cases of program dropouts and/or thus not traceable were addressed as attrition. These were evaluated and if deemed that attrition affected the estimators, then the data was re-weighted.
2. **Contamination of beneficiaries and comparison groups by other programs including KCEP CRAL and NARIG projects-** In some administrative wards, the national government and the respective county government were implementing the World Bank KCEP-CRAL Program (Kenya

[9] Roodman, D. (2011). Fitting Fully Observed Recursive Mixed-Process Models with Cmp.*The Stata Journal, 11*(2), 159–206.
[10] UN Women. How to manage Gender Responsive Evaluations: Evaluation Hand-book

Cereal Enhancement Program Climate-Resilient Agricultural Livelihoods), KCSAP (the Kenya climate-smart agriculture program) and National Agricultural and Rural Inclusive Growth (NARIG) project which had some of their activities closely related to WEE-CSA. The presence of such projects would crowd out the estimation of WEE-CSA impact. In such cases, the effect of these programs was captured in a dummy variable question and the questions were included in the quantitative analysis to purge out their effects.

3. **Inadequate information and data to examine the parallel trend assumption**- during the baseline, the project did not have adequate data to examine the parallel trend assumption. The assumption is a necessary condition for the use of DiD impact quantification technique, which if estimates without satisfying the assumption, then there arises a possibility of over- or under-estimating the impact. In this case, to create data that could be used to examine the parallel trend assumption, recall questions were included in the survey to capture crop and livestock productivity variables. This data was then used to plot the productivity trends for the value chains of concern.
4. **Inadequate information on group members**- Unavailability of the list of group members limited random sampling to sampling of the group. As such, the identification of the number of members to be interviewed per group was relegated to the chairperson of the group. Although the chairpersons were guided to random selection with inclusivity (men, women, youth, and PLWDs), this could not be verified in the data. This introduced a selection bias in the data. At the analysis level, the bias introduced was addressed by the use of robust standard error estimation due to possible clustering.
5. **Language Barrier:** The illiteracy level in targeted counties is quite high. To address this barrier, enumerators from the local community were employed to collect the data. These enumerators were also taken through the data collection tools (survey, KIIs, and FGDs) so that they could acquaint themselves with the tools. Further, enumerators from the same tribe were paired to practice interpretation of the questions to ensure a similar translation of the questions during the interviews.
6. **Attrition** – as aforementioned, sample attrition occurred over the implementation period. Attrition resulted from the inability to trace some of the respondents, and refusal to participate in end-line interviews or had moved away from the implementation areas due to insecurity in some areas. The effect of attrition was examined through statistical tests and was found not to have a significant effect on the consistency of the estimates.
7. **Non-response in data** – A non-response rate of 6% resulted during the baseline. However, a 20% rate of non-response had been added to the sample size to adjust for non-response and maintain the sample to a size that would allow for statistical power and significance.

3.6. ETHICAL CONSIDERATIONS

The evaluation was guided by the UNEG Ethical Guidelines and the UNEG Code of Conduct for Evaluation in the UN System which include independence and impartiality; credibility; honesty and integrity; confidentiality; informed consent and assent; and avoidance of harm. The evaluator paid attention to the protection of the respondent's privacy and received oral consent from all interviewees. This was achieved by explaining the purpose of gathering information, its use, and users, and assuring respondents of their privacy. In addition, the evaluation process adhered to the quality and ethical standard as indicated in the evaluation guidelines by for instance asking for oral approval for the evaluator to take notes/record their responses and prepare a report from this information. Further, the following measures were put in place –

Independence and impartiality- The consultants ensured that they always remained impartial and independent from UN Women and other key stakeholders of the program. Key informant interviews with stakeholders were conducted in the absence of UN Women staff and beneficiaries participated in the FGDs without the presence of IPs or UN Women to enable them to participate freely. Evaluation judgments were thus independent, based on clearly articulated reasons, and supported by solid evidence. Further, clear reasons for evaluative judgments and the acceptance or rejection of comments on evaluation products were provided in written "comment trails" for each version of the evaluation deliverables. All findings were triangulated and corroborated.

Accuracy, completeness and credibility- The consultant ensured that the evaluation process remained credible and based on reliable data and observations that could be triangulated. To increase the credibility of data collected, triangulation of information/data from multiple sources and different locations was done. All evaluation questions were answered through triangulation of quantitative and qualitative data from multiple sources and were processed using multiple analytical tools

Confidentiality- The evaluation process ensured that the participant's right to provide information in confidence was respected and participants were made aware of the scope and limits of confidentiality. The following measures were taken to ensure the confidentiality of the information and respondents -

- KIIs and FGDs were conducted in secure places where participants were free to discuss their views confidentially. The consultants also ensured that sensitive information could not be traced back to its sources by using identifiers instead of the participants' names during the FGDs and note-taking.
- In the context of the conflict situation and patriarchal values prevalent in some of the counties visited, anonymity was important in ensuring that participants in the evaluation were protected from reprisals if they provided certain information that could be considered sensitive.
- Enumerators were informed of the need to assure the respondents that the data and information collected from them would remain confidential and would only be used for the purpose of the project report without citing respondents. This was done to assure the respondents of the confidentiality of the information they gave.
- To ensure the authenticity and validity of the evaluation, the enumerators were introduced to the respondents by Trainers of Trainers (ToTs) who were point persons in the project.
- Enumerators obtained informed consent from the respondent to participate in the survey. Furthermore, the beneficiaries were assured of their anonymous status and confidentiality of the information provided and non-citation of names of respondents as references in the evaluation report.
- To ensure that no children were interviewed, the data collection exercise targeted respondents above 18 years of age. If the respondents did not consent or were below 18 years of age, then the data collection program was designed to exit the survey for that respondent and a replacement for the case sought.

Respect for Dignity and Diversity - The evaluation process respected differences in culture, local customs, religious beliefs and practices, personal interaction, gender roles, age, and ethnicity, and was mindful of the potential implications of these differences on the evaluation findings. Participants were given the opportunity to exercise their local customs when convening meetings such as praying; and were requested to participate in the FGDs using a language that they were comfortable with. To minimize disruptions to the daily life activities and routines, participants were given an advance notice about the meeting and the approximate time that they would spend participating in the FGDs to enable them to plan. In addition, FGDs and interviews of the beneficiaries and comparison group samples was planned for to take place in non-market days to avoid disrupting participation in market.

Informed Consent and Assent - Verbal informed consent was obtained from each respondent and FGD participant before they participated in the evaluation. An opportunity to ask questions until they fully understood the study and the implications of their participation was given to the participants. Participants were assured of confidentiality and the right to withdraw from the research at any time of the interview.

Avoidance of Harm - The evaluation process sought to minimize risks to, and burdens on, those participating in the evaluation. Interaction with project participants was done in secure places.

Transparency - The consultants clearly communicated to stakeholders the purpose of the evaluation, the criteria applied and the intended use of findings for them to appreciate the purpose and objectives of the evaluation.

SECTION 4. - EVALUATION FINDINGS

The purpose of this section is to examine the changes in the key indicators and determine whether the changes in the observed can are attributed to WEE-CSA project interventions. The section is divided into three subsections. In subsection 4.1 the report demonstrated the outputs achieved by the project over the period of implementation and across the beneficiary and comparison groups. A test of means is used to examine the significance of the change over time and across the two groups. The output indicators follow in sequence the indicator matrix (Annex 11). The indicators are measured as proportions except the indicator of policy development in the focus counties. In addition to these outputs, the project has generated a wealth of reports documenting its activities, outcome and impact. These include the DiD baseline evaluation report, 2 Annual Donor Reports, Rapid Assessment Report, DID-end-line evaluation report. These resources offer valuable insights into the project's progress and achievements, as well as its contributions to agricultural development and gender empowerment in Kenya.

In section 4.2, the report examines the outcomes from the WEE-CSA including area under climate-smart agriculture technologies, productivity in crops and livestock value chains (beans, onions, fodder, green grams, potatoes, vegetables, dairy goat, milk, doper, meat goat, poultry, eggs and honey). Although the primary indicator of the WEE-CSA project was productivity, other outcomes that were measured include – household income and poverty, household food security (FIES), women economic empowerment and resilience. In subsection 0, results of attribution are presented and discussed. The changes in outcome indicators are attributed to the WEE-CSA interventions quantitatively using the DiD analysis that tests the significance of the Average Treatment Effect on the Treated (ATET). Sub-sections 4.4, 4.5 and 4.6 respectively discuss the gender equality and human rights; project implementation challenges and sustainability.

Before the data analysis commenced, the dataset was subjected to data quality checks and Assesment. Six dimensions of data ensure its quality. These six dimensions include accuracy, completeness, consistency, timeliness, uniqueness and validity. The WEE-CSA data (both baseline and end-line) used in this evaluation met the standards of data quality. Of importance was the completeness and non-response rates, the data from the survey represented all the indicators of the project. Initial steps to ensure data completeness entailed designing a questionnaire or data collection tools that explored the whole scope of the project log-frame matrix. The data tool was designed by the evaluation team together with the client (UN-Women) and exposed to the enumeration team through training with Kobo-Collect forms designed to ensure that none of the questions would be left unfilled. These measures ensured that only non-responses (entries) could only be the issue to address on the completeness dimension. To cater for a representative sample that would allow for statistical power and significance, a non-response rate of 20% was added in the calculation of the sample size as a buffer to avoid smaller than allowable statistical sample size. Missing values were replaced with median values. After data files were all uploaded, the non-response rate. The final sample was determined to be 650 at the baseline, equally split between the beneficiary and comparison groups. Data was collected using Kobo-Collect platform reaching 610 respondents out of the determined total of 650 (6% non-response rate). During the end-line survey, the end-line evaluation survey interviewed a total of 517 respondents traced from the baseline. The 517 respondents reached during the end-line evaluation included 25 (4.8%) cases who were not part of the baseline sample. Of the 25 cases, 18 (72%) were reached through the comparison groups while 7 (28%) were from the beneficiary groups. This meant that cases which could be matched to the baseline sample for examination or estimation of differences were 492 (517-25). Compared to the baseline sample size of 610, the end-line evaluation sample was less by 118 cases. As such, the attrition rate was estimated to be 19% of the baseline sample size. This attrition resulted from untraceable members, death, fallout from groups, and migration due to security related issues (for example Oleratia group in Laikipia, Mukogodo East). The sample distribution for both the baseline and end-line is shown in Annex 5. Although non-response rate cannot be ignored, low response rate may not necessarily compromise survey results. A response rate 75% and above allows for generalization of survey results (Burkell, 2003). Moreover, high response rate is desirable because of effect on precision and power, but using it without determining the non-response bias may not be used to dismiss results as uninformative. (Meterko et al 2015). The final sample, matched was 492, a size that allows for an 80% change of detecting effect sizes of each magnitude even above the 0.05 alpha level in accordance to Cohen (1992). The rest of the data checks are explained in Annex 5 as well.

4.1. OUTPUT INDICATORS

POLICY DEVELOPMENT AT COUNTY LEVEL

Finding 1: Support to policy, legal and institutional development yielded increased budget allocation towards Climate-smart agriculture and gender related issues.

Counties have lagged behind in cascading policies meant to spearhead development in their jurisdictions. According to key informant discussions, the delay is occasioned by lack of capacity and financial resources. The WEE-CSA project facilitated the alignment of county development plans with national Climate Change Action (CCA) and CSA plans and policies. More than 259 county government staff participated in the training on alignment of CSA to the county and national development policies and plans. While over 300 county officials were trained on gender responsive CSA polices across the three counties. Further the project facilitated the development and dissemination of CSA gender mainstreaming across the three counties. The support accorded to the counties by the project in facilitating policy development led to development of policies and positive shifts in budget allocations. In Laikipia, the project supported the development of the Laikipia Rangeland Management policy, Climate Change Act, and Climate change adaptation plan. Moreover, the support led to establishment of the CSA unit in the Department of Livestock and Fisheries (DALF) and the Socioeconomic Thematic Working Group (TWG). In West Pokot, the project supported the development of the Climate Change Bill, Gender Policy, the Youth Policy draft, establishment of the Gender and 3 radio station gender policies. In Kitui, the project supported the development of the Climate Change Policy, Gender policy draft, and the climate change adaptation plan and a radio station gender policy. It also supported the establishment of a Women socioeconomic empowerment unit in the county.

A change in behavioral aspect was notable as women capacity building on leadership and gender advocacy empowered them to actively participate in the development of county planning frameworks such as the County Integrated Development Plans (CIDP) III, Annual Development Report (ADP), and budget making process. The 4th Annual donor report in 2023 corroborates the notable increase in women's active participation in governance processes such as presenting petitions that advocate for resource allocation towards gender responsive CSA initiatives at the county level. Their participation led to increased uptake of women related projects and resulted in increased financial allocation towards CSA technologies by counties and as well, through advocacy on gender, women were empowered to voice against harmful gender practices within their communities.

The counties also increased their budget allocations towards gender and climate-smart agriculture activities. For example, Kitui County increased allocation on CSA from KES 58.5 million in 2023/2024 to KSH 95.8 million and allocation to Gender department from KSH 6 million to KES13.1 million in 2024/2025. In West Pokot County, the county government increased the allocation to CSA from KES 107 million in 2023/2024 to KES 423 million in 2024/2025 and increased the allocation to Gender department from KES 97 million in 2023/2024 to KSH 149.6 million in 2024/2025 (Table 6).

Table 6: County Allocations towards CSA and Gender related Activities

Financial Allocation	CSA tech 2023/2024	CSA tech 2024/2025	Dept. Gender 2023/2024	Dept Gender 2024/2025
Kitui	58.5m	95.8m	6m	13.1m
West Pokot	-	432M	21m	149.6m

PROPORTION OF FARMERS UTILIZING CSA TECHNOLOGIES AND PRACTICES

The project targeted to train 30 extension agents (the county governments, civil society, and lead farmers) on gender responsive CSA practices. In addition, the project trained farmer groups on gender responsive crop production and CSA good practices (through exchange visits and market access) with a view to increase the proportion of farmers utilizing CSA technologies. These trainings and capacity building spurred increased adoption of Climate-smart Agriculture practices and technologies. Although there was no significant increase between the baseline and end-line, the proportion of beneficiaries who adopted CSA technologies and practices marginally increased from 70% to 73% while it declined from 40% to 28% for the comparison groups to 28% (Table 7).

Finding 2: The proportion of farmers utilizing Climate-smart Agriculture technologies and the number of improved practices CSA increased.

Table 7: Proportion of farmers utilizing CSA technologies Baseline 2022 and End-line 2024

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Beneficiaries								
Kitui	109	109	91%	90%	0.01	0.04	0.250	0.820
Laikipia	135	134	70%	75%	-0.05	0.06	-0.900	0.362
West Pokot	82	83	43%	48%	-0.06	0.08	-0.700	0.480
All Counties	326	326	70%	73%	-0.03	0.04	-0.850	0.387
Comparison								
Kitui	54	54	70%	46%	0.24	0.09	2.600	0.011
Laikipia	50	51	50%	39%	0.11	0.10	1.100	0.281
West Pokot	62	61	7%	3%	0.03	0.04	0.800	0.417
All Counties	166	166	40%	28%	0.12	0.05	2.300	0.021
Beneficiaries								
HH with members living with disability	53	50	81%	72%	0.09	0.08	1.100	0.280
HH without members living with disability	273	276	68%	73%	-0.05	0.04	-1.400	0.165
***p<0.01; **p<0.05; *p<0.1								

The decline in proportion of those utilizing CSA in the comparison group proved that communities need support to continue using the technologies. Most probably, support in market linkages associated with the particular technology. As such, perhaps WEE-CSA interventions propped the beneficiary group to continue making use of the technologies compared to the unsupported comparison group. Although the survey did not establish the reason behind the high adoption at the baseline, the high rates can be attributed to perhaps earlier projects or the natural drive for farmers in the ASALs to practice climate-smart technologies.

Finding 3: Finding: Diversification of CSA technologies was higher in PLWDs than non-PLWDs

WEE-CSA promoted several CSA practices and technologies for adoption by the farmers. Farmers would adopt these based on their own context. Adoption of a number of technologies and/or practices would diversify farmers' approach towards combating negative climate change effects. An evaluation of the number of technologies or practices adopted by the farmers reveals a significant increase in the average number of technologies from 6 to 9 between the baseline and end-line (Table 8).

The increase was experienced across the counties (Kitui, Laikipia and West Pokot) in which the WEE-CSA project was implemented. The diversification in technologies was higher for households with members Living with Disability compared to those without.

Table 8: Number of CSA technologies by farmers Baseline 2022 and End-line 2024

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Beneficiaries								
Kitui	109	109	7	12	-4.825	0.52	-9.25	0.000***
Laikipia	135	134	6	7	-1.367	0.511	-2.7	0.008***
West Pokot	82	83	5	8	-3.086	0.68	-4.55	0.000***
All Counties	326	326	6	9	-2.957	0.346	-8.55	0.000***
Comparison								
Kitui	54	54	5	4	1.500	0.808	1.85	0.066*
Laikipia	50	51	3	5	-1.347	0.848	-1.6	0.116
West Pokot	62	61	0	0	-0.136	0.17	-0.8	0.426
All Counties	166	166	3	3	0.006	0.429	0	0.989
Beneficiaries								
HH with members living with disability	53	50	5	9	-3.925	0.85	-4.6	0.000***
HH without members living with disability	273	276	6	9	-2.772	0.379	-7.3	0.000***

***p<0.01; **p<0.05; *p<0.1

PROPORTION OF WOMEN BENEFITTING FROM WATER HARVESTING STRUCTURES

Finding 4: The project contributed towards increasing water access to women through promoting the use of climate-smart resilient structures.

Water scarcity is among the prevalent challenges in the arid and semi-arid areas in which the WEE-CSA project was implemented. Households spend considerable time and resources to get enough water for domestic consumption and other purposes. WEE-CSA promoted several water structures (Zai pits, sunken beds, moist beds, water pans, storage tanks, semi-circular ponds, farm-ponds and shallow wells). These enhanced access to water or conserved water for domestic use and small-scale irrigation. The proportion of women benefiting from these technologies, that is, those using water from these CSA technologies increased from 59% to 85% for the beneficiaries and marginally from 45% to 51% for the comparison group (Table 9).

Table 9: Proportion of women benefiting from water harvesting structures

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Beneficiaries								
Kitui	97	96	64%	93%	-0.288	0.056	-5.15	0.000***
Laikipia	121	119	77%	90%	-0.131	0.048	-2.75	0.007***
West Pokot	70	72	20%	65%	-0.453	0.183	-2.5	0.015**
All Counties	288	287	59%	85%	-0.26	0.055	-4.7	0.000***
Comparison								
Kitui	48	48	46%	77%	-0.313	0.095	-3.3	0.002***
Laikipia	39	40	90%	88%	0.022	0.072	0.3	0.757
West Pokot	54	54	11%	0%	0.111	0.043	2.55	0.013**
All Counties	141	142	45%	51%	-0.06	0.06	-1	0.312
Beneficiaries								
HH with members living with disability	53	50	70%	80%	-0.102	0.086	-1.2	0.237
HH without members living with disability	273	276	56%	84%	-0.28	0.057	-4.9	0.000***
***p<0.01; **p<0.05; *p<0.1								

PROPORTION OF WOMEN TRAINED ON CSA FINANCIAL SERVICES

The WEE-CSA project developed financial intermediary services to provide affordable plans to farmers and also trained women farmer groups on financial literacy. The proportion of women trained on financial literacy rose from 58% to 64% between the baseline and end-line.

Significant increase in the proportion of women trained on financial literacy was realized in Kitui with the proportion increasing significantly from 70% to 81% (Table 10).

Table 10: Proportion of women trained on financial Services

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Beneficiaries								
Kitui	97	96	70%	81%	-0.112	0.061	-1.8	0.072*
Laikipia	121	119	39%	45%	-0.057	0.064	-0.9	0.373
West Pokot	70	72	73%	74%	-0.007	0.075	-0.1	0.920
All Counties	288	287	58%	64%	-0.065	0.041	-1.6	0.112
Comparison								
Kitui	48	48	52%	40%	0.125	0.102	1.25	0.224
Laikipia	39	40	26%	8%	0.181	0.083	2.2	0.032**
West Pokot	54	54	9%	9%	0	0.057	0	1.000
All Counties	141	142	28%	19%	0.094	0.051	1.85	0.065*
Beneficiaries								
HH with members living with disability	53	50	55%	60%	-0.053	0.099	-0.55	0.592
HH without members living with disability	273	276	58%	66%	-0.081	0.042	-1.95	0.052*

***p<0.01; **p<0.05; *p<0.1

Finding 5: The project contributed to enhanced financial access through capacity building of women to use Village Savings and Loans Associations (VSLAs)

Key informant and focus group discussions revealed that through the capacity building, women received from WEE-CSA project, they were able to shift from merry-go-round to Village Savings and Loans Associations (VSLAs). VSLAs provide a continuous informal financial access through small loans to the group members unlike merry-go-rounds and enabled women investments in CSA. This implied that more women in the beneficiary groups could access financial services compared to the comparison groups.

PROPORTION OF WOMEN PARTICIPATING IN DEVELOPMENT AND IMPLEMENTATION OF CSA

Finding 6: The project contributed towards increasing women participation in climate change agenda by increasing women participation in the implementation of climate-smart agricultural technologies.

The trainings on climate-smart agriculture and how to implement the practices saw many women adopt the technologies thus contributing positively to the climate change agenda. The proportion of women participating in the development and implementation of CSA more than doubled from 8% in 2020 to 16% in 2024 driven largely by the increase in Kitui where the proportion increased from 2% to 24% over the project implementation period (Table 11).

Annex 2Table 11: Proportion of women implementing CSA.

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Beneficiaries								
Kitui	97	96	2%	24%	-0.219	0.046	-4.75	0.000***
Laikipia	121	119	7%	9%	-0.018	0.036	-0.5	0.615
West Pokot	70	72	16%	18%	-0.024	0.064	-0.35	0.712
All Counties	288	287	8%	16%	-0.088	0.027	-3.25	0.001***
Comparison								
Kitui	48	48	0%	15%	-0.146	0.052	-2.85	0.007***
Laikipia	39	40	8%	13%	-0.048	0.069	-0.7	0.484
West Pokot	54	54	4%	2%	0.018	0.032	0.6	0.563
All Counties	141	142	4%	9%	-0.056	0.029	-1.95	0.053
Beneficiaries								
HH with members living with disability	53	50	8%	18%	-0.105	0.066	-1.6	0.117
HH without members living with disability	273	276	8%	18%	-0.097	0.029	-3.4	0.001***
***p<0.01; **p<0.05; *p<0.1								

Although there were increases in the proportion of women participating in the development and implementation of CSA in other counties, they were not significant. Increase was also realized in the comparison group but was only significant in Kitui County and this could be attributed to other projects in the comparison wards (Annex 2).

PROPORTION OF WOMEN INVESTING AND PARTICIPATING IN CSA

Finding 7: Although the project contributed towards increased investment in CSA by women, there is still room to expand the investments. Only 20% (n=288) up from 13% (n=287) invested in CSA

The project conducted an awareness-raising campaigns through focus groups to community and county policy makers on gender in CSA. These awareness campaigns incentivized women to invest in CSA strategies including kitchen and vertical gardening to produce for home consumption and surplus for the market. Coupled with increased awareness on financial services access, these campaigns led to increases in the proportion of women investing in climate-smart agriculture from 13% to 20% between the baseline and end-line respectively, although the increase was not significant. Investments in CSA are important to sustain the impact against the negative effects of climate change. However, the culture towards investment on climate mitigation practices appear not to have spread across the counties except in Kitui where the change in proportion of women investing in CSA increased significantly from 2% in the baseline to 20% at the end-line (Table 12).

A discussion with groups indicated that the investments in CSA were financed through table banking within the groups. Group members borrowed to invest in CSA. Although a very small proportion of the beneficiaries indicated to have borrowed and invested in CSA, the focus group discussion revealed that table banking was a revelation from the old merry-go-round since it enabled them to borrow with ease.

Table 12: Proportion of women participating and investing in CSA

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Beneficiaries								
Kitui	97	96	2%	20%	-0.177	0.055	-3.25	0.002**
Laikipia	121	119	8%	6%	0.024	0.033	0.7	0.474
West Pokot	70	72	37%	45%	-0.073	0.142	-0.5	0.607
All Counties	288	287	13%	20%	-0.07	0.044	-1.6	0.107
Comparison								
Kitui	48	48	0%	4%	-0.042	0.029	-1.45	0.16
Laikipia	39	40	3%	10%	-0.074	0.065	-1.15	0.259
West Pokot	54	54	6%	4%	0.018	0.056	0.35	0.739
All Counties	141	142	3%	6%	-0.028	0.03	-0.95	0.346
Beneficiaries								
HH with members living with disability	53	50	4%	16%	-0.123	0.076	-1.6	0.113

HH without members living with disability	273	276	16%	23%	-0.067	0.049	-1.4	0.166
***p<0.01; **p<0.05; *p<0.1								

PROPORTION OF WOMEN WITH LEADERSHIP SKILLS TO PARTICIPATE IN CSA AND CCA DECISION MAKING

Finding 8: the project capacity build women on leadership skills thus contributing to increased participation of women in Climate Change Action (CCA) and Climate-smart Agriculture decision making, County Integrated Development Programs (CIDPs) and Annual Development programs (ADPs).

Leadership skills are important in driving the adoption of climate-smart technologies and in participation in decision-making processes. Capacity building on leadership gave women a position to drive their CSA agenda on their own without leadership from men. An index computed from sum of the participants in CCA and CSA decision-making conditional on that they were trained on leadership skills was generated and recoded to a dummy of 1 and 0. Using this index, an examination of the proportion of women with leadership skills that enabled them to participate in CSA and CCA decision-making shows that the gains were more pronounced in Kitui County (3%; n=68 to 36%; n=91) over the implementation period, and this drove the observed general proportionate increase from 12% (n=162) in the baseline to 28% (n=219) in the end-line for the beneficiaries (**Error! Reference source not found.**). This increase in the proportion of the women with leadership and decision-making skills is attributed to the training and capacity building by the project. Reportedly, the project trained more than 960 women on leadership skills to participate in CSA and CCA decision-making processes improving their skills in leadership and in decision making.

Similarly, there was an increase in the proportion of women with leadership skills in the comparison groups with the proportion increasing from 9% (n=54%) in the baseline to 23% (n=35) at the end-line. These shifts in women with leadership and also participating in CSA and CCA decision-making was perhaps driven by the county support to public participation and leadership aspects that were rolled out and continue to be practiced after devolution. Women in many parts have come out in the forefront of public participation and capacity building in leadership since devolution in 2013. Discussions with key informants and focus groups corroborate the quantitative findings that women participation in decision-making on CCA and CSA increased due to building of capacity on leadership skills. Increasingly, key informants from the county reported increased participation of women in public participation forums with contributions towards County Integrated Development Plans (CIDPs) and Annual Development Plans (ADPs) in the administrative wards where the WEE-CSA project operated unlike in those other wards. The outcome of the increased women participation in decision-making forums saw the increase in budgetary allocation by some of the counties towards gender related issues and climate-smart agriculture.

Table 13: Proportion of women with leadership skills to participate in CSA and CCA

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Beneficiaries								
Kitui	68	91	3%	36%	-0.333	0.055	-6.1	0.000***
Laikipia	47	63	17%	21%	-0.036	0.075	-0.5	0.634
West Pokot	47	65	19%	25%	-0.055	0.079	-0.7	0.491
All Counties	162	219	12%	28%	-0.166	0.04	-4.2	0.000***
Comparison								
Kitui	26	16	4%	13%	-0.087	0.094	-0.9	0.366
Laikipia	20	15	20%	40%	-0.2	0.16	-1.25	0.222
West Pokot	8	4	0%	0%	0	0	.	.
All Counties	54	35	9%	23%	-0.136	0.083	-1.65	0.104
Beneficiaries								
HH with members living with disability	53	50	10%	24%	-0.145	0.073	-2	0.050**
HH without members living with disability	273	276	11%	24%	-0.133	0.032	-4.15	0.000***
***p<0.01; **p<0.05; *p<0.1								

PROPORTION OF WOMEN ENGAGED IN AGRO-ENTERPRISES

In order to encourage women's engagement in agro-enterprises, the WEE-CSA project provided small grants and varieties of certified drought-tolerant crops and high-value vegetable seeds to offset the initial costs and barriers that bar women from engagement in agro-enterprises. These interventions contributed towards increased engagement of women in agro-enterprise. The engagement in agro-enterprises was computed as participation in selling of any of the products of the products or produce from the crops or livestock-oriented value chains. The proportion of women engaged in agro-enterprises increased from 45% to 59% between 2020 and 2024 following the interventions by WEE-CSA (**Error! Reference source not found.**).

Finding 9: The project contributed towards increased engaged of women in agro-enterprises increased from 45%(n=288) to 59%(n=287)

The index developed revealed an increase in the proportion of women engaged in agro-enterprises increased significantly from 45% in the baseline to 59% in the end-line while the comparison group did not show any significant increase. This shows that the WEE-CSA interventions on capacity building commercialization had a positive effect on women participation in crop and livestock enterprises.

Table 14: Women engagement in agro-enterprises between Baseline 2022 and End-line 2024

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Beneficiaries								
Kitui	97	96	69%	84%	-0.153	0.06	-2.55	0.012**
Laikipia	121	119	46%	52%	-0.058	0.065	-0.9	0.370
West Pokot	70	72	7%	35%	-0.276	0.065	-4.3	0.000***
All Counties	288	287	45%	59%	-0.141	0.042	-3.4	0.001***
Comparison								
Kitui	48	48	88%	85%	0.021	0.071	0.3	0.768
Laikipia	39	40	67%	50%	0.167	0.111	1.5	0.137
West Pokot	54	54	9%	22%	-0.13	0.095	-1.35	0.177
All Counties	141	142	52%	51%	0.004	0.065	0.05	0.955
Beneficiaries								
HH with members living with disability	53	50	49%	58%	-0.089	0.099	-0.9	0.368
HH without members living with disability	273	276	43%	61%	-0.173	0.042	-4.1	0.000***
***p<0.01; **p<0.05; *p<0.1								

PROPORTION WOMEN GROUPS AGGREGATING PRODUCE ALONG THE VALUE CHAIN

Table 15 shows the proportion of women in aggregating agricultural produce for marketing. Aggregation of produce enabled value chain actors to gain through economies of scale. At the beginning of the WEE-CSA, the proportion of women who were aggregating produce were estimated to be 36% in all the three counties.

Table 15: Proportion of women aggregating produce along the value chain

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Beneficiaries								
Kitui	97	96	35%	85%	-0.504	0.06	-8.3	0.000***
Laikipia	121	119	41%	30%	0.111	0.061	1.8	0.074*
West Pokot	70	72	27%	58%	-0.312	0.08	-3.95	0.000***
All Counties	288	287	36%	56%	-0.2	0.041	-4.9	0.000***
Comparison								
Kitui	48	48	31%	46%	-0.146	0.1	-1.45	0.145
Laikipia	39	40	15%	30%	-0.146	0.094	-1.55	0.124
West Pokot	54	54	26%	72%	-0.463	0.086	-5.4	0.000***
All Counties	141	142	25%	51%	-0.266	0.056	-4.75	0.000***
Beneficiaries								

HH with members living with disability	53	50	43%	54%	-0.106	0.099	-1.05	0.287
HH without members living with disability	273	276	35%	55%	-0.203	0.042	-4.85	0.000***
***p<0.01; **p<0.05; *p<0.1								

This proportion increased significantly to 56% by the end of the project. The increase in proportion of women aggregating along the value chains was realized across the three counties with significant increases in the proportion of women in Kitui (35% to 85%) and West Pokot (27% to 58%) but the proportion declined in Laikipia from 41% to 30%.

Finding 10: The project build women skills in aggregation of produce and thus gaining through scale economies.

The farmer groups could partially attribute the decline in Laikipia to changes in the IP that may have slowed the uptake of the concept. Increases in proportion of aggregation was also realized in the comparison groups especially in West Pokot County where the proportion increased from 25% to 51% over the project period. This could be attributed to the effect of other programs in the county including KCEP-CRAL, KCSAP and NARIG among others that were being implemented in the comparison wards (Annex 2).

PROPORTION OF PEOPLE REACHED BY GENDER MAINSTREAMING MESSAGES

Finding 11: the project contributed to gender mainstreaming as the proportion of women reached by gender mainstreaming message increased from 27% (n=326) to 57%(n=326)

WEE-CSA facilitated media advocacy campaigns, using local radio, barazas and churches around gender roles and the value addition of women in CSA . This entailed use of short messages about issues that affect women and girls and prevent them from participating an agricultural production and adoption climate-smart practices and technologies. By the 4th year of implementation, the project had 8 radio programs on women investing and participating in CSA as well as supported 4 radio stations with gender policy.

The gains of these engagement were realized as the proportion of people who received the gender mainstreaming messages increased significantly from 27% at the baseline to 57% at the end-line (Table 16). The proportion of women who received gender mainstreaming messages increased in the three beneficiary counties. In Kitui and West Pokot Counties, the proportion increased significantly from 13% (n=109) to 72% (n=109) and from 52% (n=82) to 82% (n=83) respectively. Although the proportion increased in Laikipia from 24% (n=135) to 28% (n=134), it was not significant and this was associated to the fact that the change in IP in Laikipia county affected the implementation of activities slowing them . down.

The increase in proportion of women reached by gender mainstreaming message also increased in the comparison groups. Like in the beneficiary group, it increased significantly in the comparison groups in Kitui and West Pokot but not significant in Laikipia. The increase in proportion of people in the comparison group could be attributed to positive spillover effect because the mode of delivery. Messages were broadcasted through local vernacular radio stations. The radio communication is not limited to the project area and could be listened in other areas and this could have contributed to the increase noted in the comparison group. .

Table 16: Proportion of women reached by gender mainstreaming message

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Beneficiaries								
Kitui	109	109	13%	72%	-0.587	0.054	-10.85	0.000***
Laikipia	135	134	24%	28%	-0.047	0.053	-0.85	0.387
West Pokot	82	83	52%	82%	-0.295	0.07	-4.2	0.000***
All Counties	326	326	27%	57%	-0.291	0.037	-7.9	0.000***
Comparison								
Kitui	54	54	2%	33%	-0.315	0.068	-4.65	0.000***
Laikipia	50	51	26%	28%	-0.015	0.089	-0.15	0.871
West Pokot	62	61	3%	28%	-0.247	0.062	-3.95	0.000***
All Counties	166	166	10%	30%	-0.199	0.043	-4.7	0.000***

Beneficiaries								
HH with members living with disability	53	50	21%	54%	-0.333	0.09	-3.65	0.001***
HH without members living with disability	273	276	29%	57%	-0.283	0.041	-7	0.000***
***p<0.01; **p<0.05; *p<0.1								

4.2. OUTCOME INDICATORS

The outcome variables are results of the output variables. Outcome indicators included the area under CSA, productivity in the targeted value chains, women empowerment, household income and poverty, food security and household resilience to climate change and food security. For instance, an increase in the proportion of farmers utilizing CSA technologies is expected to lead to expansion of the area under CSA. Similarly, the increase in the proportion of women investing and participating in CSA would also be associated with the increase in the area under CSA. The county level interventions resulted in developed policies and other strategic frameworks and culminated into increased allocation towards gender and/or climate-smart agriculture.

Adaptability to climate change influences agricultural production especially in Arid and Semi-Arid areas. As such, adoption of CSA technologies and practices would spur agricultural productivity for the targeted value chains. Further, with increased crop and livestock productivity, more produce would have resulted in surplus for the market thus strengthening the household food security position. The increase in the proportion of women engaged in agro-enterprises, proportion reached by gender mainstreaming messages, women benefiting from water harvesting, proportion of women trained in CSA and investing in CSA and aggregating produce along the value chains contributed into building the economic power of women. The cause effect chain was expected to reach higher-level outcomes including household food security, and household resilience to climate change and food security.

AREA (ACRES) OF FARMLAND UNDER CSA

Finding 12: The project contributed to expansion of the area under climate-smart technologies with hectarage increasing from an average of 0.22Ha to 0.34Ha per household. However, expansion may have been limited to adopt land extensive technologies such as tree vegetation and water pans by the small size if land that the households own.

The proportion of farmers using CSA increased marginally over the period of implementation from 70% (n=326) to 73% (n=326) in 2024 with the number of crops and livestock practices utilized by farmers increasing from 6 to 9 in number. This increase was driven by the trainings and capacity building which enabled farmers to understand the techniques of CSA. Moreover, farmer access CSA was bolstered by the access to small grands and varieties of certified drought tolerant crops and high-value vegetable seeds provided by the project.

With the increase in the proportion of farmers using CSA and in the number of CSA being utilized, the average area (Ha) per household put under climate-smart technologies increased from 0.22Ha to 0.34Ha (Table 17), a 51% increase, for the beneficiaries of the project between 2020 and 2024. However, the changes realized in the area under CSA vary from county to county with a decrease in Laikipia.

Table 17: Acreage under Climate-smart Agriculture Technologies

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Beneficiaries								
Kitui	109	109	0.57	0.91	-0.336	0.1	-3.4	0.001***
Laikipia	135	134	0.04	0.02	0.022	0.012	1.95	0.055**
West Pokot	82	83	0.06	0.10	-0.044	0.031	-1.4	0.162
All Counties	326	326	0.22	0.34	-0.115	0.044	-2.65	0.009***
Comparison								
Kitui	54	54	0.50	0.46	0.038	0.149	0.25	0.798
Laikipia	50	51	0.02	0.01	0.004	0.009	0.4	0.699
West Pokot	62	61	0.00	0.00	0.004	0.002	1.5	0.14
All Counties	166	166	0.17	0.15	0.015	0.054	0.25	0.786

Beneficiaries								
HH with members living with disability	53	50	0.36	0.39	-0.027	0.143	-0.2	0.85
HH without members living with disability	273	276	0.20	0.33	-0.132	0.044	-3	0.003***
***p<0.01; **p<0.05; *p<0.1								

A disaggregation of the area under technology shows a number of technologies declined in the area under which they were being practiced. In Laikipia County, 6 technologies including - Zai pits, sunken beds, moist beds, tree vegetation, drip irrigation and water pans declined in acreage. In Kitui county, 2 technologies- grass strips and water pans declined in acreage between the baseline and end-line while in West Pokot, 3 technologies - Zai pits, sunken beds, moist beds, declined in acreage covered.

The decline could be attributed to several factors. One, the IP change in the middle of implementation process may have affected the capacity building of the groups in adopting the CSA technologies and practices. Two, the size of land owned per household is small in Laikipia (2.2 acres) compared to Kitui (7 acres) and West Pokot (6.2 acres). Thirdly, there is a high and positive correlation between the acreage under CSA and the acreage of land cultivated or owned by the household. With households owning small pieces of land, their room for expansion is limited by the absolute size of the land.

On the other hand, the area decreased for the comparison group, although marginally, from 0.17Ha to 0.15Ha, a 9% decline in area. The total area under CSA increased by 51%, from 73 Ha at baseline to 110 Ha at end-line reflecting increasing adoption of climate-smart agriculture especially those that require land to be implemented.

PRODUCTIVITY IN CROPS, LIVESTOCK AND LIVESTOCK PRODUCTS

Finding 13: The project had mixed contribution to the productivity. In crops, the project significantly increased productivity for beans while increases for green grams, potatoes and vegetables were not significant. For livestock, number of dorpers declined while meat goats and poultry increased

The WEE CSA focused on several value chains including beans, bulb onions, fodder and pastures, green grams, potatoes, and vegetables. The livestock value chains include dairy goat, meat goat (Galla goat), doper sheep, poultry, and honey. Livestock products include dairy goat milk, and eggs. The project promoted agriculture and livestock productivity enhancement through several means, amongst them, drought tolerant seeds, kitchen gardens, pasture development, training and capacity enhancement in husbandry practices.

Over the four years of implementation of WEE-CSA, its interventions led to improvement in beans productivity from 0.2 Tons/Ha to 0.4 Tons/Ha, green grams productivity from 0.26 Tons/Ha to 0.39 Tons/Ha and vegetables from 3.4 Tons/Ha to 5.8 Tons/Ha (Table 18). The average number of chickens owned per household increase from 32 in 2020 to 232 in 2024 while the average number of dairy goats from an average of 3 to 10 per household, and meat goats from 11 to 18. Honey production increased from 11 Kgs/beehive/year in 2020 to 12 Kgs/beehive/year in 2023.On the other hand, the doper and milk productivity declined over the project time. One of the reasons obtained from Focus Group Discussions (FGD) was that of adaptation to the climate once the dopers were handed over to the groups coupled with limited veterinary support at times. A few of the dopers given to the groups have died. On the milk from the dairy goat, the productivity reflects that the seasonality, adaptation as well as the delayed delivery of dairy goats by the project. At the time of the evaluation, most of the dairy goats had not yet started yielding milk.

Table 18: Productivity in Crop, Livestock and Livestock products

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Beans	15	25	0.21	0.43	-0.21	0.082	-2.6	0.014*
Onions	20	17	4.72	3.62	1.09	1.39	0.8	0.439
Fodder	1	1	0.01	0.22	-0.21	.	.	.
Green Grams	19	34	0.26	0.39	-0.13	0.099	-1.3	0.209
Potatoes	6	18	1.70	1.85	-0.16	0.614	-0.25	0.805
Dairy goat	8	37	3	10	-6.77	2.377	-2.85	0.007**

Vegetables	6	19	3.4	5.8	-2.41	2.958	-0.8	0.424
Milk	8	15	168	95	72.58	49.524	1.45	0.158
Doper	6	11	39	15	23.89	6.453	3.7	0.009**
Meat goat	17	40	11	21	-9.26	3.163	-2.95	0.007**
Poultry	88	98	32	232	-200.2	40.196	-5	0.000***
Eggs	24	32	1,931	9,445	(7,514)	4,956	-1.5	0.140
Honey	4	22	11	12	-1.62	7.064	-0.25	0.827

***p<0.01; **p<0.05; *p<0.1

HOUSEHOLD INCOME AND POVERTY

Finding 14: The project led to increase in household income. However, the increase in income was not sufficient to pull the beneficiaries from the poverty depth and varied across the counties with increases in Laikipia and West Pokot and a decline in Kitui county.

The annual income per household increased by 36% from KES 92,543 ($ 718) to KES 131,790 ($ 1,014). An estimated 62% reported a positive income increase between the baseline and end-line. However, the overall annual income masks variations across the counties with a decline in household average income in Kitui and an increase in Laikipia and West Pokot Counties (Table 19).

Table 19: Household income between Baseline 2022 and End-line 2024

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Beneficiaries								
Kitui	109	109	109,752	82,807	26,945	12,916	2.1	0.038**
Laikipia	135	134	80,719	149,069	-68,350	13,532	-5.05	0.000***
West Pokot	82	83	89,134	168,221	-79,087	18,001	-4.4	0.000***
All Counties	326	326	92,543	131,790	-39,247	8,641	-4.55	0.000***
Comparison								
Kitui	54	54	139,556	86,143	53,412	18,590	2.85	0.005**
Laikipia	50	51	89,844	173,907	-84,063	21,594	-3.9	0.000***
West Pokot	62	61	129,944	175,541	-45,597	31,767	-1.45	0.154
All Counties	166	166	120,992	145,958	-24,966	15,156	-1.65	0.101
Beneficiaries								
HH with members living with disability	53	50	90,038	132,856	(42,818)	23,994	-1.8	0.070*
HH without members living with disability	273	276	93,029	131,597	(38,568)	9,253	-4.15	0.000***

***p<0.01; **p<0.05; *p<0.1

In Kitui, while the proportion of households who generated income from crops marginally increased, those generating income from livestock and casual employment declined drastically with other sources such as rent, social security and remittances not contributing into the income basket by the end of the project implementation. The picture presents dwindling options for income sources in Kitui. Although there was no capture of the amount of income by source, the decline in proportion of those earning income from livestock outweighed the gains in crops, hence a decline in the absolute amount of income in Kitui County.

The increase in average household income was higher than that of the comparison group whose income increased by 19% over the period of project implementation. The value chain supported by WEE-CSA contributed 43% of the beneficiary's household annual average income compared to 31% for the comparison group. Comparing the PLWD and the non-PLWDs, a higher increase in annual household income was realized in households with people Living with Disability members where income increased by 52% (KES 90,038 ($692) to KES 130,447 ($ 1,022) compared to households without disabled members whose incomes increased by 33% (KES 93,029 ($716) to KES 131,598 ($1,012)). The change in annual household income was higher.

Finding 15: PLWDs gained income at higher rate than the non-PLWD

Households were asked about their annual expenditures on basic household needs – including food, health, school, rent, inputs to production and payment of loans and savings. Comparison between baseline and end-line reveals that the decline in income in Kitui orchestrated a decline in expenditures on food items but there was an increase in expenditures across all the other basic items. Household income and expenditures

are closely linked in a positive relationship. The decline of household income estimated to 29% between the baseline and end-line and triggered a decline of food expenditure to the tune of 53% in Kitui. In Laikipia and West Pokot, increase in household annual income led to increase in expenditures across all the items.

The annual total expenditure based on the above basic expenditures was estimated to KES 113,729 (USD 927) for the non-beneficiaries and KES 81,350 (USD 663) for beneficiaries at the end-line. Like the average annual income, the beneficiaries had a lower spending compared to the non-beneficiaries.

Using the expenditure as a measure to estimate the poverty incidence, the evaluation found that the gains on poverty made between 2020 and 2024 in the project area were on average positive with households who spend above KES 3,252 ($0.83 based on exchange rate ($:KES130 which is even far lower than the $1.25 poverty threshold) per month increasing from 7% to 11% in 2024 (Table 20). However, in Kitui, for instance, using the expenditure measure reveals that poverty incidence increased because households spend less on food, thus weighing them down the expenditure scale unlike in the other counties resulting into an increase in the proportion of households whose monthly expenditure was below the poverty cut-off. This happened for both beneficiary and comparison group.

Finding 16: Poverty declined faster in PLWDs compared to non-PLWDs

Table 20: Household Poverty

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Beneficiary group								
Kitui	109	109	15%	4%	0.11	4%	2.85	0.005***
Laikipia	135	134	5%	22%	-0.172	4%	-4.2	0.000***
West Pokot	82	83	1%	2%	-0.012	2%	-0.55	0.570
All Counties	326	326	7%	11%	-0.037	2%	-1.65	0.105
Comparison group								
Kitui	54	54	17%	9%	0.074	7%	1.15	0.256
Laikipia	50	51	8%	33%	-0.254	8%	-3.3	0.002***
West Pokot	62	61	5%	21%	-0.165	6%	-2.75	0.007***
All Counties	166	166	10%	21%	-0.115	4%	-2.9	0.004***
Beneficiary group								
HH with members living with disability	53	50	8%	16%	-0.085	6%	-1.3	0.190
HH without members living with disability	273	276	7%	10%	-0.028	2%	-1.15	0.243

***p<0.01; **p<0.05; *p<0.1

A higher rate of poverty decline was realized in households with disabled members than those without. The decline in food expenditure, may indicate that households were purchasing less given the harvest that may have resulted from the good rainfall season. The expenditure measure does not account for the food consumption from their own production and thus there is the possibility of classifying households as poor since they do not exhibit monetary expenditures.

HOUSEHOLD FOOD SECURITY

Finding 17: Food security improved following the project interventions. The severity of food insecurity declined with more households experiencing mild food insecurity than before.

In arid and semi-arid lands, food insecurity is a perennial menace driven by drought and other concomitant shocks such as markets. The WEE-CSA focus counties are prone to food insecurity. They are arid or semi-arid and characterized by small-scale farming. Drought and food insecurity are positively correlated and co-occur. A comparison of the Food Insecurity Experience Scale (FIES) between baseline and end-line reveals a change in the status of food insecurity experience throughout WEE-CSA implementation. The proportion of households experiencing both severe and moderate food insecurity declined from 83% to 65%, the severe category declined from 66% to 42%. The improvement in food security experience was reflected in the increase in the proportion of households with moderate experience from 17% to 23% and the increase in the proportion of those with mild experience from 18% to 35% (Table 21).

Table 21: Household Food Insecurity Experience (Food Insecurity Experience Scale (FIES))

Beneficiary group	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
FIES Scale-Mild	326	326	18%	35%	-0.17	0.03	-5.1	0.000***
FIES Scale Moderate	326	326	17%	23%	-0.07	0.03	-2.15	0.031**
FIES Scale -Severe	326	326	66%	42%	0.24	0.04	6.3	0.000***
FIES Scale -Moderate+Severe	326	326	83%	65%	0.17	0.03	5.1	0.000***
# of months HH has food shortage	325	326	5	2	2.68	0.19	14.05	0.000***
Comparison group								
FIES Scale-Mild	166	166	28%	23%	0.05	0.05	1.15	0.259
FIES Scale Moderate	166	166	12%	15%	-0.04	0.04	-0.95	0.333
FIES Scale -Severe	166	166	60%	62%	-0.02	0.05	-0.35	0.737
FIES Scale -Moderate+Severe	166	166	72%	77%	-0.05	0.05	-1.15	0.259
# of months HH has food shortage	166	166	4	3	1.15	0.28	4.05	0.000**
***p<0.01; **p<0.05; *p<0.1								

On the side of the comparison group which did not have these interventions, there were no significant changes over the same period of project implementation between 2020 and 2024. The food insecurity experience declined significantly in both households with and without disabled members.

In addition to the reduction in food insecurity experience, the months in which households faced food gaps declined on from an average of 5 months in 2020 to 2 months in 2024 within the year for the project beneficiaries while it declined from 4 months in 2020 to 3 months in 2024 for the comparison group. The decline in months in which households experienced food gaps was significant for both households with disabled members and those without.

RESILIENCE TO CLIMATE SHOCKS

Finding 18: Resilience to climate and economic shocks need to be built in order to protect the gains made on income, poverty and food security.

Resilience[11] programming was built within the adaptive and absorptive capacity as well as access to assets and infrastructure that confers basic services to the communities. Although the project empowered women economically, it failed to build the resilience of the household and as such, gains made on income and food security as well on gender were at risk of being eroded in the event of exogenous shocks (climate, economic, and market shocks).

The computed index of resilience to climate change reveals a decline between the baseline and end-line of WE-CSA. The resilience index declined from 34% to 31% for the beneficiaries and 40% to 39% for the comparison group. The decline was slightly higher for the families with disabled members (from 33% to 29%) compared to the families without disabled members (34% to 31%).

The failure of the project not to positively impact resilience hangs on the assets which have not yet started yielding returns because of two reasons. One, that most of the assets distributed line machines and equipment were not linked to entrepreneurial skills and delayed delivery. And two, that assets like livestock take longer beyond the project time to start yielding.

WOMEN ECONOMIC EMPOWERMENT

Finding 19: WEE-CSA economically empowered women by enabling them to participate in agro-enterprises, and adoption of CSA but still cultural attitudes and perceptions persist in some counties impairing the progress towards gender equality.

Empowerment of women was driven from several fronts. The project improved women's economic empowerment, with an increase in the proportion of households making decisions jointly than before and

[11] The computation of the resilience index to climate follows a well-documented process. According to Alinovi *et al.* (2010)[11], household resilience is a latent variable determined by the following fundamental pillars: social safety nets (SSN), access to basic services (ABS), adaptive capacity (AC), income, and food access (IFA), and Assets (A). The pillars of resilience are generated separately; different variables are aggregated to compute each pillar. $R = f(IFA, ABS, A\ SSN, AC)$.

with more women participating in county public development forums. In general, decision-making for the beneficiaries is increasingly shifting towards joint decision-making between the husband and wife compared to the time the project started. The proportion of households making decisions jointly or wife participating in the decision-making process increased from 64% to 71% throughout project implementation. The proportion of women practicing CSA doubled from 8% (n=288) to 16% (n=288) with the proportion of women investing in CSA increasing from 14% (n=288) to 20% (n-287) over the implementation period. Similarly, the proportion of women participating in Climate Change Action (CCA) also more than doubled from 11% (n=162) to 28% (n=219) in 2024. Moreover, those engaged in agro-enterprises also increased from 45% (n=288) to 59% (n=287) in 2024.

The index shows that the project effectively empowered women in Kitui and Laikipia County but not in West Pokot (Table 22).

Table 22: Women Economic Empowerment Index

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Beneficiary group								
Kitui	109	109	0.09	0.28	-0.19	0.02	-8.3	0.00***
Laikipia	135	134	0.09	0.12	-0.03	0.01	-2.35	0.02**
West Pokot	82	83	0.20	0.20	-0.01	0.06	-0.1	0.90
All Counties	326	326	0.12	0.19	-0.08	0.02	-4.3	0.00***
Comparison group								
Kitui	54	54	0.11	0.16	-0.05	0.02	-2.05	0.04**
Laikipia	50	51	0.09	0.12	-0.03	0.03	-1.05	0.31
West Pokot	62	61	0.06	0.06	0.00	0.03	0.15	0.90
All Counties	166	166	0.09	0.11	-0.02	0.02	-1.45	0.15
Beneficiary group								
HH with members living with disability	53	50	0.09	0.18	-0.10	0.04	-2.75	0.01**
HH without members living with disability	273	276	0.12	0.20	-0.07	0.02	-3.6	0.00***
***p<0.01; **p<0.05; *p<0.1								

A factor combination index used to measure women empowerment increased from 0.12 to 0.19 units (36% n=326) for the project beneficiaries and was higher compared to that of the comparison group which increased from 0.09 to 0.11 (19% n=166) between 2020 and 2024. In West Pokot County, further evidence from the examination of the practices that prevent women from being empowered compared to other counties include cultural attitudes and perceptions, limited access to land and capital were among the most important barriers towards economic empowerment. The increase in the index measure showed an enhanced position for women in decision-making and participation in community and government development activities as well as in markets. In households with disabled members, gain in empowerment was faster compared to the households where there were no or did not represent disability members.

4.3. DIFFERENCE IN DIFFERENCE MODEL RESULTS

AVERAGE TREATMENT EFFECT ON TREATED (ATET)

A Difference-in-Difference estimation was conducted on the set of project outcomes to generate the Average Treatment Effect on the Treated (ATET) of the project on the outcomes of interest. The outcomes included the area under CSA, productivity in the targeted value chains, household income, poverty, women's economic empowerment, food security (measured through the Food Insecurity Experience Scale (FIES), and household resilience to climate shocks and food insecurity. Equation 4 was log-transformed for area, productivity, and household income outcomes[12] but remained at level for the poverty, food insecurity, and resilience outcome indicators.

The DiD model was estimated after testing for assumptions detailed in section 3.2.2 including the parallel trends, stable unit treatment value (SUTVA), and exogeneity assumptions. While the SUTVA and exogeneity assumptions are intrinsically met in designing the study and in framing the equations, the

[12] The log transformed outcome variables and DID variable are log-linear models and the interpretation of the coefficients are multiplicative such that a unit change in the DID variable results into $(e^b - 1) * 100$ percentage change in the outcome variable

parallel trends were graphically tested (see Annex 7). The estimation was conducted using the diff command in STATA Version 14 software. The estimation of the standard errors was not clustered as there are only 17 wards covered within 3 counties. Clusters of less than 50 may compromise the cluster-robust inference. A DiD script is attached (Annex 12). Table 23 presents the ATET (Average Treatment Effect on Treated) or the quantified impact of WEE-CSA on various outcomes.

The area under Climate-smart Agriculture:

The area under agricultural or climate-smart technologies was used to demonstrate the intensity of adoption of the technology and capture acceptance and continued use of the technology. The project trained farmer groups on gender-responsive range rehabilitation and environmental conservation. As earlier estimated, the average area (Ha) per household put under climate-smart technologies increased from 0.22Ha to 0.34Ha. which was a 51% increase between the baseline and end-line for the beneficiaries.

The effect of the interventions led to a significant 10% ($p<0.05$) expansion of the area of land under climate-smart technologies. Zai Pits, terraces, and vertical gardens were among the widely adopted technologies that pushed outwards the area under CSA. With the WEE-CSA counties being susceptible to drought and having limited water sources, conservation of water through CSA was an important ingredient that extended the number of cropping seasons and reduced the risks associated with rain-fed agriculture and livestock rearing. The positive and significant finding that the area under CSA expanded significantly is thus attributed to the capacity building conducted under the WEE-CSA project.

Agriculture Productivity:

The project led to a 5.2% ($p<0.05$) increase in the productivity of potatoes, 76.8% ($p<0.05$) increase in poultry, 61% ($p<0.1$) increase in eggs per year, and 15% $p<0.01$) increase in honey productivity. This implies that the changes in productivity in potatoes, poultry, eggs and honey can be certainly attributed to the WEE-CSA project interventions. Productivity in agriculture and especially in the crops was contributed to by the expansion of area under CSA. Potatoes take a shorter time (3 months) to yield, and the effects of climate-smart technologies are realized in a shorter time. Similarly, poultry production takes short time and production of eggs may be realized in as short as 6 months. Honey production is seasonal and any improvement in the production technology can be realized in as short as six months. In a year, honey harvesting can take place twice following the short and long rains season. The time taken to realize the benefits of investing in a technology in an important incentive that encourages farmers to adopt technologies. Short-term yielding climate-smart technologies are more likely to be adopted than those that take a longer term to yield. However, productivity declined in green grams, and onions and did not increase significantly in beans, milk and meat. The decline in green grams is surprising bearing in mind that this is largely a crop produce from semi-arid Kitui County and it contributes considerably to household income beyond subsistence. We attribute the negative and significant impact on green grams to measurement error in farm areas under green grams and production quantities reported by the comparison group[13]. A closer examination of the data revealed glaring inconsistencies of area (drastic declines) and production quantities (drastic increase in production against reported area under cultivation) reported during the baseline and end-line by the comparison group. The decline in area reported and end-line by the comparison group overscored the productivity demeaning the gains by the beneficiary group and hence the negative impact. The insignificant change in meat and milk is attributed to the fact that the dairy goats offered to the groups have not yet started yielding to potential and that livestock normally takes longer to yield. Most of the groups were still in the process of raising the goats and the offspring. It is expected that milk and meat production will increase over time beyond the project.

Table 23: Difference in Difference Model results

	ATET (Diff-in-	Std Error	Mean Comparison t (0)	Mean Beneficiary t (0)	Diff t (0)	Mean Comparison t (1)	Mean Beneficiary t (1)	Diff t (1)

[13] The decrease Iin green grams was significant. The average area under green grams declined by almost 47% (by 1.47 Ha from 3.04Ha) per household in the comparison group far higher than the decline in the beneficiary group which declined by 17% (by 0.39Ha from 2.26Ha) for the beneficiaries between the baseline and end-line. Green gram production also was reportedly very high in the comparison group (from 0.04 tons- 0.36 tons) compared to very modest reported increase in the comparison group (from 0.32 tons to 0.37tons). Such resulted to very high gains in productivity in comparison groups outweighed the productivity gains in the beneficiary group.

	diff (n-984))							
Area (Ha) under CSA	0.0913**	-0.04	0.11	0.15	0.04	0.09	0.22	0.13
Beans (Tons/Ha)	0.00403	-0.01	0.1140	0.1510	0.0368	0.0882	0.2160	0.1280
Onions (Tons/Ha)	-0.0345	-0.04	0.0256	0.0084	-0.0172	0.0389	0.0257	-0.0132
Green grams (Tons/Ha)	-0.03**	-0.01	0.0000	0.0942	0.0942	0.0000	0.0598	0.0598
Potatoes (Tons/Ha)	0.0506**	-0.02	0.0018	0.0115	0.0097	0.0437	0.0234	-0.0203
Vegetables (Tons/Ha)	0.0774*	-0.04	0.0213	0.0164	-0.0049	0.0069	0.0526	0.0456
Milk- Liters/HH/Year	0.0944	-0.09	0.0614	0.0181	-0.0432	0.0401	0.0742	0.0342
Meat Goats (#/HH/year)	0.0181	-0.11	0.0386	0.1050	0.0662	0.0000	0.1610	0.1610
Poultry- (# per HH/year)	0.570**	-0.24	0.1840	0.1130	-0.0711	0.4110	0.3580	-0.0530
Eggs (# per HH/year)	0.477*	-0.26	0.9580	0.8410	-0.1170	0.8590	1.3120	0.4530
Honey (Kgs/hive/year)	0.136***	-0.05	0.6710	0.4980	-0.1730	0.3820	0.6860	0.3040
Poverty (>3,252/month/hh)	-0.0694	-0.04	0.1020	0.0708	-0.0310	0.2110	0.1100	-0.1000
FIES Mild	0.224***	-0.06	0.2810	0.1750	-0.1060	0.2290	0.3470	0.1180
FIES Moderate	0.0392	-0.05	0.1200	0.1630	0.0433	0.1510	0.2330	0.0825
FIES Severe	-0.263***	-0.07	0.5990	0.6620	0.0627	0.6200	0.4200	-0.2000
FIES Moderate+Severe	-0.224***	-0.06	0.7190	0.8250	0.1060	0.7710	0.6530	-0.1180
HH Income	0.384**	-0.17	11.2300	11.0100	-0.2190	11.2500	11.4100	0.1660
Resilience Index	-0.0216	-0.02	0.3930	0.3350	-0.0580	0.3870	0.3070	-0.0796
Women Economic Empowerment Index	0.0529**	-0.03	0.0871	0.1170	0.0300	0.1100	0.1930	0.0829

***p<0.01; **p<0.05; *p<0.1; Note- the productivity of potatoes and milk did not hold for parallel trends assumption.

Household income and poverty: The average treatment effect on the treated is positive and significant on the household income. The effect of the project on the income of the beneficiaries was a 47% increase in household income between the baseline and end-line. This income emanates from the surplus of produce sold from increased production from the focus value chains. The adoption of climate-smart agricultural technologies especially kitchen gardens resulted in surplus vegetables that women could sell and generated some income. Further, the production of vegetables enabled households to undertake savings thereby increasing their income level. Closely related to household income is household poverty. However, despite the WEE-CSA leading to an increase in income, it did not lead to a significant decline in poverty. This implies that the poverty level of the beneficiaries was so severe that the increase in income from the project could not overcome their depth of poverty.

Women's economic empowerment: Climate-smart technologies were used to enhance gender equity. The adoption of climate-smart technologies leads to increased productivity in agriculture value chains. With women's increased participation in the value chains as producers, farm laborers, processors, or traders, there is potential that women will be empowered to contribute towards meeting family expenditures and thereby strengthening their position in decision-making at the household level. Through the capacity building on financial literacy, women shifted from merry-go-round to table banking where they could save and borrow money driven by needs. These enabled women to lower climate risks by investing in climate-smart technologies, which would lead to increased agricultural productivity and income. The quantified impact of WEE-CSA on women's empowerment was found to be positive and significant with a 0.053 unit (or 48% better than for the comparison group) strengthening of the empowerment over the project implementation period. This positive effect is associated with increased participation of women in the targeted value chains and income that accrued from the value chains. Also, the project, through transfers of assets such as goats and agriculture productivity-enhancing machines, reduced the structural barriers and social norm constraints that impede women from using CSA technologies and participating in income generation activities including- owning assets, less access to land, agricultural inputs and social and institutional networks. Moreover, the capacity building on financial literacy and in crop and livestock husbandry practices also could have played a part in the strengthening.

Household Food Security: The use of CSA technologies implies increased agricultural productivity and consequently enhanced food security status. The impact pathway for WEE-CSA to household food security perhaps came through the empowered women. When women gain higher bargaining power at the household level, then they allocate more resources towards food security. The impact of WEE-CSA on food insecurity experience was significant with severe experience in food insecurity declining by 22% ($p<0.01$) or 46% decline in severe food insecurity experience compared to the comparison groups. The project had effects on the severe category implying that the poorest of the poor were targeted. On the other hand, this reduction in the severe category was reflected in the milk category as an increase in the proportion of those households experiencing mild food insecurity.

The shifts towards improved food security experiences can be associated with the WEE-CSA project interventions including kitchen gardens, which have enhanced access to vegetables at the household level and income generated from the surplus produce. The key informant and focus group discussions revealed the enhanced access to vegetables owing to kitchen gardens. The interventions have also led to the adoption of climate-smart practices and drought-tolerant crops such as green-grams. Evidence links adoption of stress-tolerant to improvement in dietary diversity and reduction of food insufficiency in households. Further, the higher the threats to food insecurity, the more likely that households will adopt CSA technologies.

Household resilience to food security and climate change impacts: there is a close linkage between climate-smart technologies and household resilience to climate change and food insecurity. The WEE-CSA impact on household resilience is negative but not significant. WEE-CSA did not strengthen the household's resilience throughout its implementation. This was attributed to the fact that households were still in the recovery phase from the previous drought incidences and that seemingly, the effects of drought seemed to override the effect of the elements that could build resilience from the project. By design, the project targeted the less resilient households. By the conclusion of the project, although both groups had weakened in terms of resilience, the beneficiary group had lost more of its resilience than the comparison group.

An estimation of the impact of WEE-CSA while controlling for county variation, participation in programs related to WEE-CSA, household size that connotes availability of farm labour, age of the group member, and groups with disability is presented in **Error! Reference source not found.**. The results compare well to those obtained when the covariates are not included and imply that the program's impact was not affected by the factors that differ across the beneficiaries and comparison groups.

THE IMPACT PATHWAY

To establish the impact pathway for the WEE-CSA project, the system of simultaneous equations (5-8) was estimated using a conditional mixed process (cmp) to address endogeneity. Table 25 presents the results of the 2-SLS estimation of the simultaneous system of equations. These results are proof of the theory of change that sought to empower women through climate-smart agriculture. Many factors, among them climate information access, size of land owned, access to extension information, and access to credit significantly influence the adoption of CSA technologies and practices.

- **Finding 20: Climate-smart agriculture has a positive influence on household income, which in turn positively empowers women, and women empowerment has a positive effect on household food security.**

We find that the level of adoption of climate-smart technologies had a positive and significant impact on household income. Household income positively and significantly strengthens women's economic empowerment, which also, shortens the number of months households experience food shortages. However, extension is surprisingly negative and significant. Such results may be driven by farmers needing to pay to access extension services.

Table 24: Difference in Difference Model results controlling for Heterogeneity

	ATET (Diff-in-diff (n-984))	Std Error	Mean Comparison t (0)	Mean Beneficiary t (0)	Diff t (0)	Mean Comparison t (1)	Mean Beneficiary t (1)	Diff t (1)
Area (Ha) under CSA	0.0887***	-0.03	0.38	0.42	0.04	0.36	0.48	0.13
Productivity								
Beans (Tons/Ha)	0.00401	-0.01	-0.07	-0.10	-0.02	-0.06	-0.08	-0.02
Onions (Tons/Ha)	-0.0342	-0.04	-0.06	0.05	0.12	-0.06	0.02	0.08
Green grams (Tons/Ha)	-0.0231**	-0.01	0.04	0.05	0.01	0.08	0.07	-0.01
Potatoes (Tons/Ha)	0.0522**	-0.02	0.08	0.07	-0.01	0.07	0.11	0.04
Vegetables (Tons/Ha)	0.0761*	-0.04	0.18	0.13	-0.04	0.16	0.19	0.03
Milk- Liters/HH/Year	0.0946	-0.09	-0.42	-0.37	0.05	-0.46	-0.32	0.14
Meat Goats (#/HH/year)	0.00617	-0.11	0.49	0.45	-0.04	0.73	0.70	-0.03
Poultry- (# per HH/year)	0.580**	-0.23	1.55	1.40	-0.15	1.43	1.86	0.43
Eggs (# per HH/year)	0.479*	-0.25	0.47	0.21	-0.25	0.17	0.40	0.23
Honey (Kgs/hive/year)	0.135***	-0.05	0.15	0.15	0.00	0.13	0.27	0.14
Poverty (>3,252/month/hh)	-0.0593	-0.04	0.75	0.70	-0.05	0.85	0.74	-0.11
FIES Mild	0.226***	-0.06	0.70	0.57	-0.12	0.64	0.75	0.11

FIES Moderate	0.0408	-0.05	0.14	0.18	0.04	0.17	0.25	0.08
FIES Severe	-0.267***	-0.06	0.16	0.25	0.08	0.18	0.00	-0.18
FIES Moderate + Severe	-0.226***	-0.06	0.30	0.43	0.12	0.36	0.25	-0.11
Months of food shortages	-1.538***	-0.33	3.70	4.31	0.60	2.58	1.64	-0.94
HH Income	0.375**	-0.17	10.86	10.65	-0.21	10.89	11.06	0.17
Resilience Index	-0.018	-0.02	0.37	0.32	-0.05	0.36	0.29	-0.07
Women Economic Empowerment Index	0.0526**	-0.03	0.15	0.18	0.04	0.17	0.26	0.09

***p<0.01; **p<0.05; *p<0.1

On the other hand, a 1% increase in household income results in an increase of 0.41 units of the women's economic empowerment index. This implies the indirect effect through increased crops and livestock production that result from the adoption of climate-smart technologies. In this case, extension plays a positive and significant role in terms of empowering women with critical crop and livestock husbandry practices.

An increase by one unit of the women empowerment index shortens the number of months of food shortages by 1.6 months. This is consistent with the thought that women play an important role in ensuring food security of the household. It implies that part of the income accrued from CSA in the hands of women is allocated towards meeting household food needs.

Finding 21: access to extension services, climate change information, market information, and credit positively influence the adoption of CSA. However, extension services have a negative effect on household income and credit services weaken women's economic empowerment.

Factors such as extension services complement the increase in income providing skills and techniques of production to the households. However, the purpose of credit access, although significant, affects food security negatively especially if the interest rates are high to erode the income gain from CSA adoption. The gains from CSA adoption are dependent on the market prices. So, to confer benefits to the adopters, the price increase should be higher than the interest rate of loans.

One of the notable aspects pertains to the consideration of group members either with or representing family members living with a disability. The effect of the variable representing disability is 0.17 and is significant. This reveals that group members Living with Disability or representing group members with disability gained relatively higher compared to the rest of the members. These results conform to the findings from focus group discussion results involving groups consisting of members living with disabilities that showed the commitment and enthusiasm of such groups to the cause of the WEE-CSA project.

4.1. GENDER EQUALITY AND HUMAN RIGHTS

Gender inequalities are a common phenomenon in Kenya and in particular the ASALs. Often, women have very low influence on decision-making on resource access and utilization. In the three counties where WEE-CSA was implemented, families are patriarchal, and men are considered the final decision-makers on resources and their use. The insights on gender transformation were synthesized from key informants comprising of focal point persons, County Executive Committee Members (CECMs), Directors in Agriculture and Gender departments at the county level, Training of Trainers, and Focus Groups (groups comprising of women, and men and youth) across the counties. Evidence revealed increased awareness to voice out concerns that affect women's participation in development activities. However, cultural attitudes and perceptions are still prevalent as indicated by survey results.

Table 25: Impact Pathway of Climate-smart Agriculture to Women Economic Empowerment.

	Adoption of CSA technologies and practices	**Annual household income**	**Women Economic Empowerment (WEI-CC Index)**	**Months of households have food shortage**
	Coef. (P>z)	Coef. (P>z)	Coef. (P>z)	Coef. (P>z)
Access to climate change information (1 Yes, 0 No)	0.329*** (0.000)			
Access to Market Information (1 Yes, 0 Not)	0.186*** (0.009)			
Log Land Size (Acre)	0.109*** (0.001)			
Adoption (Has at least some area of land put under one CSA technology)		**0.614** (0.011)**		

Household Annual Income			**0.412*** (0.004)**	
Women Economic Empowerment (WEI-CC Index)				**-1.57*** (0.002)**
PLDW (1=Yes, 0=No)				0.17** (0.017)
Age of head of household (Years)	3.43 (0.370)	4.44 (0.306)	-1.73 (0.350)	4.15* (0.073)
Squared Age of Household Head (years)	-0.38 (0.444)	-0.63 (0.260)	0.23 (0.347)	-0.56* (0.064)
Log Household size	-0.42*** (0.004)	0.36* (0.051)	-0.05 (0.372)	0.29*** (0.001)
Access to Extension services (1 Yes, 0 Not)	1.08*** (0.000)	-0.84** (0.016)	0.08* (0.067)	0.15** (0.040)
Access to Credit services (1 Yes, 0 Not)	0.21** (0.022)	0.15 (0.220)	-0.16*** (0.007)	-0.06 (0.241)
Log Distance to market (Km)	-0.57*** (0.000)	0.48** (0.016)	0.01 (0.841)	0.36*** (0.001)
Time (0 Baseline; 1 End-line)	-0.10 (0.290)	0.28** (0.006)	-0.02 (0.616)	-0.41*** (0.000)
Constant	-7.15 (0.329)	2.41 (0.773)	-1.07 (0.717)	-7.15 (0.107)

**** p<.01, ** p<.05, * p<.1 P-values in parenthesis*

Analysis from the survey data showed that attitudes and perceptions (19%, n=177); lack of access to land (15%, n=177), and financial capital (14%, n=177), which increasingly were reported at the end of the project unlike before the project were barriers to women empowerment. Other harmful practices that were found to impair women's economic empowerment included early marriages (3%, n=177) and illiteracy (9%, n=177). Cultural perceptions and attitudes, lack of capital, and limited access to land were more pronounced in West Pokot County than in any other. Compared to the end-line, a smaller proportion of respondents identified these as the barriers to women's participation in crop value chains. The identification of these types of gender biases at the end-line and their statistical significance implied that more women understood, identified, and voiced concerns regarding the aforementioned harmful practices and barriers to their empowerment.

Finding 22: Access to financial capital, early marriages, access to land, and illiteracy in the adults continue to prop gender inequalities more particularly in West Pokot County which showed a higher prevalence of the harmful practices compared to Kitui and Laikipia County.

From the assessment, there was a positive trend towards equality with the realization of increased women's participation in income generation activities along the targeted value chains, increased participation in decision-making at the household level, and increased participation in government decisions on development. It was notable that women were taking up transformative measures to combat climate change in the three counties. This followed the realization of gender roles in combating the negative effects of climate change.

- **Enhanced capacity, confidence, and courage to participate actively in discussions regarding development** – across the three counties, 12 out of 16 key informants and all the participants in the 7 FGDs revealed that after capacity building from the WEE-CSA project, women were actively participating in development forums- such as county public participation and voicing their views on development projects. This led to gender-responsive budgeting across the counties. In Kitui, a discussion with one key informant from the IP and one FGD revealed that participation of women in county government development discussions led to the establishment of Ikutha Children Centre, and numerous water boreholes were drilled in the area in addition to the county making the highest budgetary allocation towards gender-responsive projects. Such projects will unburden women from uneconomical engagement and the shortened distance and time taken in search of water was presumed spend on economic activities.
- **Shift in gender roles with women participating in roles earlier regarded as masculine responsibilities** – the WEE-CSA project demonstrated that through the kitchen gardens and engagement in other income-generating activities, women could effectively provide and support men in meeting household food needs and supplement the household incomes. Increased income saw women effectively contribute to household expenditures- education, food, clothing, and health, which were initially regarded as preserves of men. In the bee-keeping value chain, women were enabled to harvest, store, and sell honey. Harvesting of honey was initially a responsibility only conducted by men but women, with modern hives and harvesting gear are enabled to harvest honey.

  "Men are increasingly accepting the role of a woman in the household more than ever before"
  ~ToT Umande Ward, Laikipia.

Before the project, beekeeping was undertaken traditionally and was an activity of men. Capacity building women in apiculture has enabled them to engage in beekeeping like men thus shifting roles~ Jemima, Key Informant, and extension officer, Mutomo-Kibwea, Kitui County

- **Shift in ownership of assets** – key informants 12 out of 16 and participants in 2 of the 7 focus group discussions indicated that women-owned at least a goat and could access land. Initially, men who also controlled access and utilization owned livestock and land but through this project, men allowed women to access portions of land where they can now practice agriculture. Through the project, they managed to own livestock- dairy goats, and beehives.

  "Unlike before the project, women now own goats and sheep from the project. Before, we were not allowed to own livestock" ~ women group discussion (Kobuyin Women group) West Pokot

- **Reduced Gender-based Violence (GBV) incidences.** All the participants in the 7 focus group discussions conducted revealed that women were actively contributing towards the household expenditures. Due to their contribution to household expenditure, men allowed women to be actively involved in development activities, including participation in markets and in public participation forums by the county government to contribute towards household expenditures, which previously was more of a masculine responsibility. Women reported receiving support including freedom and support to engage in kitchen gardens and to engage in meetings reduced household misunderstanding leading to changes in conversation tones at the household level from emotional and violent tones to a more tolerant tone. As such the emotional violence caused by verbal abuses and quarrels declined considerably as men acknowledged and valued the contribution of women in agriculture and overall development. Seemingly, women's contribution towards the household income basket and expenditures tilted to power balance in their favor. According to the 4th annual donor report in 2023, an increase in girls attending schools was observed, facilitated by women beneficiaries who could afford to pay the school fees through the increased income from CSA activities. These positive changes are attributed to deliberate efforts to involve more men and boys as well as community leaders in the project.

  My husband does not ask me even when I get late from our group meeting, and he even reminds me of the dates the group was supposed to have a meeting. Before WEE-CSA, I had to explain if I returned home past 6.00 PM ~ A female member of Amuka Wisi PLWD group in Kitui.

4.2. PROJECT IMPLEMENTATION CHALLENGES

Although the project strengthened women economic position, there were notable challenges on the implementation process. Implementation challenges were drawn from a synthesis of Key Informant discussions with the Trainers of Trainers (ToTs) team. These challenges pointed to some unclear understanding of the beneficiary groups

Finding 23: Challenges that befell the project implementation process dwarfed the impact that the project could have realized.

- Delay in delivery of the assets under the project – some of the assets that were expected to be delivered early into the project implementation reached the farmers long after training and late in the project implementation dates. As such, the impact of these assets such as hatcheries could not be discerned at the time of evaluation that closely followed the issuance date. This delay was

orchestrated by a lack of proper anticipation and planning at the inception phase of the project that would have allowed the implementers to anticipate the project procurement and time requirements.

- Mismatch of equipment issued and the level of groups. Some groups issued with some assets such as the incubators were not yet ready to use them or the value chains have not grown to employ the assets effectively. Moreover, even the poultry value chain was not well developed to provide eggs for hatching in the incubators. This impaired the outcome expected.
- Program design appears not to have been informed by prior studies on value chains- the scale of the value chains was very low to make meaningful commensurate returns to the time and monetary resources invested in capacity building.
- Delayed and low facilitation of Trainers of Trainers (ToT) - the frontline implementers of the project were ToTs trained in the respective counties. They were tasked with the day-to-day implementation of the project. They trained the farmers on various aspects including leadership, financial literacy, and crop and livestock husbandry. Evidence from key informant discussions revealed a glaring gap in the facilitation of the ToTs in that the facilitation was often delayed and failed to meet the costs of logistics while meeting groups for training.

Finding 24- Data and information documenting the beneficiary and comparison groups were limiting.

- The evaluation faced challenges of data and information- the documentation of groups was limiting to the effect that a random sample could not be conducted at the member level. This creates some bias in the sampling process as chairpersons of the groups were left to make a choice on who was to be interviewed.

4.3. SUSTAINABILITY OF WEE-CSA INTERVENTIONS AND BENEFITS

The synthesis of information generated through key informant interviews and focus group discussions, and the survey reveals the likelihood of continued benefit from WEE-CSA faces risks from several sources. While there is the risk of financing as the donor funding is withdrawn, there is also an existential threat that emanates from negative climate change phenomena such as drought. An examination of the sustainability of WEE-CSA post-donor funding reveals some measures that anchor the continued benefits of WEE-CSA. Sustainability also faces risks from likely political changes in county governments that may have no focus on gender and or climate-smart agriculture. The following aspects will ensure the sustainability of the WEE-CSA project gains.

Finding 25: The project demonstrated effective mechanisms of ensuring the sustainability of the project as implementing partners, government institutions and communities engaged appreciate the project and its objectives and appear actively involved in project activities.

- **Encourage strong commitment by the county governments to continue supporting women empowerment** - the benefits of WEE-CSA are likely to continue with ensured financial and technical support on women empowerment from the county governments. The lining of funding for gender and climate-smart agriculture in the counties indicates their willingness to ensure that the interventions of WEE-CSA are incorporated into the targets of the relevant departments.
- **Development of policy, legal, and institutional frameworks** - Policies are guidelines for economic and social development. Several policy frameworks were developed to guide development aligned with the WEE-CSA agenda. For instance, gender policies developed are oriented toward women's empowerment through increased participation in development processes and access to productive assets. These policies are likely to go beyond the political cycles and ensure continued support for the agenda.
- **Enhanced social fabric through community groups promoting women's development** - awareness of the role of women in household, community, and national level development gained traction, especially through the women groups which will likely remain together beyond the project

implementation period. Such awareness and the positive benefits gained as women contribute to household expenditures are unlikely to be backtracked.

- **Developed informal financial systems** - the WEE-CSA groups have formed village savings and loans associations migrating from the old merry-go-round informal financial system. These informal financial systems create an easy way of financial access providing financial support that enables women to support family expenditures with ease. Women were using some of the accessed financial support from these informal financial services to finance investments in climate-smart technologies. These financial institutions are of benefit to the community in financing climate-smart technologies after the closure of the project.
- **Skills and knowledge on climate-smart agriculture** – the WEE-CSA project inculcated important and beneficial skills and knowledge in the minds of women in the community groups. These skills and knowledge can only be applied given access to finance guaranteed through the village's informal financial institutions, policies, and institutions that guarantee access to productive assets such as land. Evidence from the survey reveals that 25% (n=333) of the respondents interviewed will re-invest in climate-smart agriculture with a focus on the value chains from WEE-CSA while 13% (n=333) seek extension services from the extension agents and 7% (n=333) will seek finances from the table banking for re-investment in climate-smart agriculture technologies. Moreover, the confidence and information provided on climate change and markets through extension buttresses these skills.

SECTION 5. - KEY LESSONS LEARNT AND CONCLUSIONS

5.1. LESSONS

The implementation and impact of WEE-CSA generate several lessons important in designing the second phase of the WEE-CSA and other related projects –

1. Interventions to support policy, legal, and institutional development influence budgetary allocation at the county level. This means that an up-to-date policy and institutional framework offers an opportunity to guide in allocation of finances to mitigate climate change and gender disparities **[Finding 1].**
2. Climate-smart agriculture technologies confer benefits to women - Climate-smart agriculture has a positive influence on agricultural productivity, and household income, which in turn positively empowers women economically and positively influences household food security. These gains are made by those who invest in the CSA technologies **[Finding 2;The decline** in proportion of those utilizing CSA in the comparison group proved that communities need support to continue using the technologies. Most probably, support in market linkages associated with the particular technology. As such, perhaps WEE-CSA interventions propped the beneficiary group to continue making use of the technologies compared to the unsupported comparison group. Although the survey did not establish the reason behind the high adoption at the baseline, the high rates can be attributed to perhaps earlier projects or the natural drive for farmers in the ASALs to practice climate-smart technologies.
3. **Finding 3;Finding 7;Finding 20].**
4. Women are important actors in addressing climate change and food insecurity by adopting mitigation technologies and practices. If women's leadership skills are developed, empowered through extension, credit access, climate change information, market information, and access to land, they can play a greater role in curbing the vagaries of climate change. Moreover, empowering women has positive effects on the food security of households with months of food insecurity declining. [**Error! Reference source not found.**;**Finding 5**; **Finding 6**;**Finding 7**, **Finding 8**, **Finding 9**;**Finding 11Finding 13**;**Finding 14**; **Finding 19**;**Finding 17**].
5. Inclusivity leads to positive gains in agricultural development with PLWDs effectively contributing towards and benefiting from climate change mitigation and gaining from economic empowerment justifying inclusivity in development projects. For instance, the PLWDs were found to have higher diversification in CSA technologies, realized a higher gain in income and the decline in poverty was also higher compared to non-PLWDs [**The decline** in proportion of those utilizing CSA in the comparison group proved that communities need support to continue using the technologies. Most probably, support in market linkages associated with the particular technology. As such, perhaps WEE-CSA interventions propped the beneficiary group to continue making use of the technologies compared to the unsupported comparison group. Although the survey did not establish the reason behind the high adoption at the baseline, the high rates can be attributed to perhaps earlier projects or the natural drive for farmers in the ASALs to practice climate-smart technologies.
6. **Finding 3**;**Finding 15**;**Finding 16**].
7. Climate-smart Agriculture programs may not necessarily result in building household resilience especially if asset-related interventions are delayed and do not auger or integrate well with pre-existing economic activities. This implies that programmatic interventions that seek to build community assets should be matched with the entrepreneurial skills of the groups if they are to yield returns in a shorter time. Else, they remain unemployed for the intended purposes for a long or never get utilized [**Finding 18**,**Finding 23**].

8. Prohibitive gender norms and cultural practices are hard to die and require persistence creation of awareness and gender-responsive capacity building. Notably, there is still a long way towards empowering women. Cultural norms and attitudes, poor financial access for women, and illiteracy that prohibit women's economic empowerment are still persistent [**Finding 22**].

5.2. CONCLUSIONS

The WEE-CSA project was implemented between 2020 and 2024 to empower women economically through climate-smart agriculture in Kitui, Laikipia, and West Pokot Counties. In each county, the project targeted three wards selected on the principle that there was no other CSA-related project and high poverty levels. The project was implemented through community groups, 80% women groups, and included the youth and PLWDs. It sought to build the capacity of community groups on agri-business, financial literacy, climate-smart agriculture, livestock production and range management, gender advocacy, group dynamics, and leadership.

This evaluation examined whether the interventions of WEE-CSA had an impact on several outcomes as envisioned in the project design using the difference-in-difference (DiD) quantification method. The outcomes of interest included the adoption of CSA proxied by the area under climate-smart technologies, increased productivity in crops and livestock in targeted value chains (Beans, onions, fodder, green grams, potatoes, dairy goat, vegetables, dairy goat milk, doper, Galla (meat), goat, poultry, eggs, and honey), women economic empowerment, household income, poverty, food security, and household resilience to climate change. Following the analysis of both qualitative and quantitative data, the following are the key conclusions of the evaluation: -

1) **Policies and institutions with relevance to gender -** WEE-CSA enhanced the policy and institutional environment for gender-responsive climate-smart agriculture. The project improved the climate change and gender policy, institutional and legal ecosystem in the three counties by supporting the development of policies and legal frameworks that relate to gender equity and climate change adaptation. These strategic documents reshaped the budget landscape with an increase in budget allocations towards gender and climate change mitigation activities ensuring the sustainability of the project beyond its implementation. Moreover, the project led to increased participation of women in the development of county strategic documents that guide resource allocations. The proportion of women participating in the development and implementation of CSA doubled from 8% at the baseline to 16% at the end-line. Although the project led to the development of some policies, policy development and mainstreaming of gender is not yet tacit to recognize the role of women's contribution towards the household economy and in the mitigation of climate change impacts. Development of gender policies in the three counties is still in progress and implementation is quite limited by budget in turn limiting women's increased access to land, and other productive resources, participation of women in markets, public participation, and other economic development platforms [**Finding 1; Finding 6**].

2) **Women's access to financial services enabled them to invest in CSA -** The project enhanced the capacity of women for financial access increasing the proportion of women who had financial literacy from 58% to 64% between the baseline and end-line. Although this did not lead to a huge increase in the women participating in CSA, financial literacy transformed the traditional merry-go-rounds into table banking, or Village Savings and Loans Associations (VSLAs), granting women informal financial access which helped them borrow to invest in CSA and meet short-tern household expenditures and investment in climate-smart agriculture practices such as kitchen gardens and zai pits. Women's contribution to the household expenditure basket proved convincing and granted them some more space towards gender equity. However, there is still room for deepening and widening the reach of financial access if women are to be more empowered [**Finding 5**; **Finding 6**; **Finding 7**, **Finding 9**; **Error! Reference source not found.**].

3) **Economic empowerment of women- the project empowered women economically by building women's leadership skills which increased their participation in household and development decision-making processes and, Climate change Action** - The project built the leadership skills of women increasing their participation in the development of Climate Change

Action and Climate-smart Agriculture strategies and in decision making. The three counties reported an increased number of women contributing towards county public participation which the devolved units use to allocate resources. The increase in the allocation of resources towards gender-related issues and climate-smart agriculture technologies is partly attributed to women's participation in related decision-making forums. Through gender advocacy and mainstreaming programs messaging and leadership capacity building, women were economically empowered to voice out their challenges resulting in increased participation in decision-making actively and in the development of policy frameworks such as County Integrated Development Plans (CIDPs) and gender policies that influence resource allocation. But with only 28% capacity built on leadership, a huge proportion is remaining implying that more efforts are still needed to bring them into the fold of participating in decision-making. [**Finding 8**; **Finding 19**].

4) **The hectarage under Climate-smart Agriculture expanded leading to increased agricultural productivity** – the project increased adoption of CSA, area under CSA and consequently enhanced agricultural productivity - Training of farmer groups on gender-responsive range rehabilitation and environmental conservation, provision of extension services, market information, information on climate change and credit access coupled with provision of small grants and drought resistant seeds and high value vegetables resulted into increased adoption and diversification of CSAs including Zai pits, sunken beds, moist beds, water pans, storage tanks, semi-circular ponds, farm ponds, and shallow wells leading to expansion of the area under climate-smart agricultural practices. The proportion of farmers utilizing climate-smart agriculture technologies increased from 70% to 73% while the area under climate-smart agriculture increased from 0.22Ha to 0.33Ha per household between the baseline and end-line. Increased adoption of climate-smart agriculture technologies led to improvement in productivity in various value chains in both crops and livestock. The improvement was supported by the availability and use of water from climate-resilient water conservation structures by the project. The proportion using water from the climate-resilient water structures increased from 59% during the baseline to 85% by the time the project ended. However, with intensified expansion services and access to financial resources, there is still room for increased adoption of CSA technologies and agricultural productivity since only 73% had adopted at least one technology by the end of the project [**Finding 2**; **Error! Reference source not found.**; **Finding 5**; **Finding 12, Finding 13**, **Finding 21**].

5) **Household income increased leading to reduced food poverty** - Increase in productivity enabled women to produce enough for consumption and surplus for sale. The annual income per household increased from KES 92,543 ($ 718) to KES 131,790 ($ 1,014), a 36% increase with 62% of the beneficiaries reporting a positive gain in incomes. The CSA technologies enhanced food availability at the household level, especially vegetables, and reduced the food expenditures that households would have incurred thus relaxing household income for other economic activities that would enhance the welfare of the households. As a result, the proportion of households experiencing the severe category declined from 66% to 42% and those with moderate and mild experience increased from 17% to 23% and 18% to 35% respectively. Moreover, the project shortened the number of months households faced food shortages from 5 to 2 months by the time the project implementation ended. Still, many households are food insecure and face longer months of food shortages which needs to be addressed [**Finding 9**; **Error! Reference source not found.**; **Finding 13**; **Finding 14**, **Finding 17**].

6) **Gender-based violence (GBV) reduced -** Gender-based violence declined as women became more aware of their role in the family through gender mainstreaming messages, capacity building through leadership skills, and empowerment through participation in income-generating opportunities. However, accelerated progress toward reducing gender inequality gaps is hampered by inaccessibility to financial services, illiteracy, cultural norms, and attitudes [**Error! Reference source not found.**;**Finding 11**; **Finding 19**; **Finding 22**]

Persons Living With Disabilities (PLWDs) gained from CSA adoption - the inclusivity in WEE-CSA favored the PLWD in some instances. For instance, the PLWDs were found to have higher diversification in CSA technologies, realized a higher gain in income and the decline in poverty was also higher compared to non-PLWDs and realized a higher gain in income and the decline in

poverty was also higher compared to non-PLWDs, all driven by the adoption of CSA. This raises the need to consider inclusivity in every project design **[**The decline in proportion of those utilizing CSA in the comparison group proved that communities need support to continue using the technologies. Most probably, support in market linkages associated with the particular technology. As such, perhaps WEE-CSA interventions propped the beneficiary group to continue making use of the technologies compared to the unsupported comparison group. Although the survey did not establish the reason behind the high adoption at the baseline, the high rates can be attributed to perhaps earlier projects or the natural drive for farmers in the ASALs to practice climate-smart technologies.

7) Finding 3; Finding 15;Finding 16].

8) **The project had a weak influence on the resilience of the households to climate change and food insecurity** - Due to delays in the delivery of assets stemming from cumbersome procurement, the impact of the project on household resilience was dwarfed. Limited household resilience implies that the gains made towards the adoption of CSA, agricultural productivity, household income, food security, and women empowerment by the project risk being eroded in the event of a climate or economic shock because of the low resilience capacity of the households - [**Finding 18**;].

9) **The project was befallen by challenges that dwarfed its impact –** these challenges included the delay in delivery of some of the assets designated by the project due to lengthy procurement processes and lack of anticipation of the time requirement of the deliveries at the inception phase, delayed and low facilitation of the ToTs. [**Finding 23**].

10) **The project data and information on the groups were weak –** which was a challenge to monitoring evaluation and tracking of the impact. Data on the beneficiary and comparison groups was weak to adequately track the progress of the project [**Finding 24**].

5.3. RECOMMENDATIONS

The following recommendations were synthesized from the descriptive and quantitative analysis results and synthesis from the implementing partners, county staff who coordinated and also provided the extension services as well as mobilizing the community women groups.

Recommendation 1: Support counties in the development of policy, legal, and institutional frameworks to foster gender equality and climate change mitigation in the allocation of resources towards climate-smart agriculture.	
How to do	- Identify the departments with relevance to women's economic empowerment– Specifically departments of agriculture, water, environment, and gender. - Capacity build the staff in these departments on the public policy-making process, - Supporting forums to discern issues related to gender and climate-smart agriculture and the budgeting process. - Support in the development of the policies – support forums for discussion and identification of the strategies in these policies. - Facilitate consultants to assist in developing the policies
Responsible actor(s)	- UN-Women - FAO - National and County Governments' respective departments and directorates. - Other stakeholders
What if it is not done	- Those not supported may develop ineffective policy, and legal and institutional frameworks or may not be enabled to allocate resources towards gender and climate change mitigation.
Urgency	- High because there is a need to maintain the already created momentum and to safeguard the gains that have been made on gender transformation and CSA in the three counties.
Impact	- High, potentially ensuring engagement of the county and sustainability of the achieved project results.
Difficulty	- Low, the UN Women and FAO can cost-share the capacity building costs with the counties. The willingness of the counties to be supported on policy-making is high.
Link to findings	- [**Finding 1**]
Recommendation 2: Support extension services, climate change information, market information and market linkages supply and credit services to women	
How to do	- Establish collaboration with departments relevant to gender including the Department of Agriculture, Livestock and Fisheries, Department of Water, Department of Environment and Natural Resources, and Department of Education and Gender at the county level to make use of the county extension staff and skills, - Identify and work with common interest groups to pass early warning, climate, and market information as well as capacity building in aggregation. - Link up with buyers and Stuckists of farm produce to establish contractual engagements, - Engage value-addition agents (local hotels, schools, hospitals) to absorb the produce from supported value chains. - Capacity building on VSLAs to facilitate localized financial access to women
Responsible actor(s)	- UN-Women - FAO - National County Governments.
What if it is not done	- Value chains that are not supported with extension services, markets, and linkage to markets usually collapse.
Urgency	- High because there is a need to generate income in the rural setups to mitigate the effects of increasing unemployment and living standards. This will prevent the downward spiral poverty trend
Impact	- High, potentially this generated income to the households ensuring food security, health, and education access
Difficulty	- Low, counties positively embrace efforts to fight poverty and are at the forefront of developing enabling physical infrastructure.
Link to conclusions/ findings	- [**Finding 9**;**Finding 19**;**Finding 21**].
Recommendation 3: Build the capacity of women's leadership skills to enable them to effectively participate in economic decisions at the household and government level	
How to do	- Identify women in groups, if not registered, support them to register with the government to make them officially recognized. This will also facilitate them to access formal financial services as a group.

	- Train the women groups on leadership and governance, management of community groups, and development of self-help group rules and regulations
Responsible actor(s)	- UN-Women - FAO - County Governments. - Community groups - Local leaders
What if it is not done	- Women will increasingly be overshadowed and sidelined in decision-making regarding the allocation of resources towards gender-related issues.
Urgency	- High because of persistent gender inequalities propped by customs and norms that prohibit women's economic growth.
Impact	- High, ensured sustained allocation and implementation of economic activities that narrow the gender inequality gaps
Difficulty	- Low, there is a great push on gender and climate change and women are poised to increasingly be positive in leadership
Link to conclusions/ findings	- [**Finding 8**].
Recommendation 4: Build the absorptive and adaptive capacity through widening the asset base of communities and households to strengthen their resilience to climate and even economic shocks and prevent erosion of gains made -	
How to do	- Capacity building on early warning systems - Support the communities with assets that they can use to overcome economic and climate-related shocks. These assets should be considerate of the skill and usability within the local context. - Continued support to climate change mitigation and climate-smart agriculture technologies - Support in cash or food transferred to food-insecure community segments to cushion the communities and assist them in overcoming food insecurity.
Responsible actor(s)	- UN-Women - FAO - County Governments.
What if it is not done	- Gains made by WEE-CSA are at risk and vulnerable to shocks emanating from climate change and exogenous economic shocks. They need to be safeguarded by developing the resilience of the households to the effect.
Urgency	- High – The increasing negative climate change phenomenon is driving the demand for resilience-building interventions to mitigate the negative outcomes. Counties are willing to continue strengthening resilience-building capacities in order to minimize emergency budgets
Impact	- High, ensured sustained benefits from WEE-CSA
Difficulty	- Low, the Country Office can negotiate with Finland and other key donors to continue investing in the project for sustainability of the results achieved and to drive impact.
Link to conclusions/ findings	- [**Finding 18**].
Recommendation 5: Enhance the participation of PLWD in line with the Leave No One Behind (LNOB) principle through budgeting and providing for their special needs such as transport, assistive devices, and helpers.	
How to do	- Deliberately, include groups of PLWDs in programs, - Engaging sign language interpreters to train PLWDs depending on the disability, - Use of enhanced hearing devices, - Organizing logistics for PLWDS living in the far to reach areas to attend meetings and training forums or public participation forums
Responsible actor(s)	- UN-Women - FAO - County Governments.
What if it is not done	- The LNOB principle will be violated and gender equity cannot be achieved.
Urgency	- High – because most of the PLWDS are marginalized and often are disproportionally affected by negative climate change phenomenon
Impact	- High, ensure the sustained fight against poverty and food insecurity
Difficulty	- Low- counties have budgets that focus on PLWDS and are willing to collaborate with partners to implement related interventions
Link to conclusions/ findings	- [**The decline** in proportion of those utilizing CSA in the comparison group proved that communities need support to continue using the technologies. Most probably, support in market linkages associated with the particular

	technology. As such, perhaps WEE-CSA interventions propped the beneficiary group to continue making use of the technologies compared to the unsupported comparison group. Although the survey did not establish the reason behind the high adoption at the baseline, the high rates can be attributed to perhaps earlier projects or the natural drive for farmers in the ASALs to practice climate-smart technologies. - **Finding 3**;**Finding 15**; **Finding 16**]
Recommendation 6: Increase investments in climate-smart agriculture technologies for expansive and intensive gains on agricultural productivity, income, reduced poverty and food insecurity	
How to do	- Promote the establishment and operations of Village Savings and Loans Associations (VSLAs)/table banking as these have provided the financial facilitation towards increased investments in CSA. - Capacity building on kitchen gardens - Continue training on CSAs
Responsible actor(s)	- UN-Women - FAO - National and County Governments. - Others
What if it is not done	- Evidence has shown that those not supported may not have the financial capacity to invest in some of the cost and labor-intensive CSA technologies such as water pans, and Zai-pits.
Urgency	- High because there is a need to maintain the already created momentum and to safeguard the gains that have been made on CSA in the priority counties.
Impact	- High, potentially ensuring sustainability of the achieved project results.
Difficulty	- Low, climate change is dictating the phase of adoption of CSAs. Counties have already developed CCA legal and institutional structures that donors can leverage on.
Link to conclusions/ findings	- **[Finding 20]**
Recommendation 7: Invest in changing attitudes and practices as well as breaking down harmful practices that fuel gender inequality and GBV in order to enable accelerated participation of women in economic activities	
How to do	- Capacity building women and men on gender roles and the important role of women and youth in household and community development - Training of VSLAs to facilitate access to local financial credit - Capacity building on Climate-smart Agriculture technologies - Deliberately target vulnerable women to participate in programs - Market linkage to enable income generation from enterprises selected.
Responsible actor(s)	- UN-Women - FAO - County Governments.
What if it is not done	- Those not supported may develop ineffective policy, and legal and institutional frameworks or may not be enabled to allocate resources towards gender and climate change mitigation.
Urgency	- High because there is a need to maintain the already created momentum and to safeguard the gains that have been made on gender transformation and CSA in the three counties.
Impact	- High, potentially ensuring sustainability of the achieved project results.
Difficulty	- Low, the Country Office can negotiate with Finland and other key donors to continue investing in the project for sustainability of the results achieved and to drive impact.
Link to findings	- [**Finding 11**;**Finding 22**]
Recommendation 8: Develop an effective knowledge management system and function for each project so as to manage data and information amenable to monitoring and evaluation of the project	
How to do	- Establish a data collection and management system for the program - Engage professional staff in data collection and management - Design a program with SMART indicators

Responsible actor(s)	- UN-Women - FAO - County Governments.
What if it is not done	- Those not supported may develop ineffective policy, and legal and institutional frameworks or may not be enabled to allocate resources towards gender and climate change mitigation.
Urgency	- High because there is a need to maintain the already created momentum and to safeguard the gains that have been made on gender transformation and CSA in the three counties.
Impact	- High, potentially ensuring the sustainability of the achieved project results.
Difficulty	- Low, the Country Office can negotiate with Finland and other key donors to continue investing in the project for sustainability of the results achieved and to drive impact.
Link to findings	- [**Finding 24**].
Recommendation 9: After the project completion, plan to undertake a sustainability evaluation to deeply understand what happens when a project comes to a closure	
How to do	- Plan, design, and budget for the sustainability survey - Identify relevant government departments (National and County) and align and anchor the CSA works - Work with the government departments (National and County) to incorporate the elements of the CSA programs in their development strategies and policies as well as developing departmental institutions that will drive the implementation of CSA activities.
Responsible actor(s)	- UN-Women - FAO - County Governments.
What if it is not done	- Lessons on sustainability will never be learned. Most of the project interventions collapse immediately after the project implementation ends and redress mechanisms for this conundrum have not been clear.
Urgency	- High- because there is a need to maintain the already created momentum and to safeguard the gains that have been made on gender transformation and CSA in the three counties.
Impact	- High, potentially ensuring the sustainability of the achieved project results.
Difficulty	- Low, the Country Office can negotiate with Finland and other key donors to continue investing in the project for sustainability of the results achieved and to drive impact.
Link to findings	- [**Finding 25**]
Recommendation 10: Ensure that for every project, a review of procurement requirements is done so as to clearly anticipate and plan for the timely delivery of project items and elements that may take time to obtain for example assets that are to be transferred to the community for development purposes.	
How to do	- Plan and budget for engagement of ToTs - Establish a mechanism to track their activities - Establish a mechanism to ensure timely facilitation - Capacity build ToTs on the thematic areas of project implementation
Responsible actor(s)	- UN-Women - FAO - County Governments.
What if it is not done	- Implementation of activities is delayed, or poorly performed and evaluations result in negative results.
Urgency	- High, review of the existing modalities is urgent for faster implementation of resources.
Impact	- High, review of the existing modalities has the potential to ensure efficient programme implementation and effectiveness in the achievement of results.
Difficulty	- Moderate, this might require a review of corporate policies.
Link to findings	- [**Finding 13**, **Finding 23**].

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SECTION 7. ANNEXES

Annex 1 WEE-CSA Stakeholders

Stakeholder/Partner	ROLE
KOICA	• Donor
UN Women	• Responsible and accountable for managing the project • Implement activities under the Outcome 1 and 3 of the projects • Undertake project monitoring and evaluation interventions and keep data on beneficiaries of the project • Reporting on project achievements both narrative and financial to the donor • Prepare and enter into an agreement with the collaborating agency FAO. • Establish a Project Management Unit (PMU), which will be staffed by UN Women and will incorporate technical advisors and thematic specialists on CSA.
UN FAO Kenya	• Cooperating partner to UN Women Kenya • Enter into an agreement with UN Women as a collaborating agency FAO • Implemented activities under the Outcome 2 of the project • Provide technical staff to conduct specialized training on CSA at the county level • Provided access to established county offices in the project target areas where FAO has county offices • Participated in project monitoring and evaluation interventions • Compiled project reports and submit to UN Women as per the agreement • Participated in bilateral donor review meeting with KOICA
Ministry of Agriculture (MoA) – National and County level **Ministry of Environment and Natural Resources (National and County level)**	• This is the principal body at the national level mandated for agriculture and CSA-related policy and legislative agenda. However, agriculture is devolved and county governments have full mandate to operationalize agricultural extension activities and to mainstream national policies at the county level. • This is a collaborating partner with the Ministry of Agriculture on matters to do with climate-smart agriculture
Ministry of Public Service, Youth and Gender Affairs (National and County level)	• Principal body at the national level responsible for Gender Mainstreaming and women's empowerment
Council of Governors	• Intergovernmental body coordinating the work of county governments
National Drought Management Authority (NDMA)	• NDMA is an agency of the Government of Kenya mandated to establish mechanisms that ensure that drought does not result in emergencies and that the impacts of climate change are sufficiently mitigated.
Women's Association in The Targeted Counties	• In the selected counties
County Assemblies	• In the selected counties for CSA policy and legislative reforms
Men Alliance Kenya	• This is the umbrella organization for male engagement for women's empowerment in Kenya
Financial Institutions	• Various to facilitate access to financial services for women farmers
Anglican Development Services Eastern (ADSE)	• Implemented the WEE-CSA project in Kitui County focuses on transforming communities across Machakos, Kitui, Makueni, and Garissa counties through integrated development initiatives. Focused on fostering secure and sustainable livelihoods, ADSE operates across multiple thematic areas including Food Security, Water, Sanitation and Hygiene (WASH), Climate Change and Environmental Conservation, Health, Nutrition, Gender & Social Inclusion, and Institutional Capacity Development
Village Enterprises (VE)	• Implemented the WEE-CSA project in West Pokot County covering Riwo, Batei, and Suam Wards in Kapenguria, Kipkomo, and Kacheliba Sub Counties, West Pokot County
Hand in Hand Eastern Africa (HiHEA)	• Within the Women Economic Empowerment through Climate-smart Agriculture (WEE-CSA) project, HIH EA focuses on Laikipia County, specifically in Mukogodo East, Umande, and Tigithi wards. The project engages 988 members, predominantly women (90%), with significant youth participation (40%) and inclusion of people with disabilities (8%). Key outcomes include the development of gender-responsive climate-smart policies and enhanced capacity of both national and county governments in policy development and implementation

Annex 2: Programs Related To WEE-CSA

Project	Description (summary)
NARIG	• The National Agricultural and Rural Inclusive Growth Project (NARIGP)- 2017-2022 is a Government of Kenya (GoK) project that was implemented through the Ministry of Agriculture, Livestock Fisheries and Irrigation (MoALF&I), State Department for Crop Development (SDCD), with funding support from the World Bank. • The project was approved by The World Bank board on 23rd August 2016, became effective on 28th July 2017, and run through 2022 overlapping with the initial years of WEE-CSA. • The project objective was to *increase agricultural productivity and profitability of targeted rural communities in selected Counties, and in the event of an Eligible Crisis or Emergency, to provide an immediate and effective response"* • The project was implemented in 21 counties including Kitui County. Source: https://www.kalro.org/research-projects/national-agricultural-and-rural-inclusive-growth-project-narigp
KCSAP	Kenya Climate-Smart Agriculture Project (KCSAP)- 2017-2022 was a Government of Kenya/World Bank-supported project under the State Department for Crops Development in the Ministry of Agriculture, Livestock, Fisheries and Irrigation (MoALF&I). Was implemented in 24 counties among others including Laikipia and West Pokot covered by WEE-CSA. The objective of KCSAP was to strengthen Climate-Smart Agricultural Research and Seed Systems. Supporting Agro-weather, Market, and Advisory services. The project was implemented within five components: i. Component 1: Upscaling Climate-Smart Agricultural Practices; ii. Component 2: Strengthening Climate-Smart Agricultural Research and Seed Systems; iii. Component 3: Supporting Agro-weather, Market, Climate, and Advisory Services; iv. Component 4: Project Coordination and Management; v. Component 5: Contingency Emergency Response. Source: https://www.kalro.org/research-projects/kenya-climate-smart-agriculture-project-kcsap
KCEP-CRAL	**Kenya Cereal Enhancement Programme - Climate-Resilient Agricultural Livelihoods Window (KCEP-CRAL) 2015-2024. KCEP-CRAL is being implemented in 13 counties among others including Kitui.** KCEP-CRAL aims to reduce rural poverty and food insecurity among smallholders in Kenya's arid and semi-arid lands by developing their economic potential while improving their natural resource management capacity and resilience to climate change in an increasingly fragile ecosystem. This goal will be pursued through: i. Graduation of smallholder farmers to commercially oriented, climate-resilient agricultural practices through improvements in productivity, post-production management practices and market linkages for targeted value chains ii. empowerment of county governments and communities to sustainably and consensually manage their natural resources and build resilience to climate change. Source: https://www.ifad.org/en/web/operations/-/project/1100001651

Annex 3: Terms of Reference

Background/Context

UN Women, grounded in the vision of equality enshrined in the Charter of the United Nations, works for the elimination of discrimination against women and girls; the empowerment of women; and the achievement of equality between women and men as partners and beneficiaries of development, human rights, humanitarian action and peace and security.

Placing women's rights at the center of all its efforts, and in line with the ongoing UN Reform, UN Women leads and coordinates the United Nations system efforts in Kenya to ensure that commitments on gender equality and gender mainstreaming translate into action. It provides strong and coherent leadership in support of Kenya country office priorities and efforts, building effective partnerships with civil society and other relevant actors.

UN Women Kenya and FAO Kenya are jointly implementing a Korea International Cooperation Agency (KOICA) funded four-year project on Women's Economic Empowerment through Climate-smart Agriculture (WEE-CSA) that started in 2020. The project, implemented in partnership with the Ministry of Agriculture, Livestock, Fisheries and Cooperatives and State Department for Gender complements and builds on the ongoing Climate-Smart Agriculture (CSA) work in three counties namely Kitui, Laikipia and West Pokot.

The project aims to strengthen the national and county government's capacity to provide a gendered perspective and promote gender equity and equality in the adoption and implementation of climate-resilient agriculture approaches as an effort to build resilience and adapt to climate change in the ASALs. More specifically, the project aims to:

i) Strengthen the capacity of direct beneficiaries who are 2400 farmers, [80% female farmers and 20% male farmers], 800 per each county, and their family members to build sustainable economic livelihoods from climate-smart agriculture approaches and along priority agricultural value chains, including the adoption of CSA and climate change adaptation (CCA) technologies and practices.
ii) Support women to participate in decision-making of CSA-related policy interventions fully and equally at all levels.
iii) Strengthen the capacity of key institutions to mainstream gender in national and local adaptation plans, related policies, strategies, and systems.

The WEE-CSA project envisioned a results-based monitoring approach that will promote greater accountability on results with verifiable information thus a robust M&E system was set up to strengthen upward and downward accountability to key stakeholders. As part of M&E, baseline, mid-term, and end-line studies were planned to track and assess progress towards achievement of project results. Subsequently, a baseline study was conducted between April and September 2021 to collect data on a set of key performance indicators that will inform program implementation. In particular, the study established benchmarks upon which progress will be measured, informed the selection of project sites and identified priority value chains per county. Additionally, an impact evaluation baseline study was conducted in 2022 utilizing the Difference in Differences (DiD) econometric analysis methodology.

To demonstrate the extent to which the WEE-CSA project has been effective in improving women's empowerment, agricultural productivity and food and nutrition security, an impact evaluation has been considered. Therefore, the impact evaluation end-line study will utilize the DiD.

This document presents the Terms of Reference for conducting an impact evaluation end-line study. The purpose of the consultancy is to develop the impact evaluation end-line study framework based on the project goals and targets; to review the available data and to assess the data gaps; to develop the tools and to oversee the data collection, to analyze data and to prepare an impact evaluation end-line study report while utilizing the DiD approach. Whilst the project entry point is communities, outcomes and changes will be measured at the household level. Some beneficiaries are organized in farmer groups as follows: - Total target: Kitui, 40 groups of 911 farmers (761 Female, 150 Male, 398 Youth, 94 persons with disabilities/PLWD); Laikipia, 41 groups of 988 farmers (888 Female, 100 Male, 394 Youth, 80 PLWD); West Pokot, 27groups of 809 farmers (697 Females, 112 Males, 453 Youth, 70 PLWD).

Theory of Change

Overall, the project is being premised on the following theory of change: if (1) climate-smart agriculture and climate adaption are gender-responsive; if (2) women have access to climate-resilient livelihoods, productive assets, technologies, and skills, and this is supported by enabling social norms and practices; then (3) women and girls affected by climate change will play a leadership role and benefit from CSA and climate change adaptation (CCA) efforts; because (4) adaptive capacity to climate change will be enhanced and women's rights and needs will be at the centre of climate-smart agriculture and climate adaption strategies and priorities.

Description of project Locations

Kitui

Kitui County covers an area of 30,496.4 km2 and lies between latitude 00 10' and 30 South and longitude 370 50' East. The County borders Tharaka Nithi to the North, Taita Taveta to the South, Tana River to the East, and Makueni and Machakos to the West and Northwest respectively. The county's population is 1,136,187 (2019 KPHC), with 51.7 per cent female and 48.3 per cent male.

The WEE-CSA project sites are Kauwi ward (380 beneficiaries) in Kitui West and Mutomo/Kibwea (221 beneficiaries) and Athi wards (310 beneficiaries) in Kitui South. The areas are generally classified as semi-arid but with good potential for agricultural

development. Due to erratic and unreliable rainfall, production of drought-tolerant crops and livestock keeping is prevalent in these areas with the drier areas more suited for livestock rearing.

Laikipia

Laikipia County borders Samburu County to the North, Isiolo County to the Northeast, Meru County to the East, Nyeri County to the Southeast, Nyandarua County to the South, Nakuru County to the Southwest and Baringo to the West. It covers an area of 9,462 km2 with a total area of 580 km^2 forming the county's total forest cover. The county's population is 518,560 (2019 KPHC), with 49.97 per cent female and 50.03 per cent male. Three wards are targeted under the WEE-CSA project 41 groups: 988 farmers – 888 female, 100 male, including 394 youth and 80 PLWDs.

West Pokot

West Pokot County is situated in the North Rift along Kenya's Western boundary with Uganda border. It borders Turkana County to the North and Northeast, Trans Nzoia County to the South, Elgeyo Marakwet County and Baringo County to the Southeast and East respectively. The County lies within Longitudes 34° 47'and 35° 49' East and Latitude 1° and 2° North and covers an area of approximately 9,169.4 km2. The county's population is 621,241 (2019 KPHC), with 50.6 per cent female and 49.4 per cent male. The three wards targeted 27 groups: 809 farmers- 697 female, 112 male, including 453 youth and 70 PLWDs.

Context

Building on the impact evaluation baseline study (2022) and the rapid assessment (2023) conducted in the three target counties, UN Women Kenya, in partnership with FAO Kenya, is recruiting a consultant to undertake an impact evaluation end-line study which will determine the changes resulting from the intervention by utilizing the DiD approach. The impact evaluation will assess the key outcomes of individuals before they are exposed to the intervention (treated) and those not exposed to the intervention (control). The impact evaluation study will also assess and update the status of household-level and group-level performance using a set of additional indicators, as listed in Annex 1.

Purpose and methodology

This section outlines the purpose of this end-line study and the methodology. It also describes the methods for analysing the data. The purpose of this end-line study is:

- To collect end-line values for key project indicators as per the log frame.
- To determine changes in the key indicators and assess the impact of the project through econometric methods, including but not limited to the DiD.

Design, sample size and sample frame

The target location for the assignment is composed of three counties in Kenya, namely, Kitui, Laikipia and West Pokot. In the design of the impact evaluation strategy, panel data (baseline and end-line) with intervention respondents i.e.: those that receive full intervention/beneficiaries and non-intervention, who do not receive interventions was envisaged. During the baseline study, the intervention groups were sampled randomly from the beneficiary lists derived from the project's implementation locations while the non-intervention groups were randomly sampled from different communities with similar characteristics as the treatment groups to minimize spillover of the benefits. The beneficiaries were sampled in two levels, random selection of groups and then random selection of group members. The following number of respondents were reached during baseline:

Table 26: Baseline sample size

County	Beneficiaries	Non-Beneficiaries	Total
Kitui	137	69	**206**
Laikipia	166	66	**232**
West Pokot	95	80	**175**
Total	**398**	**215**	**613**

The survey questionnaire used during the impact evaluation baseline was prepared in English and local languages and was implemented on the Kobo Collect platform (https://www.kobotoolbox.org). The questionnaire will require approximately 45 minutes to administer, capturing basic households' demographic characteristics and detailed information on their livelihoods. These included a range of questions on land use and management, crop production, livestock, household inputs, and assets, CSA technologies and practices, off-farm income, hired labor, transfers, decision-making, women empowerment, food security, and credit. The survey needed one main respondent only per household. End-line data collection will be carried out by interviewing the same set of households interviewed at baseline. The FAO/UN WOMEN will provide the geographic coordinates recorded at the time of the baseline and the telephone numbers of the respondents. These tools will facilitate re-contact with the respondents and ensure low levels of attrition.

The consultant will be reporting to the UN Women M&E Analyst and will be supported by the Women's Economic Empowerment (WEE) Programme Assistant, who will be the point of contact on the contract and payment issues.

Description of Responsibilities/ Scope of Work

Specifically, the Consultant will undertake the following tasks:

- Carry out a Desk Review of key documents relevant to the work such as the WEE-CSA Project document, baseline study report, the DiD study report, the rapid assessment report, the Performance Monitoring Plan (PMP), project progress reports, Project Steering Committee minutes/report, CSA-related policy, and strategy documents and relevant DiD method guidance documents to determine the available data to utilize the DiD approach for the impact evaluation end-line study.
- Prepare an inception report for the impact evaluation end-line study with a DiD perspective, including the overall scope, approach, sampling design, schedule, and a detailed outline of the report.
- Refine the data collection tools that were used during the impact evaluation baseline study (soft copy and mobile-based) and develop an analysis plan to enable the DiD analysis to be conducted.
- Prepare the list of the respondents/households (treatment and control) that were visited during the impact evaluation baseline study to be followed up during the impact evaluation end-line study.
- Develop the model, parameters, and econometric regressions (in STATA) to be utilized for analysis in the impact evaluation end-line study including the development of the period for data collection for both the control and treatment groups including the ability to take into control for any spillover effects.
- In collaboration with the UN Women and FAO field officers conduct identification, training, and remuneration of specific county-based survey enumerators for Laikipia, Kitui, and West Pokot counties and field testing of the data collection tools.
- In partnership with the UN Women and FAO field officers, coordinate, and support supervision of data collection in the three target counties.
- Undertake data quality control measures including running data quality checks and providing feedback to the enumerators.
- Clean the data, analyze, and produce a draft impact evaluation end-line study report based on the data analysis plan. This includes indicator-specific analysis by county and beneficiary status, as well as indicator-wide aggregates (or means). The end-line should include an estimate of the impact of the program across the outcome indicators, based on the DiD approach, including significance testing.
- Provide UN Women/FAO with the STATA codes and impact evaluation end-line study raw data.
- Lead a stakeholder validation meeting to present the findings and solicit inputs to inform the final report.
- Revise the draft impact evaluation end-line study report based on comments received from the key stakeholders.
- Derive an academic paper from the report.

Deliverables

Describe the final product/s or deliverables (e.g., survey completed, workshop conducted, data collected, reports written, etc.), in the form of SMART indicators to facilitate review of and approval of deliverables.

***S**pecific: The indicator clearly and directly relates to the outcome. It is described without ambiguities. Parties have a common understanding of the indicator.*

***M**easurable: The indicator has the capacity to be counted, observed, analyzed or tested.*

***A**chievable/Attributable: Are results realistic? Can changes in the targeted developmental issue can be linked to the intervention?*

***R**elevant: An indicator should be a valid measure of the result/outcome…*

***T**ime-bound: Every deliverable has a specific timeline for completion.*

Activity/Deliverables	Tentative Timelines	Estimated Number of Working Days	Payment Schedule Percentage %
♦ Desk Review and meeting with key project staff	8th - 12th April 2024	12 days	1st installment of the consultancy fee - 15% after submission of the inception report[14] Fieldwork (enumerators fees) will be paid as follows. Lumpsum payment for the fieldwork - 100% upon submission of the inception report and signed enumerators' contracts.
♦ Elaborate sampling design	8th -12th April		
♦ Survey Personnel Training Report	15th - 19th April		
♦ Impact Evaluation end-line study data collection tools (including the data collection tools)	8th - 19th April		
♦ Impact evaluation end-line study Inception Report ♦ Enumerators who will conduct field work data collection will be identified, managed and paid by the consultant in line with UN Women's regulations and rules (UBN Women).	8th - 17th April 2024		
♦ Conduct field work data collection, review and data analysis with enumerators.	20th April – 10th May	27 days	2nd installment of the consultancy fee - 85% upon

[14] Inception report should include: i. Refined data collection tools that were used during the impact evaluation baseline study (soft copy and mobile-based) and develop an analysis plan to enable the D-i-D analysis to be conducted. ii. Prepare the list of the respondents/households (treatment and control) that were visited during the impact evaluation baseline study to be followed up during the impact evaluation end-line study. Iii. Develop the model, parameters, and econometric regressions (in STATA) to be utilized for analysis in the impact evaluation end-line study including the development of the period for data collection for both the control and treatment groups including the ability to take into control for any spillover effects.

♦ Draft impact evaluation end-line study report	22nd April – 20th May		the submission of the approved end-line report.
♦ Present draft study report to the reference group for discussion and feedback.	21st May 2024	1 day	
♦ Cleaned and raw end-line data accompanied by Stata do-files. ♦ Incorporate feedback from reference group into the report	22nd May – 28th May 2024	2 days	
♦ Prepare impact evaluation end-line study report and presentations for stakeholders meeting.			
♦ Prepare and disseminate the final impact evaluation to stakeholders	28th May	1 day	
♦ Incorporate recommendations from the stakeholder's engagement into the report.	29th May 2024 – 6th June	1 day	
♦ Present the final impact evaluation end-line study report and supporting documents to UN Women.	7th June 2024	1 day	
Total		**45 days**	**100%**

Consultant's Workplace and Official Travel

This is a home-based consultancy. As part of this assignment, there will be a maximum of four trips in Kenya as per the agreed schedule. The trips will be to the three project locations (West Pokot, Laikipia and Kitui) and one to the location where the project steering committee meeting will be held.

Annex 4: Evaluation Matrix

Evaluation questions	Results chain	Performance indicators, baselines and targets	Disaggregation	Data source (MOV)	Data Collection and method of Analysis
Evaluation Method Difference in Difference					
Did WEE-CSA improve gender responsiveness in Climate-smart policies and regulations to enable investments in climate-resilient agriculture at the national, county and Community level?	**1.1 The increased capacity of national and 3 County Governments on gender-responsive CSA and CCA policy development and implementation**	1.1.1 Number of county governments that implement a gender-responsive system (laws and polices) on CSA policies and strategies (3 county governments)	3 county governments: West Pokot (2022), Laikipia (2022), Kitui (2022)	County policy implementing plans in place. Gender-responsive budget in place to implement the CSA and gender-responsive agriculture strategies. CSA GWG reports.	**Document review:** documents provided by the CSA Gender Working Group **Quantitative analysis** - the proportion of women investing in Climate-smart Agriculture.
		1.1.2 Number of County government staff who participate in the specialized workshop (on domestication and engendering of national-level policies and strategies on climate resilience) Baseline: 0 Target: 300 persons (50% women) for 3 counties	Sex, age, differently abled persons (DAP) and county	Workshop participation lists, activity tracking	Tallying- number collected from secondary reports on training and capacity building.
		1.1.3 Number of County government staff who participate in specialized workshop (gender-responsive CSA policies) Baseline: 0 Target: 300 persons (50% women) for 3 counties	Sex, differently abled persons (DAP) and county	Workshop participation lists, activity tracking	Tallying- number collected from secondary reports on staff participating in specialized workshops

Evaluation questions	Results chain	Performance indicators, baselines and targets	Disaggregation	Data source (MOV)	Data Collection and method of Analysis
Evaluation Method Difference in Difference					
		Number of guidelines developed Baseline: 0 Target: 1	-	Gender mainstreaming guidelines document	Document review: documents provided by stakeholders in WEE-CSA project
		1.1.4. Number of people reached with CSA gender mainstreaming messages Baseline: 0 Target: 6,000 people (50% women, 1% DAPs)	Sex, age, differently abled persons (DAP) and county	Activity tracking reports and beneficiary data	Tallying- Quantitative- proportion of beneficiaries reporting to have been reached by gender mainstreaming messages.
	1.2. The capacity of Women farmers strengthened to engage in gender-responsive policy planning, implementation and monitoring of CCA and CSA	1.2.1. Number of women participating in the development and implementation of CSA Baseline: 0 Target: 48 women groups (approximately 20 women per group; in total 960 women with 1% DAP)	Sex, age, differently abled persons (DAP) and county	Participant lists from CSA policy meetings. Activity tracking reports (including meeting minutes and feedback from women groups). Beneficiary contact monitoring reports.	**Tallying** - from project progress reports **Quantitative analysis**- the proportion of women reporting to have been engaged in planning and development of CCA and CSA
		1.2.2. Number of women investing and participating in CSA Baseline: 0 Target: 1,500 women farmers 1% DAP	Age, differently abled persons (DAP) and county	Monitoring reports, and group records. Beneficiary contact monitoring reports.	Tallying- from project progress reports Quantitative analysis- the proportion of women investing and participating in CSA.

Evaluation questions	Results chain	Performance indicators, baselines and targets	Disaggregation	Data source (MOV)	Data Collection and method of Analysis
Evaluation Method Difference in Difference					
		1.2.3. Number of women with leadership skills to participate in CSA and CCA decision-making Target: Baseline: 960 farmers (women)	Differently abled persons (DAP) and county	Participant lists from CSA policy meetings. Activity tracking reports. Leadership skills assessment report. Beneficiary contact monitoring reports.	Tallying, document review Quantitative analysis- the proportion of women trained on leadership and participation in CSA and CCA decision making.
		1.2.4. Number of radio programmes developed and aired on women investing and participating in CSA Baseline: 0 Target: 9 radio programmes	County	Activity reports by implementing partners (including Radio programs schedule)	Tallying - from progress reports
		1.2.5. Number of local radio stations supported with gender policy Baseline: 0 Target: 3 local radio stations	County	Activity reports by implementing partners	Tallying - from progress reports
Did the WEE-CSA increase agricultural production, income levels, nutrition status and climate resilient livelihoods among the targeted communities?	2. To increase production, income levels, nutrition, and climate-resilient livelihoods among targeted communities	2. Percentage change in agricultural production (Legumes (tons/ha); Cereals (tons/ha); Fodder (tons/ha); Small ruminants (average number of animals per year and/or annual milk production per animal); Poultry (average number of birds per year and/or eggs/hen/year); Honey (kg/hive/year)) **Baseline: TBD** (0.2t/ha -> 2t/ha) Target: TBD	County, sex of principal beneficiary	Baseline survey (and if funds allow end-line survey to be considered) and beneficiary-based household surveys	Quantitative survey data and analysis- the ratio of total production to the total area harvested/planted for all crop value chains.

Evaluation questions	Results chain	Performance indicators, baselines and targets	Disaggregation	Data source (MOV)	Data Collection and method of Analysis
Evaluation Method Difference in Difference					
	2.1. Increased technical capacity of women farmer groups to adopt market-driven CSA value chains	2.1.1. Number of extension agents with an understanding of Gender-responsive practices and CSA skills Baseline: Target: 30 extension agents (Baseline in each county is 3, project targets 10 per county)	County, age, sex	Knowledge test results on gender-responsive practices and CSA skills	Tallying - from progress reports
		2.1.2. Number of women engaged in agro-enterprises Baseline: 0 Target: Every year, in each county, at least 70 women	County, age, sex, DAP	Training records, business records	Tallying- from project progress reports Quantitative analysis- proportion of women engaged in agro-enterprises
		2.1.3. Number of farmers utilizing CSA technologies Baseline: 0 Target: 2,400: 2000 F, 400 M farmers (At least in year one 300 women in 3 counties have adopted CSA e.g. vegetable gardens, poultry, DTC crops – sorghum, green grams etc. Thereafter in each county adoption is by at least 30% women)	County, age, sex, DAP	Performance tracking report & triangulated using beneficiary-based surveys	Tallying- from project progress reports Quantitative analysis of survey data - proportion of women utilizing CSA

Evaluation questions	Results chain	Performance indicators, baselines and targets	Disaggregation	Data source (MOV)	Data Collection and method of Analysis
Evaluation Method Difference in Difference					
		2.1.4. Number of agricultural technologies adopted Baseline: 3 CSA practices adopted by target groups (DTC and poultry, goats, fodder/agroforestry) in each county Target: 5-10 CSA practices shall be observed among the 10% of the beneficiaries in each county, each year.	County,	Performance tracking report & triangulated using beneficiary-based surveys	Tallying - from the project progress report Quantitative analysis of survey data- Count of the number of CSA practices adopted by the targeted community
	2.2. Women's capacity strengthened to invest and participate in land and water management committees on use of climate-resilient practices to rehabilitate degraded range land	2.2.1. Area (in Hectares) of farm-land under CSA practices Baseline: Target: 768 ha (65% Women cultivating 1/8th Ha plots in Y2 (195Ha), 90% women cultivating 1/8th Ha plots in Y3 (270Ha) and 50%women cultivating 1/4th Ha plots in Y4 (303Ha).	County	Performance tracking report	Tallying - from the project progress report Quantitative analysis of survey data-total area (Ha) under CSA per household with a project beneficiary.
		2.2.2 Number of improved CSA practices (12) Baseline: 0 Target: 12	County	Activity tracking reports.	Tallying - from the project progress report Quantitaive survey data and analysis-Count of number of CSA practices per beneficiary.

Evaluation questions	Results chain	Performance indicators, baselines and targets	Disaggregation	Data source (MOV)	Data Collection and method of Analysis
Evaluation Method Difference in Difference					
		2.2.3. Number of women benefitting from water harvesting structures Baseline:0 Target: 200 women (9 farm-ponds per county supporting at least 150 women to manage tree seedlings and vegetable plots; 48 water storage tanks (1000lt capacity each) supporting 50 women in managing tree seedlings and vegetable plots; 50% of beneficiaries have their farms with soil and water conservation structures.)	County, age, DAP	Activity tracking reports	**Tallying** - from the project progress report **Quantitative survey data analysis -** proportion of women benefiting from water harvesting structures.
	2.3. Increased capacity of women value chain actors to access financial services at county and community level	2.3.1. Number of women trained on CSA financial services Baseline: 0 Target: 1,000 women (At least 20 women in each of the 48 group have skills in CSA financial services)	County, age, DAP	Training records	Tallying - from the project progress report. Quantitative survey data analysis - proportion of women trained on CSA financial services.
		2.3.2. Number of women groups aggregating produce along value chain Baseline: Target: 9 women groups (3 groups, per county, each has a small cereal crop motorized thresher; 3 groups, per county,	County, age, value chain	Group records	Tallying - from the project progress report. Quantitative survey data analysis - proportion of women reproting aggregation of produce along the value chains they practice.

Evaluation questions	Results chain	Performance indicators, baselines and targets	Disaggregation	Data source (MOV)	Data Collection and method of Analysis
Evaluation Method Difference in Difference					
		each has an egg incubator)			

Annex 5: Sample Size and Sampling

Sampling process

The end-line used the same sample obtained during the baseline survey. Information regarding the groups reached, membership, and location (wards) was extracted from the secondary sources with the help of the county project staff. During the baseline survey, the project implementation reached 107 groups- Kitui 40 groups in Athi, Kauw'i, and Mutomo wards and composed of 971 members. In Laikipia, 40 groups in Mukogodo East, Tigithi, and Umande wards composed of 975 members, and in West Pokot 27 groups in Batei, Riwo, and Suam wards composed of 809 members.

A sample of 107 groups was obtained from the project records by UN Women and submitted to the consultant for sampling. A random sample size of 65 groups were determined by assuming a 5-member representation in the 365-sample size. The 65 groups were randomly selected from the 107 groups that benefited from the project proportionate to the number of groups in each county. Since there was no listing of the group members, the random selection of the respondent members was left to the chairpersons of the groups who were conducted to identify 5 members from their groups randomly.

Consequently, groups in the comparison wards were identified and profiled. 12 comparison groups were identified in Laikipia, 18 in West Pokot and 7 in Kitui. The case of non-beneficiary groups was however, different since there was no matching number of groups. In a similar approach to the beneficiary group, chairpersons of the groups were conducted to identify members of the group to participate in the survey.

In both cases, chairpersons were guided to randomly select the group members and not necessarily to select their friends or favorites or easy-to-reach members. Available identified non-beneficiary groups were 12 in Laikipia, 18 in West Pokot and 7 in Kitui County. As such, the spread for the non-beneficiary group was 5 members per group in West Pokot, 10 members per group in Laikipia and 16 members per group in Kitui County.

Baseline and End-line Sample distribution

In the baseline, 613 out of 650 sample households were interviewed across the 3 counties during the baseline. In Kitui County, 206 households (69 comparison and 137 beneficiaries) constituting 34% of the overall sample size were reached and interviewed. In Laikipia County, a total of 232 households (66 comparison and 166 beneficiaries) constituting 38% of the total sample size were reached while in West Pokot County, 175 households (80 comparison and 95 beneficiaries) constituting 29% of the total sample households were interviewed. The 613 presented 94% of the total sample size, which was considered negligible to affect the parameters. Women constituted 87% of the households (group members) interviewed and was in line with the project's focus on women.

Sample Distribution- Baseline and End-line.

		Baseline Sample			End-line Sample		
County	Ward	Comparison	Beneficiaries	Total	Comparison	Beneficiaries	Total
	Athi		35	35		31	31
	Kauw'i		72	72		53	53
	Mutomo		30	30		26	26
Kitui	Ikutha	19		19	18		18
	Kanziko	20		20	16		16
	Kithumula/Mutonga	30		30	23		23
	Total	**69**	**137**	**206**	**57**	**110**	**167**
	Batei		35	35		33	33
	Riwo		37	37		35	35
	Suam		23	23		17	17
West Pokot	Chepararia	38		38	32		32
	Kapenguria	17		17	17		17
	Kodich	25		25	22		22
	Sub-Total	**80**	**95**	**175**	**71**	**85**	**156**
	Nanyuki	23		23	17		17
	Thingithu	43		43	39		39
Laikipia	Mukongodo East		93	93		83	83
	Tigithi		36	36		25	25
	Umande		37	37		30	30

	Sub-Total	**66**	**166**	**232**	**56**	**138**	**194**
	All Sample	**215**	**398**	**613**	**184**	**333**	**517**
Unmatched					**19**	**7**	
Matched cases					**166**	**326**	**492**
Attrition					**23%**	**18%**	**19%**

Data Quality Checks

- **Timeliness**, the data was collected within the right timeframe- at baseline (at the time the project was starting or had just started) and at the end-line, when the project was at the closing stages. By this timing, the data collected represented an up-to-date representation of the context in the project implementation sites.
- **Uniqueness** - Out of the 613 data entries or cases submitted during the baseline, there were only three (3) duplicates. This meant that the true data entries were 610. Duplicates were identified through an Excel function of the raw data and excluded from the evaluation analysis. On combining the baseline and end-line data, duplicates were necessary and were identified as a match of the respondents between the baseline and end-line to create data akin to a two-time panel data that would allow for before and after comparison or differencing of the quantitative indicators.
- **Accuracy** – The accuracy of the data was ensured through several measures. Initial steps entailed designing data collection tools that were not ambiguous and easy for the respondents. In cases where dummy or categorical data was required, the Kobo-Collect forms were designed to allow for these unique responses. Conditional responses across the questions were also designed to be answered on condition that the primary question was respondent to. In cases where responses were extreme, moderation was considered during analysis. Often, such responses especially in prices and quantities were replaced with median values. These measures ensured, in part, a greater deal of accuracy in the responses. Such an attempt ensured that the data correctly reflected the real context of events for analytical purposes.
- **Consistency –** the data was collected in two phases (baseline and end-line). Thus, it required that cases be consistent over the two-time period as this presented a two-panel data system. Once the two panels were combined., consistency checks in selected variables was made. For example, the age variable of the respondent needed to be two years in difference since the baseline was in August 2022 and the end-line in April 2024 giving an average age difference of about 2 calendar years. A farmer who was interviewed at the baseline and end-line and was 44 years old would be 46 years old at the end-line. Time-invariant variables such as education, sex, and location were also examined to ensure that consistency was observed.
- **Validity –** this entailed checking whether the data conformed to the required formats, values, and standards. The data was downloaded in Excel format from the Kobo-Collect account. The Excel format allowed for upload in STATA for cleaning and analysis after the identification of matching cases between the baseline and end-line files. The names of the respondents were matched. For example, the sample at baseline had not been fed into the online Kobo-Collect account for the end-line evaluation. As such, the enumerators typed the names of the respondents although the typing in the form of case sensitivity and on arrangements of names would differ between the baseline and end-line file. This was cleaned up by matching the names of the respondents through duplicate identification and similarity in names, and location (ward, County, and group name). Being a tedious and time-consuming undertaking, future DiD exercises should endeavor to have a fixed record of the names of respondents once a sample is identified.

Annex 6: KII and FGD Checklists

KII- Extesnion officers and ToTs | M&E and IPs | SMT -FAO | SMT UN Women | FGD- Groups

Annex 7: Graphical Assessment of the parallel trend assumption

In order to evaluate the parallel trend assumption, one needs to have a panel of data that existed before the start of the project. To provide visualizations that can be used to evaluate the parallel trends assumption, data on the outcomes of interest- in this case, agricultural productivity (crops and livestock), and household income, was collected through recall for seasons in 2020 (long and short rains) and in 2021 (short rains) and 2022 (long rains). The short rains occur between October and December while long rains between March and June. These two rain seasons characterize the three counties in which the WEE-CSA program is being implemented.

Crop productivity was estimated as a ratio between the crop output (kilograms) and area (acres) per season and a trend developed from the four seasons in which the data was captured. For the crops, numerous value chains were captured. These were beans, bulb onions, fodder and pastures, green grams, vegetables (indigenous, kale, and spinach), and Irish Potatoes. Livestock-related value chains that were targeted by the WEE-CSA project are dairy goat, Indigenous poultry, meat goat (Galla goat), and honey (apiculture). In addition, products of the poultry value chain –eggs and milk from the dairy goats were also captured as separate products. This is because households usually sell and make a profit from eggs and milk instead of selling live goats or chickens. The productivity in livestock was captured as the number of livestock per household per year. Eggs were counted by a number of eggs produced per household per year, milk from dairy as the number of liters per household per year, and honey was estimated as the kilograms per beehive per year. Table 27 shows the value chains, the estimation of productivity, and the season or year for which the data was captured.

Table 27: Value Chains, Estimation of Productivity

Value chain	Estimation of productivity	Year/Season for which data was captured
Crops productivity (beans, bulb-onions, fodder and pasture, green grams, potatoes and vegetables)	Ratio of production (Kilograms) per unit area (acre)	Seasons: 2020 Short Rains Season 2020 Long Rain Season 2021 Short Rain Season 2022 Short Rains Season
Livestock (dairy goats, meat goats (Galla goat), poultry)	Number per household per year	Year 2020 and 2021
Milk from dairy goat	Liters per household per year	Year 2020 and 2021
Eggs	Number per household per year	Year 2020 and 2021
Honey	Kilograms per hive	Year 2020 and 2021

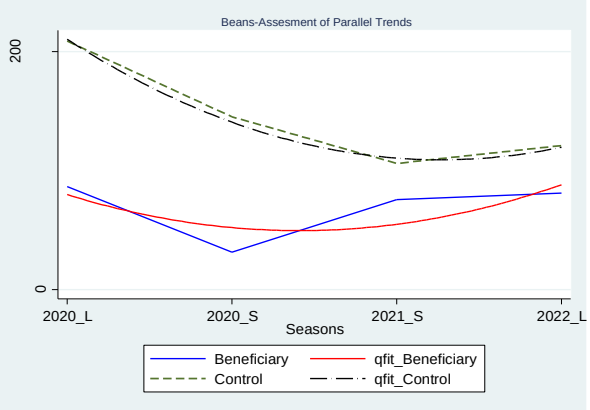
Visualization of the trends was developed over the four seasons (short rainfall 2020, long-rainfall 2020, short rains 2021 and long rains 2020) for the crops and for 2020 and 2021 for livestock related value chains- Table 28. The livestock were captured over the two times because their production does not usually follow the seasonal production like does the crop value chains.

Table 28: Assessment of parallel trend assumptions

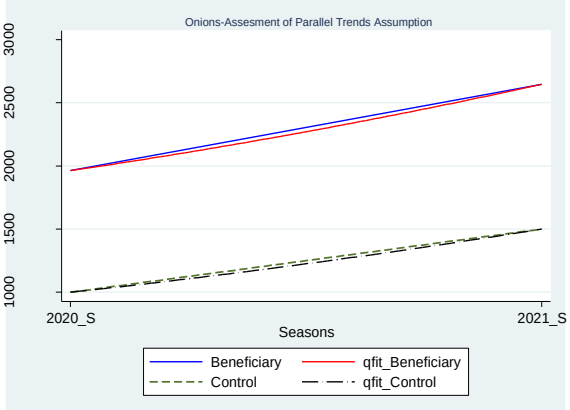
Value chain	Parallel trend evaluation	**Interpretation**
Crops Value Chain		
Beans	Holds	DiD estimates true intervention impact
Bulb onions	Holds	DiD estimates true intervention impact
Fodder and pastures	Indeterminate (no sufficient data)	
Green grams	holds	DiD estimates true intervention impact
Potatoes	Does not hold	DiD Likely to over/underestimate intervention impact
Vegetables	Holds	DiD estimates true intervention impact

Livestock Value Chains		
Dairy goat	Does not hold	DiD Likely to over/underestimate intervention impact
Milk (from dairy goat)	Does not hold	DiD Likely to over/underestimate intervention impact
Doper sheep	Does not hold	DiD Likely to over/underestimate intervention impact
Galla goat (meat goat)	Holds	DiD estimates true intervention impact
Poultry	Holds	DiD estimates true intervention impact
Eggs	Holds	DiD estimates true intervention impact
Honey	Holds	DiD estimates true intervention impact

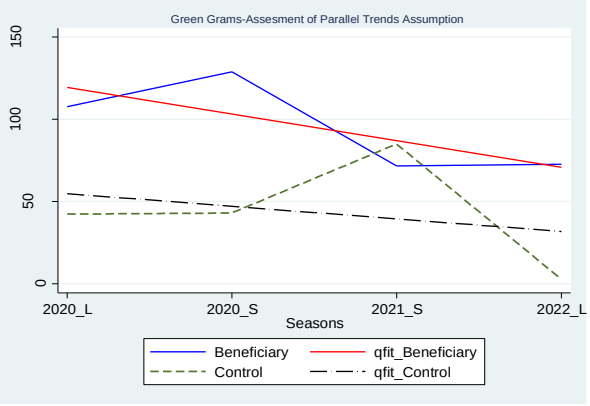
Beans



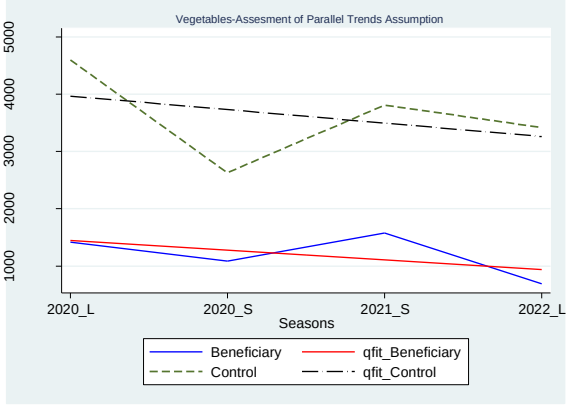
Bulb onions



Green Grams

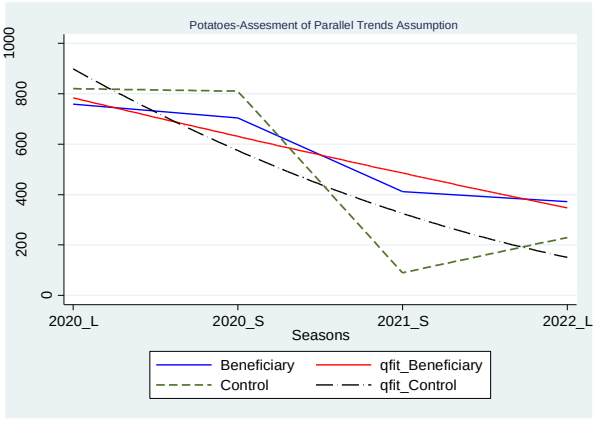


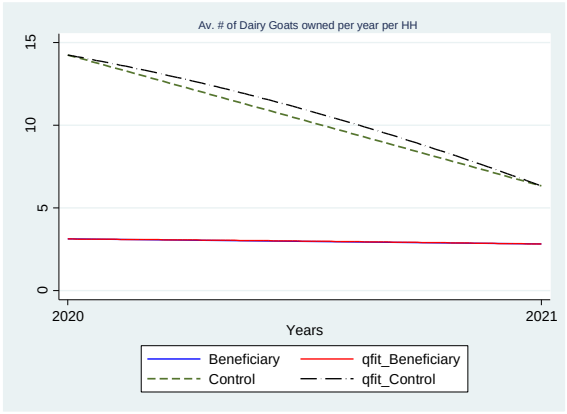
Vegetables



Irish Potatoes

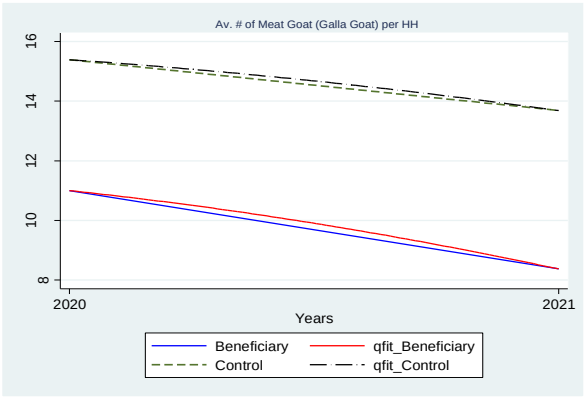
Dairy goats

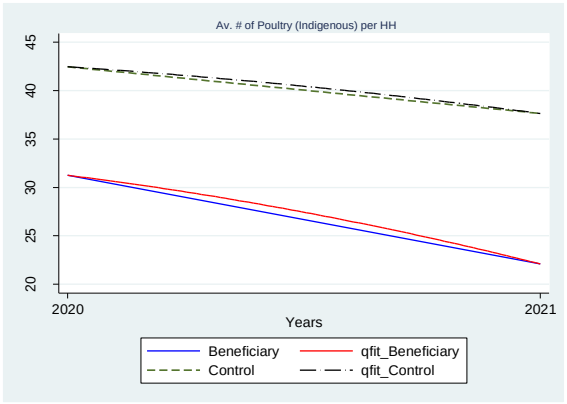




Meat Goats

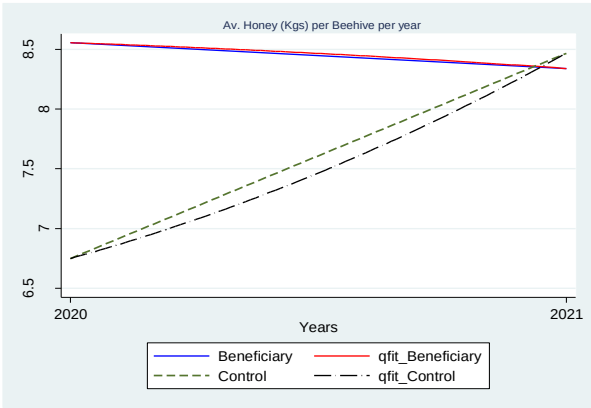
Poultry (indigenous)

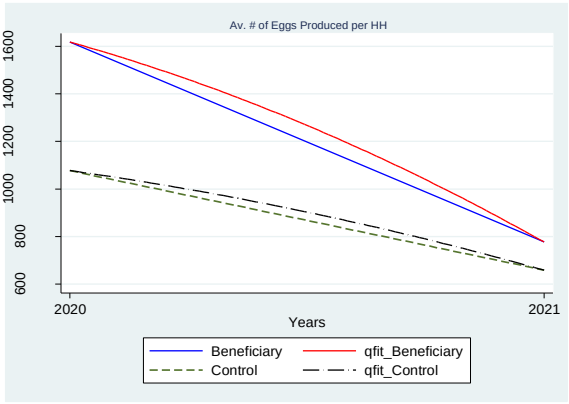




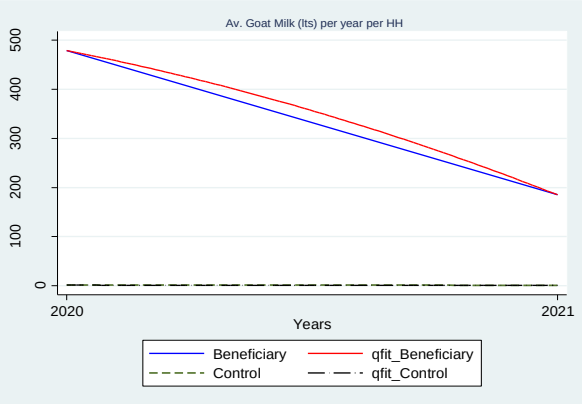
Honey

Eggs





Goat milk



Annex 8: Variables used in the computation of household resilience

Resilience Pillar	Variables description	How the variable is measured
Adaptive Capacity (AC)	Education level of head of household-Number of years of schooling (Never attended=0; Primary level=8; Secondary Level=12; Technical Level=15; and University level=16)	Measured Year of Education
	Dependency Ratio: The ratio between the total number of household members below 15 years or above 65 to the number of household members between 15 and 65 years.	Ratio
	Number of value chains the household is practicing	Number
	Average distance in KM to the nearest market where they sell the farm or livestock produce. Calculated as the average distance from home to the nearest market for households by county.	Measured as the distance (KM) taken to arrive at the nearest market center.
	Distance in KM to the nearest water point-Wet seasons	Measured as the distance (KM) taken to arrive at the nearest water point during Wet season.
	Distance in KM to the nearest water point-Dry seasons	Measured as the distance (KM) taken to arrive at the nearest water point during Dry season.
	Amount of group credit accessed (KES)	Amount (KES)
	Income diversification	Count of income sources
Social Safety Nets (SSN)	Received cash transfers in the last 12 months	Measured as a dummy [1=if yes; 0 otherwise]
	Received food aid in the last 12 months	Measured as a dummy [1=if yes; 0 otherwise]
	Remittances	Measured as a dummy [1=if yes; 0 otherwise]
	Social security benefits	Measured as a dummy [1=if yes; 0 otherwise]
	Social Assistance	Measured as a dummy [1=if yes; 0 otherwise]
	Member of Water harvesting and Conservation group	Measured as a dummy [1=if yes; 0 otherwise]
Access to Basic Services (ABS)	Has access to safe water sources for domestic consumption	Measured as a dummy [1=if yes; 0 otherwise]
	Average distance in KM to the nearest market where they sell the farm or livestock produce. Calculated as the average distance from home to the nearest market for households by county.	Measured as the distance (KM) taken to arrive at the nearest market center.

Resilience Pillar	Variables description	How the variable is measured
	distance in KM to the nearest water point-Wet seasons	Measured as the distance (KM) taken to arrive at the nearest water point during Wet season.
	distance in KM to the nearest water point-Dry seasons	Measured as the distance (KM) taken to arrive at the nearest water point during Dry season.
	Dependency Ratio: The ratio between the total number of household members below 15 years or above 65 to the number of household members between 15 and 65 years.	Ratio
	Income diversification	Count of income sources
Assets (AST)	Size of land (acres) owned by the household	Size of land (acres)
	Number of poultry (indigenous/Improved Kienyeji)	Number

Annex 9: Variables used in computation of WOmen Economic empowerment index

Variable	Description	How the variables are captured
Women Decision Index (WDI)	**Principal component index – women decision-** Women participation in at least one decision-making in utilization of income from any of the crops and livestock and livestock products. WEE-CSA targeted value chains (beans, onions, green grams, potatoes, vegetables, Galla goat, dairy goat, milk from the dairy goats, poultry, eggs, and honey), responses categorized as (1=husband, 2=spouse, 3=joint (husband and spouse), 4=other male and 5=another female) for	Dummy Composite (Women_ Decision=1 or 0)
	No of years of education of the household head	# of years
Gender Voice Index (GVI)	Women can voice against cultural practices that prevent women from crops production	Measured as a dummy [1=if aware; 0 otherwise
	Women can voice against cultural practices that prevent women from livestock production	Measured as a dummy [1=if aware; 0 otherwise
	Received gender mainstreaming message	Measured as a dummy [1=if aware; 0 otherwise
Awareness to Climate Change and participation in gender policy-making (GCC)	Aware of challenges to climate change	Measured as a dummy [1=if aware; 0 otherwise
	Aware of existence of Climate Change Committee in their locality	Measured as a dummy [1=if aware; 0 otherwise
	Participation in climate change decision making	Measured as a dummy [1=if participated; 0 otherwise
	Aware of any Climate Change Action (CCA) policies developed by the government	Measured as a dummy [1=if aware; 0 otherwise
	Able to demand from the elected leaders to account on how they are discharging their functions in relation to Climate Change Action (CCA) Management (e.g. MCAs, MPs)	Measured as a dummy [1=if able; 0 otherwise
	Able to access government information on the budgets (information on resources available for their community)	Measured as a dummy [1=if able; 0 otherwise
	Participation in the previous year (July 2021 – June 2022) in the national government's planning and budget process (Public Participation)	Measured as a dummy [1=if participated; 0 otherwise
	Aware of Gender policy developed by the National or County government?	Measured as a dummy [1=if aware; 0 otherwise
	Participation in the development of the county gender policy	Measured as a dummy [1=if participated; 0 otherwise

Variable	Description	How the variables are captured
Capacity building (CAP)	Training in leadership and in financial management skills	Measured as a dummy [1=if aware; 0 otherwise
Participation in markets for the selected value chains (COM)	Participation in markets through selling farm produce or livestock or livestock products	Measured as a dummy [1=if aware; 0 otherwise
Credit (individual and group)	If accessed credit as an individual or as a group	Measured as a dummy [1=if aware; 0 otherwise
Land ownership	Land ownership through title deed	Size of land owned with title deed

Annex 10: Attrition tests

	Area	Beans	Potatoes	Poultry	Eggs	Meat	Honey	Poverty	FIES (Food Insecurity Experience S				Resilience	WEI_CC
									Mild	Moderate	Severe	Mod+Sev		
Area	-.209													
	(1)													
County														
2.County	.058			-1.065				.25	.263	.215	.221	.263	.07	.216
	(.602)			(.835)				(.284)	(.292)	(.283)	(.294)	(.292)	(.415)	(.282)
3.County	.165							.622**	.604**	.581**	.584**	.604**	.805**	.588**
	(.753)							(.281)	(.279)	(.277)	(.28)	(.279)	(.345)	(.279)
Gender	.355		-1.596					.235	.244	.246	.25	.244	-.022	.287
	(.53)		(1.276)					(.254)	(.254)	(.253)	(.253)	(.254)	(.394)	(.256)
Age	-1.019	-.832	12.276	-1.775	2.252			-.023	-.025	-.015	-.013	-.025	-.315	.004
	(.836)	(2.004)	(8.727)	(1.501)	(5.529)			(.358)	(.356)	(.356)	(.357)	(.356)	(.452)	(.355)
HH_size	-1.632**	-1.847	-9.347	2.122	7.498	-.353		-.203	-.259	-.235	-.243	-.259	-.015	-.266
	(.691)	(1.669)	(7.414)	(1.746)	(9.356)	(2.854)		(.363)	(.358)	(.358)	(.36)	(.358)	(.513)	(.358)
Beans		-2.466												
		(2.23)												
Potatoes			-3.313											
			(2.276)											
Poultry				-.708										
				(.589)										
Eggs					-.451									
					(.625)									
Meat						.233								
						(.534)								
Honey							1.286							
							(1.974)							
Poverty								.314						
								(.327)						
FIES_Mild									-.122					
									(.25)					
FIES_Moderate										.138				
										(.247)				
FIES_Severe											-.008			
											(.211)			
FIES_Mode+Seve												.122		
												(.25)		
Resilience													-.045	
													(1.087)	
WEI_CC														-.834
														(.752)
_cons	4.545	5.881	-31.505	4.281	-21.817	-1.58	-3.226	-1.575	-1.407	-1.513	-1.481	-1.529	-.902	-1.439
	(3.673)	(9.947)	(23.409)	(5.772)	(35.232)	(6.092)	(4.653)	(1.52)	(1.516)	(1.511)	(1.51)	(1.512)	(1.891)	(1.516)
Observations	300	24	14	58	31	28	3	517	517	517	517	517	379	517
Pseudo R^2	.169	.144	.516	.5	.197	.023	.183	.037	.033	.034	.032	.033	.096	.041

*Standard errors are in parentheses; *** p<.01, ** p<.05, * p<.1*

Annex 11: Results Framework and Indicators

			Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
FIES	Beneficiaries	FIES Mild	326	326	18%	35%	-0.17	0.03	-5.1	0.000
		FIES Moderate	326	326	17%	23%	-0.07	0.03	-2.15	0.031
		FIES Severe	326	326	66%	42%	0.24	0.04	6.3	0.000
		FIES Moderate + Severe	326	326	83%	65%	0.17	0.03	5.1	0.000
# of Months of Food Gaps	No of Months of Food gaps	No of Months of Food gaps	325	326	5	2	2.68	0.19	14.05	0.000
Household Income	Beneficiaries	Kitui	109	109	109,752	82,807	26,945	12,916	2.1	0.038
		Laikipia	135	134	80,719	149,069	(68,350)	13,532	-5.05	0.000
		West Pokot	82	83	89,134	168,221	(79,087)	18,001	-4.4	0.000
		All	326	326	92,543	131,790	(39,247)	8,641	-4.55	0.000
Poverty	Beneficiaries	Kitui	109	109	15%	4%	0.11	4%	2.85	0.005
		Laikipia	135	134	5%	22%	-0.172	4%	-4.2	0.000
		West Pokot	82	83	1%	2%	-0.012	2%	-0.55	0.570
		All	326	326	7%	11%	-0.037	2%	-1.65	0.105
Resilience	Beneficiaries	Kitui	89	77	0.33	0.27	0.07	0.02	3.55	0.00
		Laikipia	91	88	0.30	0.29	0.01	0.02	0.7	0.47
		West Pokot	58	62	0.39	0.38	0.01	0.02	0.45	0.65
		All	238	227	0.34	0.31	0.03	0.01	2.55	0.01
Women Economic Empowerment Index	Beneficiaries	Kitui	109	109	0.09	0.28	-0.19	0.02	-8.3	0.00
		Laikipia	135	134	0.09	0.12	-0.03	0.01	-2.35	0.02
		West Pokot	82	83	0.20	0.20	-0.01	0.06	-0.1	0.90
		All	326	326	0.12	0.19	-0.08	0.02	-4.3	0.00
Productivity All Counties (Beneficiaries)		Beans	15	25	0.21	0.43	-0.21	0.082	-2.6	0.014
		Onions	20	17	4.72	3.62	1.09	1.39	0.8	0.439
		Fodder	1	1	0.01	0.22	-0.21	.	.	.
		Grams	19	34	0.26	0.39	-0.13	0.099	-1.3	0.209
		Potatoes	6	18	1.70	1.85	-0.16	0.614	-0.25	0.805
		Dairy goat	8	37	3	10	-6.77	2.377	-2.85	0.007
		Vegetables	6	19	3.4	5.8	-2.41	2.958	-0.8	0.424
		Milk	8	15	168	95	72.58	49.524	1.45	0.158
		Doper	6	11	39	15	23.89	6.453	3.7	0.009
		Meat goat	17	40	11	21	-9.26	3.163	-2.95	0.007
		Poultry	88	98	32	232	-200.2	40.196	-5	0.000
		Eggs	24	32	1931	9445	(7,514)	4,956	-1.5	0.140
		Honey	4	22	11	12	-1.62	7.064	-0.25	0.827
Productivity (Beneficiaries)	Indigenous vegetables e.g., Managu (black nightshade), spider flower									
	Tons/Ha	Kitui	3	19	0.6	5.8	-5.24	2.36	-2.20	0.04
		Laikipia		5	1.6	*--		0.88	-0.85	4.06
		West Pokot	*--	*--	*--	*--	*--	*--	*--	*--
		All Counties	6	19	3.4	5.8	-2.41	2.96	-0.80	0.424
	Green grams- – Tons/Ha	Kitui	19	34	0.3	0.4	-0.13	0.10	-1.30	0.209

			Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
	Irish potatoes- – Tons/Ha	Laikipia	6	18	1.7	1.9	-0.16	0.61	-0.25	0.805
	Bulb onion -– Tons/Ha	West Pokot	20	17	4.7	3.6	1.09	1.39	0.80	0.439
	Poultry (Meat Production)									
	Number of live animals owned during the reference period (Av. #/Year/hh)	Kitui	46	36	26	151	-125.4	16.7	-7.50	0.00
		Laikipia	40	42	40	66	-26.1	19.7	-1.30	0.19
		West Pokot	2	20	18	727	-709.7	145.1	-4.90	0.00
		All Counties	88	98	32	232	-200.2	40.2	-5.00	0.00
	Poultry (Eggs Production)									
	Number of eggs produced during the reference period (Av. #/Year/hh)	Kitui	3	14	723	10,388	(9,665)	6,231	-1.55	0.144
		Laikipia	21	17	2,103	8,694	(6,591)	7,926	-0.85	0.418
		West Pokot	*--	*--	*--	*--	*--	*--	*--	*--
		All Counties	24	32	1,931	9,445	(7,514)	4,956	-1.5	0.14
	Goats (Meat Production – Galla Goats)									
	Number of live animals owned during the reference period (Av. #/Year/hh)	Kitui	15	20	9	23	-14	3.72	-3.90	0.00
		Laikipia	2	3	30	9	21	5.51	3.80	0.06
		West Pokot		17		20		1.49	16.42	22.75
		All Counties	17	40	11	21	-9	3.16	-2.95	0.01
	Goats (Milk Production)									
	Quantity (liter) of milk produced per goat during the reference period (Lts/year)	Kitui			16	68		40.1	-18	153.13
		Laikipia	8	8	168	164	3.604	71.585	0.05	0.961
		West Pokot	*--	*--	*--	*--	*--	*--	*--	*--
		All Counties	8	15	168	95	72.576	49.524	1.45	0.158
	Apiculture (Honey production)									
	(Kgs/Beehive/year)	Kitui		5		6.8		1.9	1.53	12.16
		Laikipia	4	14	10.7	7.6	3.129	6.326	0.5	0.651
		West Pokot	*--	*--	*--	*--	*--	*--	*--	*--
		All Counties	4	22	11	12	-1.621	7.064	-0.25	0.827
Number of farmers utilizing CSA technologies	Beneficiaries	Kitui	109	109	91%	90%	0.01	0.04	0.250	0.820
		Laikipia	135	134	70%	75%	-0.05	0.06	-0.900	0.362
		West Pokot	82	83	43%	48%	-0.06	0.08	-0.700	0.480
		All	326	326	70%	73%	-0.03	0.04	-0.850	0.387
Number of agricultural Practices/technologies (crops and livestock) adopted	Beneficiaries	Kitui	109	109	7	12	-4.825	0.52	-9.25	0.000
		Laikipia	135	134	6	7	-1.367	0.511	-2.7	0.008
		West Pokot	82	83	5	8	-3.086	0.68	-4.55	0.000
		All	326	326	6	9	-2.957	0.346	-8.55	0.000
Area (Ha) under CSA Technologies	Beneficiaries	Kitui	109	109	0.57	0.91	-0.336	0.1	-3.4	0.001
		Laikipia	135	134	0.04	0.02	0.022	0.012	1.95	0.055
		West Pokot	82	83	0.06	0.10	-0.044	0.031	-1.4	0.162
		All	326	326	0.22	0.34	-0.115	0.044	-2.65	0.009
1.1.4: Number of people reached with CSA gender mainstreaming messages	Beneficiaries	Kitui	109	109	13%	72%	-0.587	0.054	-10.85	0.000
		Laikipia	135	134	24%	28%	-0.047	0.053	-0.85	0.387
		West Pokot	82	83	52%	82%	-0.295	0.07	-4.2	0.000
		All	326	326	27%	57%	-0.291	0.037	-7.9	0.000
	Beneficiaries	Kitui	97	96	2%	24%	-0.219	0.046	-4.75	0.000

			Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
1.2.1. Number of women participating in the development and implementation of CSA		Laikipia	121	119	7%	9%	-0.018	0.036	-0.5	0.615
		West Pokot	70	72	16%	18%	-0.024	0.064	-0.35	0.712
		All	288	287	8%	16%	-0.088	0.027	-3.25	0.001
1.2.2. Number of women with leadership skills to participate in CSA and CCA decision-making	Beneficiaries	Kitui	68	91	3%	36%	-0.333	0.055	-6.1	0.000
		Laikipia	47	63	17%	21%	-0.036	0.075	-0.5	0.634
		West Pokot	47	65	19%	25%	-0.055	0.079	-0.7	0.491
		All	162	219	12%	28%	-0.166	0.04	-4.2	0.000
1.2.3. Number of women investing and participating in CSA	Beneficiaries	Kitui	97	96	2%	20%	-0.177	0.055	-3.25	0.002
		Laikipia	121	119	8%	6%	0.024	0.033	0.7	0.474
		West Pokot	70	72	37%	45%	-0.073	0.142	-0.5	0.607
		All	288	287	13%	20%	-0.07	0.044	-1.6	0.107
2.1.2a. Number of women engaged in agro-enterprises (at least marketing something from agro-enterprise)	Beneficiaries	Kitui	97	96	69%	84%	-0.153	0.06	-2.55	0.012
		Laikipia	121	119	46%	52%	-0.058	0.065	-0.9	0.370
		West Pokot	70	72	7%	35%	-0.276	0.065	-4.3	0.000
		All	288	287	45%	59%	-0.141	0.042	-3.4	0.001
2.1.2b.: Number of farmers utilizing CSA technologies	Beneficiaries	Kitui	109	109	91%	90%	0.009	0.04	0.25	0.82
		Laikipia	135	134	70%	75%	-0.05	0.055	-0.9	0.362
		West Pokot	82	83	43%	48%	-0.055	0.078	-0.7	0.48
		All	326	326	70%	73%	-0.03	0.036	-0.85	0.387
2.1.3. Number of agricultural Practices/technologies (crops and livestock) adopted	Beneficiaries	Kitui	109	109	7	12	-4.825	0.52	-9.25	0
		Laikipia	135	134	6	7	-1.367	0.511	-2.7	0.008
		West Pokot	82	83	5	8	-3.086	0.68	-4.55	0
		All	326	326	6	9	-2.957	0.346	-8.55	0
2.2.2 Number of improved CSA practices (12)	Beneficiaries	Kitui	109	109	3	4	-1.046	0.26	-4.05	0
		Laikipia	135	134	2	2	0.061	0.196	0.3	0.755
		West Pokot	82	83	1	1	-0.315	0.218	-1.45	0.15
		All	326	326	2	2	-0.402	0.145	-2.75	0.006
2.2.3. Number of women benefitting from water harvesting structures	Beneficiaries	Kitui	97	96	64%	93%	-0.288	0.056	-5.150	0.000
		Laikipia	121	119	77%	90%	-0.131	0.048	-2.750	0.007
		West Pokot	70	72	20%	65%	-0.453	0.183	-2.500	0.015
		All	288	287	59%	85%	-0.26	0.055	-4.700	0.000
Output Indicator 2.3.1: Number of women trained on CSA financial services	Beneficiaries	Kitui	97	96	70%	81%	-0.112	0.061	-1.800	0.072
		Laikipia	121	119	39%	45%	-0.057	0.064	-0.900	0.373
		West Pokot	70	72	73%	74%	-0.007	0.075	-0.100	0.920
		All	288	287	58%	64%	-0.065	0.041	-1.600	0.112
2.3.2. Number of women groups aggregating produce along value chain	Beneficiaries	Kitui	97	96	35%	85%	-0.504	0.060	-8.300	0.000
		Laikipia	121	119	41%	30%	0.111	0.061	1.800	0.074
		West Pokot	70	72	27%	58%	-0.312	0.080	-3.950	0.000
		All	288	287	36%	56%	-0.2	0.041	-4.900	0.000
Number of women investing and participating in CSA		aware			47					
		Investing			35					

		Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Agricultural production of beneficiaries (1 bags/acre - > 9 bags/acre)4				Crop: 2.4 tons/ha					
Number of extension agents (30) with understanding of Gender and CSA skills				13					
Number of women (1,200) engaged in agro-enterprises				2355					
Number of farmers (2,400: 2000 F, 400 M) utilizing CSA technologies	Female Male			47 100					
Number of agricultural technologies adopted				46					
Area of farmland under CSA practices (768ha)				91	113				
Number of improved CSA practices				6					
Number of women (200) benefitting of water harvesting structures				5					
Number of women (1000) trained on CSA financial services				12					
Number of women groups (9) aggregating produce along value chain	Kitui Laikipia West Pokot			3 2 5					
Group value chain specific production for last 12 months (KGs)				TBC					
Group sales for last 12 months (KES/USD)				9713					
Dues collected for last 12 months (KES) - NB: Dues is a periodic mandatory contribution by members to the group.									
Group savings (USD)				642					
Credit/loans issued to members (USD)				520					
Value of Assets owned by group				TBC					
Group value (USD) of re-investment				0					
Number of trees planted and are growing.				90					
Percentage of groups involved in selected value chains				16					
Number of group members (males and females) accessing loans				Males: 0 Females: 4					
Number of county government that implement a gender responsive system (laws polices) on CSA policies and strategies				0					
Number of County government staff who participate in specialized workshop (alignment of county development plans with national CSA/CCA policies)	Kitui Laikipia West Pokot			5 40 3					
Number of County government staff who participate in specialized workshop (gender-responsive CSA policies)	Kitui Laikipia West Pokot			5 4 3					
Number of people (6,000) reached with CSA gender mainstreaming messages	Female Male			40 100					
Number of guidelines developed (1)									

	Baseline (n)	End-line (n)	Baseline 2020	End-line 2024	dif	St Err	t value	p value
Number of women groups participating in the development and implementation of CSA			TBD[3]					
Number of women with leadership skills to participate in CSA and CCA decision-making			67					

Annex 12: DiD STATA SCRIPT


```
clear
clear mata
set memory 1g,
macro drop _all
constraint drop _all
set more off
use " DID.dta", clear

sort Member_name Time
gen ln_HH_size=ln(q_212+1)
gen ln_Member_Age=ln(Member_Age+1)
rename Tot_CSA_Area Area
rename Productivity_Veges Vegetables
rename Productivity_Beans Beans
rename Productivity_Grams Greengrams
rename Productivity_Potatoes Potatoes
rename Productivity_Onions Onions
rename Productivity_Poultry Poultry
rename Productivity_Eggs Eggs
rename Productivity_Meat Meat
rename Productivity_Honey Honey
rename Productivity_Milk Milk
rename HH_poverty Poverty

tab County, gen(County_ )
rename County_1 County_Kitui
rename County_2 County_Laikipia
rename County_3 County WestPokot
replace County="1" if County=="Kitui"
replace County="2" if County=="Laikipia"
replace County="3" if County=="WestPokot"
destring County, replace
*replace Sale_Dorper="." if Sale_Dorper=="other"
destring Sale_Dorper, replace
gen ln_Foodgaps=ln(Foodgaps_2023+1)
qui foreach var of varlist Sale_* {
recode `var' (.=0)
gen ln_`var'=ln(`var'+1)
}
```

```
gen ln_Age_member=ln(Member_Age+1)
gen ln_Area=ln(Area+1)

global Productivity "HH_inco Vegetables Beans Greengrams Potatoes Onions Poultry Eggs Meat Honey Milk"
foreach var of global Productivity {
gen ln_`var'=ln(`var'+1)
}
/*********************************************************************
Testing attrition
*********************************************************************/
*ln_Vegetables
*ln_Greengrams
*ln_Onions
*ln_Milk

/*Paralel Trends holds for
Beans
Poultry
Bulb onions
Green grams
Vegetables
Galla goat (meat goat
Eggs
Honey
Beans    PotatoesPoultry   Eggs      Meat     Honey
*/
set more off
global px "ln_Area ln_Vegetables ln_Beans ln_Greengrams ln_Potatoes ln_Onions ln_Poultry ln_Eggs ln_Meat
ln_Honey ln_Milk"
foreach var of global px {
recode `var' (.=0)
sort Member_name Time
by Member_name: gen b_`var'=`var'[1]
*recode `var' b_`var' (0=.)
}

set more off
foreach var of varlist Poverty  FIES_Mild FIES_Moderate FIES_Severe FIES_Mode_Seve Resil_index WEI_CC  {
sort Member_name Time
by Member_name: gen b_`var'=`var'[1]
}

asdoc probit Attrition b_ln_Area i.County Gender ln_Age_member ln_HH_size if Time==1, nest replace
save(Attrition_test) stars cnames(Area)
asdoc probit Attrition b_ln_Beans i.County Gender ln_Age_member ln_HH_size if Time==1, nest append stars
cnames(Beans)
```

```
asdoc probit Attrition b_ln_Potatoes  i.County Gender ln_Age_member ln_HH_size if Time==1, nest append stars cnames(Potatoes)
asdoc probit Attrition b_ln_Poultry i.County Gender ln_Age_member ln_HH_size if Time==1, nest append stars cnames(Poultry)
asdoc probit Attrition b_ln_Eggs i.County Gender ln_Age_member ln_HH_size if Time==1, nest append stars cnames(Eggs)
asdoc probit Attrition b_ln_Meat  i.County   ln_HH_size if Time==1, nest append stars cnames(Meat)
asdoc probit Attrition b_ln_Honey i.County ln_HH_size if Time==1, nest append stars cnames(Honey)
asdoc probit Attrition b_Poverty i.County Gender ln_Age_member ln_HH_size if Time==1, nest append stars cnames(Poverty)
asdoc probit Attrition b_FIES_Mild i.County Gender ln_Age_member ln_HH_size if Time==1, nest append stars cnames(FIES_Mild)
asdoc probit Attrition b_FIES_Moderate i.County Gender ln_Age_member ln_HH_size if Time==1, nest append stars cnames(FIES_Moderate)
asdoc probit Attrition b_FIES_Severe i.County Gender ln_Age_member ln_HH_size if Time==1, nest append stars cnames(FIES_Severe)
asdoc probit Attrition b_FIES_Mode_Seve i.County Gender ln_Age_member ln_HH_size if Time==1, nest append stars cnames(FIES_Mode+Seve)
asdoc probit Attrition b_Resil_index i.County Gender ln_Age_member ln_HH_size if Time==1, nest append stars cnames(Resilience)
asdoc probit Attrition b_WEI_CC i.County Gender ln_Age_member ln_HH_size if Time==1, nest append stars cnames(WEI_CC)


drop if Attrition==1
/*********************************************************************/

set more off
gen P_end=Intervention==1 & Time==1
egen P_2024=max(P_end), by(Member_name)
gen DID= P_2024*Time
gen Treated=P_2024
gen DiD=DID
diff ln_Area, t(P_2024) p(Time)
diff ln_Area, t(Treated) p(Time)
reg ln_Area DID Treated Time
*xtreg ln_Area DID Treated Time, fe i(Member_name)

foreach var of varlist Area Beans Onions Greengrams Potatoes Vegetables Milk Meat Poultry Eggs Honey {
diff ln_`var', t(Treated) p(Time)
outreg2 using table_diff, ctitle(`r(depvar)') addstat(Mean control t(0), r(mean_c0), ///
Mean treated t(0), r(mean_t0), Diff t(0), r(diff0), Mean control t(1), r(mean_c1), ///
Mean treated t(1), r(mean_t1), Diff t(1), r(diff1)) label excel keep(_diff) nocons
}
```

```
foreach var of varlist Poverty FIES_Mild FIES_Moderate FIES_Severe FIES_Mode_Seve ln_HH_inco  Resil_index
WEI_CC  {
diff `var', t(Treated) p(Time)
outreg2 using table_diff, ctitle(`r(depvar)') addstat(Mean control t(0), r(mean_c0), ///
Mean treated t(0), r(mean_t0), Diff t(0), r(diff0), Mean control t(1), r(mean_c1), ///
Mean treated t(1), r(mean_t1), Diff t(1), r(diff1)) label excel keep(_diff) nocons
}

set more off
foreach var of varlist Area Beans Onions Greengrams Potatoes Vegetables Milk Meat Poultry Eggs Honey {
diff ln_`var', t(Treated) p(Time) cov(County_WestPokot ln_HH_size ln_Member_Age Disabled) report
outreg2 using table_diff, ctitle(`r(depvar)') addstat(Mean control t(0), r(mean_c0), ///
Mean treated t(0), r(mean_t0), Diff t(0), r(diff0), Mean control t(1), r(mean_c1), ///
Mean treated t(1), r(mean_t1), Diff t(1), r(diff1)) label excel keep(_diff) nocons
}

set more off
foreach var of varlist Poverty FIES_Mild FIES_Moderate FIES_Severe FIES_Mode_Seve Foodgaps_2023 ln_HH_inco
Resil_index WEI_CC  {
diff `var', t(Treated) p(Time) cov(County_* ln_HH_size ln_Member_Age Disabled) report
outreg2 using table_diff, ctitle(`r(depvar)') addstat(Mean control t(0), r(mean_c0), ///
Mean treated t(0), r(mean_t0), Diff t(0), r(diff0), Mean control t(1), r(mean_c1), ///
Mean treated t(1), r(mean_t1), Diff t(1), r(diff1)) label excel keep(_diff) nocons
}
```