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Report No: ICR00111

IMPLEMENTATION COMPLETION AND RESULTS REPORT
Credit No. 5900-KE

ON A

IDA CREDIT

IN THE AMOUNT OF (SDR142.6) MILLION
(US$ 200 MILLION EQUIVALENT)

TO
The Republic of Kenya

FOR
National Agricultural and Rural Inclusive Growth Project
January 31, 2025

Agriculture and Food
Eastern And Southern Africa

CURRENCY EQUIVALENTS

(Exchange Rate Effective {Aug 07, 2024})

Currency Unit =	Kenya Shilling (Ksh)
Ksh 130 =	US$1
US$1.33 =	SDR 1

FISCAL YEAR
January 1 - December 31

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ABBREVIATIONS AND ACRONYMS

ASALs	Arid and Semi-Arid Lands
ASDS	Agricultural Sector Development Strategy 2010–2020.
ASDS	Agricultural Sector Development Strategy 2010–2020
ASTGS	Agriculture Sector Transformation and Growth Strategy
ATO	Agriculture Transformation Office
B/C	Benefit/Cost
BCR	Benefit-Cost Ratio
CBFs	Community Based Facilitators
CDD	Community Driven Development approach
CDDCs	Community Driven Development Committees
CIDPs	County Integrated Development Plans
CIGs	Common Interest Groups
CO2-eq	Carbon Dioxide Equivalent
CPCU	County Project Coordination Unit
CPF	Country Partnership Framework
CPS	Country Partnership Strategy
CRF	County Revenue Funds
CSA	Climate-Smart Agriculture
CSAP	Climate-Smart Agriculture Program 2015–2030
CTD	County Technical Departments
CVCDCs	County Value Chain Development Committee
DATs	Disruptive Agricultural Technologies
EBCR	Economic Benefit Cost Ratio
EDG	Enterprise Development Grants
EDP	Enterprise Development Plan
EFA	Economic and Financial Analysis
ENPV	Economic Net Present Value
ERP	Enterprise Resource Planning
ERR	Economic Rate of Return
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESS	Environmental and Social Safeguards
EX-ACT	Ex-Ante Carbon Balance Tool
FAO	Food and Agriculture Organization
FBCR	Financial Benefit Cost Ratio
FCS	Food Consumption Score

FFS	Farmer Field Schools
FNPV	Financial Net Present Value
FPO	Farmer producer organization
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GHG	Greenhouse Gas
GoK	Government of Kenya
GRM	Grievance Redress Mechanism
ha	Hectare
ICRR	Implementation Completion and Results Report
IDA	International Development Agency
IFMIS	Integrated Financial Management Information System
ISR	Implementation Status & Results Reports
IRR	Internal Rate of Return
ISFM	Integrated Soil Fertility Management
KALRO	Kenya Agriculture and Livestock Research Organization
KCSAP	Kenya Climate Smart Agriculture Project
KES	Kenyan Shilling
KYEP	Kenya Youth Employment Project
M&E	Monitoring and Evaluation
MoALD	Ministry of Agriculture and Livestock Development
MoPD	Ministry of Devolution and Planning
MT	Metric ton
MTR	Mid-term Review
NAIP	National Agricultural Investment Plan
NAMAs	Nationally Appropriate Mitigation Actions
NARIGP	National Agricultural and Rural Inclusive Growth Project
NAVCDP	National Agricultural Value Chain Development Project
NCCRS	National Climate Change Response Strategy
NPCU	National Project Coordination Unit
NPV	Net Present Value
PAD	Project Appraisal Document
PCR	Project Completion Report
PDO	Project Development Objective
PIM	Project Implementation Manual
PIU	Project Implementation Unit
PMIS	Project Management Information System

PO	Producer Organization
RF	Results Framework
SACCOs	Savings and Credit Cooperatives
SCD	Systematic Country Diagnostic
SCF	Standard Conversion Factor
SER	Standard Exchange Ratio
SPA	Special Purpose Account
SPs	Service Providers
TIMPs	Technology Innovation Management Practices
US$	United States Dollars
VC	Value Chain
VMGs	Vulnerable and Marginalized Groups
WOP	Without Project
WP	With Project

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DATA SHEET

BASIC DATA

Product Information

Operation ID	Operation Name
P153349	National Agricultural and Rural Inclusive Growth Project
Product	Operation Short Name
Investment Project Financing (IPF)	E-National Ag. and Rural Inclusive Grow
Operation Status	Approval Fiscal Year
Closed	2017
Original EA Category	Current EA Category
Partial Assessment (B) (Approval package - 23 Aug 2016)	Partial Assessment (B) (Restructuring Data Sheet - 14 Apr 2023)

CLIENTS

Borrower/Recipient	Implementing Agency
The Republic of Kenya	MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT

DEVELOPMENT OBJECTIVE

Original Development Objective (Approved as part of Approval Package on 23-Aug-2016)

The proposed development objective is 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 immediate and effective response.

FINANCING

Financing Source	Original Amount (US$)	Revised Amount (US$)	Actual Disbursed (US$)
World Bank Financing	200,000,000.00	192,611,161.73	197,241,473.56
IDA-59000	200,000,000.00	192,611,161.73	197,241,473.56
Total	**200,000,000.00**	**192,611,161.73**	**197,241,473.56**

RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Type	Amount Disbursed (US$M)	Key Revisions
25-Jul-2017	Portal	0.60	• Legal Covenants • Clients
18-Jan-2022	Portal	147.30	• Components • Results • Loan Closing Date Extension • Reallocations
15-Jun-2022	Portal	160.82	• Reallocations
14-Apr-2023	Portal	197.23	• Loan Closing Date Extension • Procurement

KEY DATES

Key Events	Planned Date	Actual Date
Concept Review		26-Jan-2015
Decision Review	15-Dec-2015	15-Dec-2015
Authorize Negotiations	28-Jun-2016	28-Jun-2016
Approval	23-Aug-2016	23-Aug-2016
Signing	30-Sep-2016	14-Oct-2016
Effectiveness	31-Jul-2017	28-Jul-2017
ICR/NCO	28-Feb-2025	31-Jan-2025
Restructuring Sequence.01	Not Applicable	25-Jul-2017
Restructuring Sequence.02	Not Applicable	18-Jan-2022
Restructuring Sequence.03	Not Applicable	15-Jun-2022

Restructuring Sequence.04	Not Applicable	14-Apr-2023
ICR Sequence.01 (Final)	--	30-Jan-2025
Operation Closing/Cancellation	31-Mar-2024	31-Mar-2024

RATINGS SUMMARY

Outcome	Bank Performance	M&E Quality
Satisfactory	Satisfactory	Substantial

ISR RATINGS

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US$M)
01	22-Dec-2016	Moderately Satisfactory	Moderately Satisfactory	0.47
02	22-Jun-2017	Moderately Unsatisfactory	Moderately Unsatisfactory	0.60
03	29-Dec-2017	Moderately Unsatisfactory	Moderately Satisfactory	0.72
04	29-Jun-2018	Moderately Unsatisfactory	Moderately Satisfactory	12.72
05	04-Jan-2019	Moderately Satisfactory	Moderately Satisfactory	13.65
06	29-Jun-2019	Moderately Satisfactory	Moderately Unsatisfactory	30.19
07	14-Oct-2019	Moderately Satisfactory	Moderately Satisfactory	39.94
08	12-Apr-2020	Satisfactory	Moderately Satisfactory	79.72
09	19-Nov-2020	Satisfactory	Satisfactory	102.67
10	25-May-2021	Satisfactory	Satisfactory	134.24
11	17-Nov-2021	Satisfactory	Satisfactory	147.30
12	28-May-2022	Satisfactory	Satisfactory	160.82
13	26-Nov-2022	Satisfactory	Satisfactory	189.38
14	28-Jun-2023	Satisfactory	Satisfactory	197.23

SECTORS AND THEMES

Sectors

Major Sector	Sector	%	Adaptation Co-benefits (%)	Mitigation Co-benefits (%)
FY17 - Agriculture, Fishing and Forestry	FY17 - Agricultural Extension, Research, and Other Support Activities	32	50	50
	FY17 - Other Agriculture, Fishing and Forestry	37	0	74
	FY17 - Public Administration - Agriculture, Fishing & Forestry	7	43	47
FY17 - Industry, Trade and Services	FY17 - Agricultural markets, commercialization and agri-business	19	100	0
FY17 - Public Administration	FY17 - Sub-National Government	5	100	0

Themes

Major Theme	Theme (Level 2)	Theme (Level 3)	%
FY17 - Environment and Natural Resource Management	FY17 - Climate change	FY17 - Adaptation	43
		FY17 - Mitigation	47
FY17 - Private Sector Development	FY17 - Enterprise Development	FY17 - MSME Development	30
	FY17 - Jobs	FY17 - Job Creation	21
FY17 - Social Development and Protection	FY17 - Social Inclusion		39
FY17 - Urban and Rural Development	FY17 - Rural Development	FY17 - Rural Infrastructure and service delivery	64
		FY17 - Rural Non-farm Income Generation	39

ADM STAFF

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ICR Main Contributor	Chiwimbo Perseverance Mwika, Ghada Elabed	

I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

A. CONTEXT AT APPRAISAL

Country and Sectoral Context

1. **At the time of appraisal, Kenya was the fifth largest economy in sub-Saharan Africa after Nigeria, South Africa, Angola, and Sudan, with a gross national income per capita of US$1,330 in 2015**[1]. Despite a decline in poverty due to solid growth across most sectors of the economy, inequality was rising among people and across regions. Reducing poverty and increasing shared prosperity remained formidable challenges, particularly for the rural population. Vulnerable groups such as women and youth in rural areas bore the highest incidence of poverty. Poor agricultural performance had stymied poverty reduction even as the economy grew. Most of the poor lived in rural areas and depended on the agriculture sector for their sustenance and income[2].

2. **In 2010, Kenya adopted a new constitution with potential to address disparities and historical patterns of marginalization through a two-tiered system of national and county government**. The national government committed to devolve responsibility for multiple functions to 47 elected county governments. County governments became responsible for delivering agricultural services, while the national government retained a policymaking, regulatory, and research role. The ambitious devolution process brought new opportunities and challenges for increasing agricultural productivity and food security and reducing poverty.

3. **Agriculture, employing about half of the nation and contributing about 20 percent of GDP, was and remains a key economic driver crucial for poverty reduction and climate change adaptation**[3]**. However, the sector faced several challenges**. Most farmers (87 percent) had less than 2 ha of land with limited access to improved technologies, innovation, and management practices (TIMPs), and extension services. Most agriculture in Kenya was rain-fed, and vulnerable to climate change and land degradation. By 2030, under a business-as-usual scenario, climate change was expected to reduce crop yields (maize, rice, and wheat by 12, 23, and 13 percent, respectively) and impact cropland's ability to sustain maize and wheat production. Droughts had caused livestock losses exceeding US$ 1.08 billion, impacting households in Arid and Semi-Arid Lands (ASALs), where livestock production accounted for nine-tenths of employment and family income. With 91 percent of agricultural exports in raw or semi-processed form, Kenya also missed income opportunities by not adding value to its produce. Other sector constraints included poor rural infrastructure like small-scale irrigation, roads, marketing, and storage.

Rationale for Bank Involvement

4. **In this context, there was a strong rationale for World Bank engagement under the National Agricultural and Rural Inclusive Growth Project (NARIGP) to strengthen the government of Kenya's (GoK's) support for the agriculture sector.** The World Bank had a record of delivering results in the activities envisaged under the project and could also draw from its vast global knowledge, experiences in value chain and Community Driven Development (CDD) projects to customize them for Kenya, mobilize resources, and partner with other donors.

5. **The NARIGP was aligned with the government's strategic priorities and was the first fully devolved agriculture project in Kenya, leveraging the new two-tiered system of national and county government.** It contributed to operationalizing the devolution framework for local decision-making and delivery of decentralized services. NARIGP was aligned with GoK Vision 2030 and supported the Agricultural Sector Development Strategy 2010–2020 (ASDS) priorities of increasing productivity, commercialization, and developing and managing key production factors (e.g., land, water, and rural finance). It was also consistent with the 2010 Comprehensive Africa Agriculture Development Programme (CAADP) Compact on increasing productivity and agricultural investments.

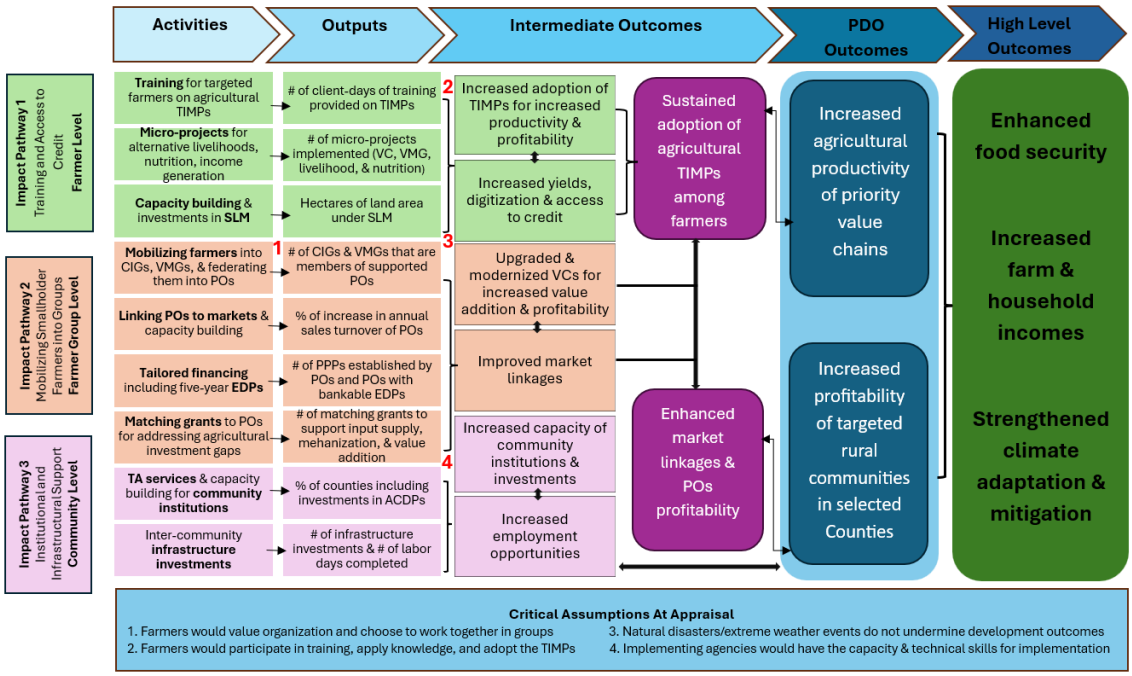
[1] World Bank (2024): https://data.worldbank.org/indicator/NY.GNP.PCAP.CD?locations=KE
[2] Kenya Bureau of Statistics (2013): Exploring Kenya's Inequality: https://inequalities.sidint.net/kenya/wpcontent/uploads/sites/3/2013/10/SID%20Abridged%20Small%20Version%20Final%20Download%20Report.pdf
[3] African Development Bank (2023): https://www.afdb.org/sites/default/files/documents/publications/kenya_country_food_and_agriculture_delivery_compact.pdf

6. **NARIGP was aligned with the Bank's goals of reducing poverty and promoting shared prosperity, the Kenya Country Partnership Strategy (CPS) FY 2014–2018, and built on prior engagements**. The project was coordinated with Bank operations such as the Kenya Climate Smart Agriculture Project (KCSAP), Kenya Youth Employment Project (KYEP), and the Kenya Devolution Support Project (KDSP). NARIGP also combined the Value Chain (VC) approach piloted under the Kenya Agricultural Productivity and Agribusiness Project (KAPAP), and the CDD approach of the Western Kenya Community-Driven Development and Flood Mitigation Project (WKCDD&FMP). It was aligned with the CPS' Domains 1 and 2[4] on fostering public-private partnerships (PPPs) in agribusiness, developing value chains (VCs), innovative rural financial markets, and improving agricultural performance and safety nets for the rural poor and vulnerable and marginalized groups (VMGs)[5] using a community-led approach.

Theory of Change (TOC) - Results Chain

NARIGP's Project Appraisal Document (PAD) did not have a TOC as it was not mandatory at appraisal. The proposed TOC is based on project components, and pathways of impact relied on key assumptions[6] (Figure 1).

Figure 1. Theory of Change Implicit at Approval



7. **NARIGP was organized through three integrated levels of community infrastructure: individual farmers, farmer groups, and counties at the community level**. For sustainability, each component had a capacity building sub-component. NARIGP adopted a CDD approach (Component 1) to enable farmers to adopt climate smart TIMPs[7], and increase their access to public sector infrastructure and services for increased productivity, profitability, and climate resilience. At ward level, all groups were linked to a CDD Committee (CDDC), for participatory planning. The community infrastructure empowered the GoK to deliver services to farmers. Support to Farmer Producer Organizations (FPOs) was also used as a channel for market access (Component 2). CIGs and VMGs were federated into FPOs to facilitate market linkage along the priority VCs and to increase their profitability through grants.

[4] Domain 1: Competitiveness and Sustainability – Growth to Eradicate Poverty and Domain 2: Protection and Potential – Human Resource Development for Shared Prosperity
[5] A key premise of NARIGP was linking VMGs and CIGs (made up of about 15 - 25 individuals) to POs, organized along selected priority value chains. The beneficiaries who were part of the VMGs included the elderly, unemployed youths, widows/orphans, recovering substance abusers, and the differently abled.
[6] Another assumption is that the bottom-up, demand driven approach prioritizing local farmers' needs would result in sustainable and effective agricultural practices tailored to specific local conditions, fostering greater participation, and ultimately improving food security and economic viability within the communities.
[7] TIMPs which were scaled up, validated and developed were assessed and a list of the potential TIMPs for scaling up CSA are provided in Annex 5.

Farmers also benefitted from community level investments such as irrigation schemes, and market infrastructure (Component 3). Nutrition-informed interventions, gender sensitivity and youth inclusivity were mainstreamed in the project design for poverty reduction through income growth.

Project Development Objectives (PDOs)

8. The PDO in the PAD (page 7) aimed 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 immediate and effective response*." Another implicit goal of the project was to support Kenya's devolution process[8].

Key Expected Outcomes and Outcome Indicators

9. The three expected PDO outcomes and their related indicators, as originally approved, were: (1) "Increasing agricultural productivity of targeted rural communities in selected counties" which was to be measured by the indicator "*Yield increase in the selected priority agricultural value chains supported by the project (Percentage*)", and "*direct beneficiaries who have adopted improved agricultural TIMPs promoted by the project (disaggregated by gender)*"; (2) "Increasing agricultural profitability of targeted rural communities in selected counties," which was to be measured by "*Producer organizations supported by the project reporting an increase in profitability (Percentage)*", and (3) "Provide an immediate and effective response in the event of an eligible Crisis or Emergency", which had no outcome indicator at appraisal. The outcome indicator "*direct project beneficiaries (disaggregated by gender)*" contributed to tracking all outcomes. The project had 13 intermediate results indicators (Annex 1).

Components

10. The four NARIGP components, activities, and achieved outputs are provided in Annex 1. Amounts at approval (estimated) and at closing (disbursed) are provided in Annex 3.

- Component 1: Supporting Community-Driven Development (US$80 million, of which US$75 million IDA and US$5 million counterpart funding). This component was designed to strengthen (i) community-led institutions' (CIGs, CDDCs, and VMGs) ability to identify and implement investments[9] that improve agricultural productivity, food security and nutritional status, and (ii) linkages to selected VCs and POs.
- Component 2: Strengthening Producer Organizations and Value Chain Development (US$50 million, of which US$45 million IDA and US$5 million counterpart funding): Enhancing the capacity of POs to support groups in VC development in rural areas through (i) organization and capacity building, with tailored financing for enterprise development, and (ii) mapping competitive nutrition-sensitive VCs and upgrading them with grants[10].
- Component 3: Supporting County Community-Led Development (US$72 million, of which US$65 million IDA and US$7 million counterpart funding): Strengthening county government's capacity to support community led initiatives through TA, service providers' supervision, private sector participation, financing inter-community infrastructure investments, and establishing mechanisms for effective citizen engagement.
- Component 4: Project Coordination and Management (US$17 million, of which US$15 million IDA and US$ 2 million counterpart funding): Project management through, inter alia, the provision of technical assistance (TA), acquisition of equipment and vehicles, and the financing of operating costs. The total project cost at appraisal was US$ 219 million, of which US$ 200 million IDA and US$ 19 million counterpart funding[11].

B. SIGNIFICANT CHANGES DURING IMPLEMENTATION

11. The project underwent four level 2 restructurings (Annex 7, Table 2). The first restructuring of July 2017 changed the project implementing unit from the Ministry of Devolution and Planning (MoDP) to the Ministry of Agriculture, Livestock and Fisheries (MoALF), and revised some legal covenants based on MoALF's institutional

[8] This included supporting national and local governments' (counties) coordination capacity and build counties' capacity to implement agriculture activities

[9] Technical, managerial and fiduciary capacity building, and facilitating County Technical Departments (CTDs) for oversight and quality assurance at the sectoral level. Component 1 also financed micro-projects on sustainable land management, support for marginalized groups, and nutrition through better food consumption, income generation, and women's empowerment.

[10] Grants were meant to address investment gaps in input supply systems, farm mechanization, value addition, and post-harvest management

[11] Counterpart funds: US$2 million from the GoK, US$7 million from county governments' cofinancing, and US$10 from beneficiary contributions. This amount did not change throughout the four restructurings, but the allocation across components changed (Annex 7, Table 1).

capacity, fiduciary risks, and proposed mitigation measures. The second restructuring of October 2021 was a response to delays due to the long national election process, the COVID-19 pandemic, and the locust attack in 2020. It focused on: (i) changes in components' costs; (ii) reallocation of funds across disbursement categories and adjustment of the financing proportions; (iii) provision for both monetary and in-kind contributions from the national and county governments; (iv) an 18-month extension of project closing date from December 31, 2021, to June 30, 2023; and (v) modification to the results framework. The third restructuring of May 2022 reallocated funds from Category 8 (Sub-projects) to correct an underestimation of Category 9[12] funds. The fourth restructuring of April 2023 entailed a 9-month no-cost project extension and the inclusion of the Limuru Dairy Farmers (FPO) as a procurement entity.

Revised PDOs and Outcome Targets

12. No changes

Revised PDO Indicators

13. No changes

Revised Components

14. Components' costs changed and funds were reallocated across categories (Annex 7, Table 2)

Other Changes

15. No other changes

Rationale for Changes and Their Implication on the Original Theory of Change

16. The first restructuring addressed MoDP's weak implementation capacity. The Bank and the MoALF[13] requested the transfer of implementation responsibilities to MoALF, a unit with strong technical capacity and which developed (with counties) a framework for implementing national agricultural programs. The second restructuring, a response to shocks such as COVID-19, prioritized micro-projects at the CIG level so farmers could receive inputs, support and extension services. NARIGP was further restructured to extend the closing date to March 31, 2024, to complete and close large investments (e.g., the Limuru Dairy FPO milk sterilization unit) which had been delayed due to funds flow challenges[14].

II. OUTCOME

A. RELEVANCE OF PDO

Assessment of Relevance of PDOs and Rating

17. **The NARIGP's relevance is rated as High.** The PDO was clear and remained aligned with national policies, priorities, strategies, plans and World Bank CPS FY14-18, and is consistent with the CPF FY23-28. The project was aligned with the CPF's objective 3 on fostering MSME & small producer success for faster job creation and objective 6 on increasing household resilience to, and national preparedness for, shocks. In March 2022, the World Bank approved a new program, the National Agricultural Value Chain Development Project (NAVCDP) which is building upon NARIGP, further confirming the relevance of the PDO.

B. ACHIEVEMENT OF PDOs (EFFICACY)

18. **PDO Indicators Assessment:** The indicators had some limitations. For instance, the number of project beneficiaries does not capture the achievement of productivity and profitability outcomes. The TIMPs adoption indicator seems more appropriate as an intermediate or output level indicator (Figure 1), instead of outcome level. The binary profitability and productivity indicators masked heterogeneity across VCs as there was a wide range of yield increases. On profitability, there is an increased risk for bias as "*POs reporting an increase in profitability*" is a

[12] Goods, Consulting & Non-Consulting Services; Goods, Works, and Operating Costs under Component 1.1, 2.2, 3 and 4
[13] MoALF is now known as the Ministry of Agriculture and Livestock Development (MoALD)
[14] The project could not disburse $25.4 million to counties due to delays in approving the County Additional Grants Framework. Additionally, $17.5 million already disbursed was still held in county accounts as new executives established governance structure

reported number. Assessing actual increases in profits over time could have further validated the data. However, the indicator measuring the percentage increase in annual sales turnover of POs serves as supportive evidence.

19. **The Efficacy rating of the PDO is Substantial, having overachieved its PDO outcomes, PDO indicators, and all but one of its intermediate indicators (Annex 1)**. The degree to which the PDO is achieved is based on assessment of the main objectives: (i) "Increasing agricultural productivity of targeted rural communities in selected counties"; (ii) "Increasing agricultural profitability of targeted rural communities in selected counties"; and (iii) "In the event of an Eligible Crisis or Emergency, to provide immediate and effective response." Data sources and methodologies for assessing outcomes are provided in Annex 8. The data is drawn from NARIGP's Monitoring and Evaluation (M&E) system[15]. The project MIS utilized multiple rounds of data reporting on productivity levels for a sample of 15,687 project farmers. This data is reflected in the Bank's 14 ISRs for NARIGP, project Aide Memoires, progress reports, mission findings of the ICR team, and the Borrower's Completion Report which all inform this ICR's assessments of both the efficacy and the efficiency of NARIGP.

Assessment of Achievement of Each Objective/Outcome

20. **The first PDO objective to "Increase agricultural productivity of targeted rural communities in selected counties" was overachieved.** This objective was measured by PDO indicators 2 and 3: "Direct beneficiaries adopted improved agricultural TIMPs promoted by the project" and "Yield increase in the selected priority agricultural value chains supported by the project", with targets for both indicators exceeded: (i) the direct beneficiaries who adopted improved agricultural TIMPs promoted by the project had a target of 176,400 while the actual final value was 342,966 (59 percent female), equal to 194 percent of the target; (ii) the target yield increase in the selected priority agricultural value chains supported by the project was 30 percent while the actual final achievement was 44.1 percent, equivalent to 147 percent of the target.

21. **The project delivered extension services through inclusive CIGs and VMGs, which reached women and smallholder farmers.** The project midline survey and MIS data indicated increasing rates of TIMPs adoption among subsistence level farmers, accessing extension services from NARIGP. As per the midline survey comparing project vs non project households, project participant households had 0.2 acres lesser land, 10800 Ksh lesser average credit amount, and 4 percent more female headed households. 59 percent of project households indicated NARIGP as the primary source of extension in midline survey, conducted in 2021. Among prioritized VCs, chicken and dairy were the most prominent with more than 80 percent of project counties opting for these, and nearly 75 percent of farmers trained, belonging to these VCs. Banana, Irish potato, and green grams accounted for more than 4 percent each of project households. Out of 358,260 beneficiaries trained by the project across various VCs on TIMPs, 93 percent reported to have adopted at least one TIMP. For crop and fruit production, the TIMPs included the use of improved (certified) CSA seeds, improved agronomic and crop husbandry practices (e.g., line seeding, manure, additional chemical fertilizer, and hermitic bags). Timely delivery of extension services through lead farmers/community-based facilitators trained by Kenya Agriculture and Livestock Research Organization (KALRO) on TIMPs, improved seeds, and market data, was crucial in farmer capacity building. The project trained 470 master trainers, 2,377 community-based facilitators and 8,056 lead farmers to deliver TIMPs training. The wide coverage across project wards enabled peer to peer learning and adoption of TIMPs. Many lead farmers were female, and 68 percent of the training days provided on TIMPs were to them. This translated into more females adopting TIMPs at 59 percent, compared to the 50 percent target (Annex 1). Additionally, KALRO provided support in field testing and validation of TIMPs to ensure extension content was backed by research. 18,890 group and community level micro-projects were implemented, crucially covering over 99 percent of all CIGs and VMGs under the project, demonstrating benefits of TIMPs adoption. Depending on the VCs, the micro-projects focused on demonstrating

[15] The M&E system utilized a phased and systematic data collection approach: **large-scale baseline data collection** through a census approach, followed by a **midline survey** in 2021 to compare key variables across project and non-project beneficiary households, and the **farm level survey** in 2024, to measure productivity, economic, and financial performance

TIMPs adoption over a production season, enabled supply of improved inputs for trial by farmer members, and supported acquisition of community level tools and assets supporting improved practices.

22. **Overall yield percent change based on baseline and endline data for 11 value chains ranged from 5.6 percent for Irish potato to 204 percent for leafy vegetables.** The project surpassed the overall target of 30 percent increase for chicken, dairy, banana, apiculture, tomato, and local vegetables, while productivity increase was below the 30 percent target for Irish potato, green grams, avocado, and mangoes. The 2020-2022 drought is expected to have played a key role in lesser than target increase for green grams and Irish potato, the predominant VCs in arid and semi-arid counties, most affected by poor rainfall. While the overall average increase in productivity is 44.1 percent, the weighted productivity increase, based on farmers' distribution across value chains, comes to 41.6 percent. The findings were confirmed by the endline survey conducted at the end of the project. Data from the 2024 impact assessment of the project, which was based on the findings of a survey of beneficiaries and non-beneficiaries indicate significant yield increases with project beneficiaries (Annex 7, Table 4). The findings of the 2024 survey were consistent with previous survey rounds conducted in 2019 and 2021 that indicated upward trends in TIMPs adoption and yields in project areas. The significantly higher crop and livestock productivity resulted in surplus production, higher consumption at household level, higher sales and household incomes. This transition is highlighted by more farmers moving from subsistence to early commercialization, and commercial levels of production. As per the 2024 survey, the number of project-supported farmers at subsistence level dropped from 74.6 percent at baseline to 47.7 percent. However, the percentage of commercial level farmers increased from 9.8 percent to only 18.3 percent, indicating that a large segment of farmers is still in transition from subsistence to commercial production levels. The yield increase occurred against a backdrop of a severe drought and the COVID-19 pandemic which impacted delivery of agriculture support services.

23. In addition, 12 of the 13 intermediate results indicators associated with the PDO indicators were greatly exceeded (Annex 1, Table B). The increased agricultural productivity of targeted rural communities under NARIGP was directly attributable to the project's interventions on promoting TIMPs and capacity building of farmers and institutions. NARIGP success stories are shown in Annex 6.

24. **The second PDO objective of "Increased profitability of targeted rural communities in selected counties" was overachieved.** This outcome was measured by PDO Indicator 4: "Producer Organizations supported by the project reporting increase in profitability (Percentage)." The target for the indicator was exceeded as 84 percent of POs supported by the project reported increase in profitability against a target of 70 percent. Crucial to the second objective was the development of high capacity FPOs through structured, long-term support. At the time of project entry, POs were graded on multiple parameters including operational scale and quality, techno-managerial capacity, financial health, farmers coverage, and market partners. Of the 335 registered POs, 305 received tailored capacity building support and 248 POs received inclusion grants, enabling them to expand their member base by 37.9 percent, driven primarily by CIG and VMG members. A total of 314 POs developed enterprise development plans (EDPs) for long-term viable businesses delivering value to members, seeking capital investments for asset building and working capital. Ninety-eight EDPs were disbursed, enabling POs to invest in equipment, and technologies. The expanding member base and operational scale is reflected in the growing annual revenue of POs, which has grown by 30 percent, compared to baseline and profitability with 226 of the 305 POs reporting increased profitability (Annex 7, Table 5).

25. These investments enabled POs to become attractive institutions for private sector partners, with 135 POs entering into Public Private Partnerships (PPP), 168 POs delivering extension services, and 77 POs leveraging performance-based VC Upgradation Matching Grants (VCUMGs). Of the 231 graded POs, 125 were at B or above at project closure, up from 35 at baseline, indicating the significant improvement in operational quality of POs. At member level, this translated into NARIGP farmers' transition to commercialization. The number of farmers at commercial production levels transitioned from 9.8 percent at baseline to 18.3 percent at endline, an 8.5 percent improvement. Among value chains with high farmer participation, the change ranged from 1.5% for chicken to

16.8% for avocado (Annex 7, Table 6). It is noteworthy that number of projects supported farmers at subsistence level dropped from 74.6 percent at baseline to 47.7 percent, much higher than those entering the commercial level. This is a strong indicator of most farmers being in early commercial to transitional stages, highlighting the need for sustained support.

26. Under component 1 and 2, CIGs and VMGs were linked to new and existing FPOs for sustained access to markets, inputs and extension services. POs were supported through sequential interventions and investments aimed at building their capacity to function as community oriented, market facing institutions. The key outputs achieved that directly led to all PDO and intermediate results indicators being exceeded for the second project outcome included the following: Under Component 2; (i) 12,585 CIGs/VMGs that are members of supported POs against a target of 8,400 (ii) 30 percent increase in annual sales turnover of targeted POs against a target of 20 percent, (iii) 196 PPPs established by POs against a target of 21, and (iv) 314 POs with bankable EDPs against a target of 84.

27. **The other intermediate results indicators provide additional evidence on the different pathways of impact on beneficiaries, productivity, the scale of adoption of TIMPs, profitability, and sustainability of project interventions**. Under Component 3, these include, (i) 100 percent of participating counties included county level project investments into Annual Development Plans, surpassing the target of 70 percent, (ii) 149 agricultural and rural development infrastructure and natural resource investments, surpassing the target of 90, and (iii) 2,088,789 labor days completed by project beneficiaries against a target of 3,000,000. While all other indicators significantly exceeded the targets, labor days completed by project beneficiaries of employment programs only attained 70 percent of the target. This was due to the use of machinery for some SLM investments (such as the excavation of water ponds) in some counties instead of using manual labor when it was physically challenging to do so.

28. **The third objective that "In the event of an Eligible Crisis or Emergency, to provide immediate and effective response"** was not evaluated as sub-component 4.3 was not triggered.

Justification of Overall Efficacy Rating

29. **The overall Efficacy is rated Substantial**. Despite limitations of the PDO indicators, the project overachieved its targets. Some factors which contributed to the success include: the reassignment of the implementing role to an entity with strong technical capacity, synergies with other World Bank operations, incorporating lessons learned from the project's first phase, innovative solutions to disbursement delays, and recruitment of thematic experts. This resulted in the achievement of the PDO and related intermediate indicators. The participatory CDD approach enabled the project to align with community interest and prioritize technologies which were most promising for specific agro-ecological zones, and which provided the best value for money, leading to high levels of satisfaction amongst beneficiaries. The county ranking competitions were also essential for the success of the program. The project also exceeded its targets on gender.

30. Achievement of the PDO was also supported through Farmer field schools (FFS), an integral part of NARIGP which enabled farmers to expand their knowledge, develop their businesses, increase household incomes. The FFS success story was featured by the FAO Investment Centre and a video shows the impact of FFSs on productivity and profitability (Annex 6, Box 1). Farmers in Kitui county, an ASAL area reported over a 20-fold increase in chicken production and a 12.5-fold sales increase for honey. The FFSs enabled farmers to access TIMPs (e.g., feeding and watering techniques and modern hives). Other case studies include that of doubled milk production and a five-fold increase in banana production due a NARIGP irrigation scheme in Kiambu county (Annex 6, Boxes 3 and 4). Other NARIGP case studies on VCs, institutions strengthening, empowerment of VMGs, extension, institutionalized POs, SACCOs, and digital investments were compiled[16] to show NARIGP's impact on productivity and farmer incomes.

[16] NARIGP. 2023. From farm to market: Increasing agricultural productivity and profitability of rural communities in Kenya. NARIGP Case Studies. Nairobi Some of the case studies on a potato FPO, beekeepers refinery and a farmers SACCO are included in Annex 6 (Boxes 6, 7 and 8). There are additional NARIGP success stories on community transformation in 8 of the 21 implementing counties as well.

C. EFFICIENCY

Assessment of Efficiency and Rating

31. **The Efficiency is rated Substantial. The efficiency analysis was based on an ex-post economic and financial analysis (EFA), and an analysis of efficiency of the use of financial resources.** The Efficiency Analysis assesses aspects of project design and implementation efficiency, while the EFA focused on investments in priority VCs, financed with project support. Overall, on efficiency, the NARIGP implementation structures were mostly effective in achieving their purposes**.** Project implementation strategies were complied with but setting up county-level implementation and capacity building took longer than initially expected due to the 2017 national elections and the COVID-19 pandemic. However, once the implementation structure was operational, the large-scale CIG, VMG, and FPO mobilization, proposal preparation, and implementation of sub-projects and micro-projects was exceptional. The response of the grassroots level to the opportunity of matching grants was very strong, in terms of mobilization and ownership. The financial analysis looks at the impact of the TIMPs on smallholder farming in the priority VCs, of which 5 were under crop production, 4 for perennial crops, and 4 livestock models. Based on the standard financial performance indicators presented, namely internal rate of return (IRR), net present value (NPV), benefit-cost ratio (BCR), margin analysis, return to labor, the analysis confirms the financial viability of the proposed TIMP investments by the project. The TIMPs increased productivity and yield on average by 40 percent, which made them sound investments (Annex 4).

32. **The economic analysis of NARIGP is** based on i) the benefit flow from investments by 342,966 households who benefited from micro-projects and adopted TIMPs in the priority VCs; ii) incremental benefits, resulting from investments in FPOs and cooperatives; and iii) monetized environmental benefits expected to accrue from reduced GHG emissions and increased carbon sequestration, calculated using Ex-ACT. Overall, the economic results of the project are positive, generating an economic net present value (ENPV), at 6 percent social discount rate of US$ 436.5 million and an economic rate of return (ERR) of 22.8. percent (over a 20-year period), not accounting for environmental externalities (GHG accounting). The sensitivity analysis, which considers key risks such as lower benefits and technology adoption rates, and the social discount rate, shows that the economic profitability is very robust. The 22.8 percent ex-post ERR is slightly higher than the ex-ante ERR of 21.8 percent, due to the higher outreach of the Project than planned. The lower ex-post ENPV of US$ 431.7 compared to the ex-ante ENPV of US$ 827 million because of the slow implementation rate and the use of an ex-ante social discount rate of 5 percent. Including the carbon mitigation valued at the low carbon price estimate range, the project is expected to generate an ENPV of US$ 483.9 million and an ERR of 24.8 percent. When using the high market price estimate range for carbon, the project could generate an ENPV of US$ 535.8 million and an ERR of 26.9 percent (Annex 4).

D. JUSTIFICATION OF OVERALL OUTCOME RATING

33. **The relevance of the project is rated as "High", and Efficacy and Efficiency are rated as "Substantial." The project remained aligned with relevant national policies, strategies, plans, and World Bank strategies.** The PDO indicators were overachieved, due to the participatory CDD approach which ensured community interest, various innovative approaches and adaptations developed by the team, and targeted delivery of results. The financial analysis also confirmed the financial viability of the TIMPs by the project. These investments clearly improved food security and resilience of households. Based on the economic analysis, the project is profitable under all scenarios, with and without the valuation of environmental benefits. Implementation strategies were largely adhered to, but the significant delays due to the 2017 national elections, COVI9-19 pandemic, and funds flow resulted in the first and second project restructuring. However, the magnitude of CIG, VMG and FPO mobilization, proposal preparation and speed of disbursements once the implementation mechanism was operational, shows the efficiency of the approach at county and community level. Because of these ratings and considering the successful management of project challenges by the team, the **overall outcome rating is Satisfactory.**

E. OTHER OUTCOMES AND IMPACTS

Gender

34. **NARIGP deliberately targeted female beneficiaries, tracked how they benefited from the project, and the results exceeded targets as 59 percent of beneficiaries were female against a 50 percent target**. Gender and social inclusion were a key focus of NARIGP. Interventions focused on reducing drudgery and the time burden on females (PAD, Annex 7). A study was conducted to inform the mainstreaming of social and economic inclusion focusing on VMGs. Throughout implementation, gender mainstreaming and social inclusion remained on track. Results indicators were disaggregated by gender to monitor women's participation in the project interventions. Implementing agencies were accountable for gender and social perspectives in project activities. The distribution of the sample by gender of CIGs/VMGs member shows that 62 percent and 68 percent of the treatment and control households, respectively, had more female CIG/VMG members. Based on the field visits[17] by the ICR and PCR teams, it was evident that women and youth were actively involved in the project management and implementation at various levels. In many communities, women were secretaries and treasurers, with some being chairpersons. Regarding VCs, women were identified with banana, poultry, local vegetables and dairy value chains, enterprises that did not demand large financial and land resources. Youths were involved in SLM activities that offered employment opportunities, and dairy feed production.

Institutional Strengthening

35. **The project strengthened the institutional capacity of both national and county government staff so they could support beneficiaries in addressing food security, poverty and hunger, and climate change vulnerability**. NARIGP provided fundamental institutional strengthening for counties. As a result, some counties are currently pursuing the CDDC model as a vehicle for inclusive community development. The skills gained by CDDCs in proposal development enabled them to support POs/PPPs to acquire additional finances to expand projects activities. The project also made significant investments towards capacity building of community institutions which included CIGs, VMGs, IWUA/WUA, and FPOs. The project made a deliberate effort to build the capacity of VMGs through grants and training on TIMPs. This immensely contributed towards human and social capital and empowerment in the project areas. This improved the knowledge and skills of the communities through capacity building programs where several TIMPs were adopted by farmers.

Poverty Reduction and Shared Prosperity

36. **The project had an impact on both poverty reduction and shared prosperity with its focus on increased productivity and profitability**. Farmers' yields increased by over 44 percent based on the endline report, due the TIMPs promoted by the project. The transition of 18 percent of smallholder farmers under NARIGP from subsistence to commercial is a demonstration that farmers' incomes increased. FPOs increased their profitability by 30 percent. Additionally, the CDD approach and institutional strengthening at county and community-level ensured that that the most vulnerable communities were included. A total of 12,585 CIGs and VMGs were members of supported POs, thereby empowering the groups with access to finance, training, markets, and better prices. The support and development of SACCOs also increased access to finance. According to the borrower's PCR, project activities also improved the beneficiaries' incomes and enabled them to meet various social needs such as paying for hospital expenses and school fees and purchasing clothes. Some beneficiaries reported improved health for their family members, especially children due to the interventions promoted under livelihoods and nutrition grants.

Strengthening jobs creation across value chains

37. **The project played a key role in creating jobs through direct and indirect pathways**. Through the 149 agricultural infrastructure and natural resource investments at county level, over 2.08 million labor days of employment were generated, enabling local governments to develop productive common infrastructure and assets while generating employment. The project also contributed to job creation indirectly through investments across priority value chains. 248 FPOs receiving inclusion grants under the project expanded their membership base and

[17] The ICR mission team conducted field visits in Kisii and Kiambu counties to assess the impact of SACCOs, CDDCs, CIGs, FPOs, and community SLM investments on beneficiaries. Three cases studies from the field visits are provided in Annex 6.

employed additional human resources at multiple levels to support operations around aggregation, transportation of produce, quality control, and operation of newly acquired equipment. Additionally, project investments were instrumental in generating new jobs and employment opportunities in delivery of digital agriculture services, and agri-business enterprises benefitting from newly commissioned market infrastructure. Learning from the experience, NAVCDP is putting in place improved tracking mechanisms to accurately measure the number and quality of jobs being created through project investments.

Other Unintended Outcomes and Impacts

38. **An unintended positive outcome was the increased reach to beneficiaries through lead farmers/Community Based Facilitators (CBFs)**. KALRO's training of lead farmers significantly contributed to NARIGP's success. Another outcome was the digital transformation[18] of the agriculture sector (Annex 6, Box 2). The NARIGP leveraged the foundational digital infrastructure supported through the One Million Farmers Platform (OMFP) to identify and enable ag-techs to support beneficiaries on productivity, market linkages, financial inclusion and analytics. An unintended negative outcome of the project with some SLM investments was some conflict between livestock and crop producers over security features around water facilities such as water ponds.

III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

A. KEY FACTORS DURING PREPARATION

39. **NARIGP's design was informed by existing national knowledge and lessons learned from previous projects.** It incorporated insights from past World Bank supported CDD projects and institutional platforms that have benefited VMGs in Kenya. For example, WKCDD&FMP showed that Participatory Integrated Community Development (PICD) was a powerful tool and emphasized the importance of grievance redress mechanism for solving conflicts. Similarly, the IEG evaluation[19] of KAPAP identified variability in the quality of sub-projects and stressed the need for standardized VCs training modules. NARIGP also incorporated lessons from global[20] and regional projects such as the importance of investing in POs, strengthening business plans, and facilitating market linkages for enhanced productivity and access to better prices. Even though implementation was initially done by the MoDP, NARIGP's concept note preparation started under MoALF. The project focused on agricultural productivity and VC development and MoALF had the technical competence required for implementation, and the mandate for the agricultural sector - including policy development, technical capacity building of the counties, regulatory functions, and research and development.

B. KEY FACTORS DURING IMPLEMENTATION

40. **Overall, project implementation was Satisfactory, meeting most of the outcome/output targets**. NARIGP experienced significant delays during its initial implementation phase due to internal and external factors. However, the World Bank team, along with the national and county governments took several corrective and proactive measures to accelerate progress. Initial delays were due to the MoDP's weak implementing capacity, fund flow delays, the prolonged 2017 national election process, and the twin crises of COVID-19 pandemic and the locust attack in 2020. As such, the project initially struggled to gain momentum, with limited implementation progress in FY18/19. Therefore, the team focused on addressing the major constraints.

1. **From July 2018, the GoK, with the support of the World Bank initiated several measures before the mid-term review (MTR)[21] to fast-track project implementation.** The implemented measures did not change the project's core structure but contributed to the project's success through innovative solutions which also increased the number of beneficiaries.

[18] NARIGP's achievement in Disruptive Agricultural Technologies is provided in Annex 6, Box 2. Over 450,000 farmers were reached with DAT solutions, agripreneur models were introduced with, SACCOs were automated, and FPOs were digitized.
[19] The evaluation emphasized the importance of lead farmers in providing extension services and enhancing peer to peer learning, and the role of digital technologies in reaching beneficiaries
[20] Drawing from the experiences of Brazil and Mexico, the project also ensured clear delineation of roles between national and county governments to reduce conflicts and improve efficiency.
[21] MTR and ISM was from July 15 -26, 2019. The measures which were implemented before the MTR to fast-track project implementation rapidly changed the rate of disbursement before the second restructuring in 2021.

2. **To enable timely availability of funds, an operational account at the county level was created.** This innovation in the project has implications for the broader WB portfolio in Kenya. The World Bank team engaged county governors to secure their support for establishing an additional operational account in each county. This account was linked to the SPA but allowed expenditures throughout the fiscal year, expediting disbursements. The World Bank team also developed a fund flow framework, now adopted in other World Bank projects across various sectors beyond agriculture. This approach could be equally beneficial in other countries with devolved governance structures.

41. **To overcome procurement delays**, a short-term procurement consultant was recruited to train and support the National Project Coordination Unit (NPCU) and CPCU on operations, capacity building, and Systematic Tracking of Exchange in Procurement (STEP)-related issues.

3. **Panels of Experts (PoEs) were established for ESS, micro-projects evaluation and FPOs**. At the national level, PoEs were drawn from the relevant sector departments and private sector. The engagement of PoEs substantially improved the quality of the proposals and reduced periods of regulatory approvals. The World Bank also provided consultants to support the strengthening of community institutions, formation of SACCOs, strengthening of POs and establishment of markets, and extension services. Additionally, lead farmers were trained on TIMPs, seeds, and market data for effectiveness and sustainability of extension services.

4. **Incentives to reward good performance also helped to fast-track implementation**. NARIGP provided fundamental institutional strengthening for counties because the devolution process brought new opportunities and challenges. More resources were allocated to counties that demonstrated higher capacity and higher fund utilization. Performance indicators were also introduced, and counties were ranked based on the indicators and certificates and medals were awarded to best performing counties.

5. **Digital solutions were also crucial for monitoring, evaluation, and implementation support during the COVID-19 pandemic and locust twin crises**. The task team conducted virtual meetings, remote field visits, and community meetings through drone surveillance. These measures fast-tracked project implementation such that by July 2019, total disbursements had risen to 16 percent and rising further to 48 percent by September 2020.

IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

A. QUALITY OF MONITORING AND EVALUATION (M&E)

M&E Design

6. **An M&E and MIS were established at both national and county levels to support results-based project monitoring and to facilitate evidence-based decision-making.** These systems were designed to offer real-time feedback to key stakeholders regarding progress toward the project's main objectives. The Project Implementation Manual (PIM) and M&E manual guided the monitoring of activities and achievement of targets. This approach utilized several tools, including the NARIGP results framework, the annual work plan and budget (AWPB), and the M&E plan. Additional tools included the financial and procurement plans, data collection instruments, reporting tools, the web-based PMIS, and technical guidelines for project implementation. The M&E manual clearly defined institutional roles and responsibilities for monitoring and evaluation across national, county, and community levels. The manual identified process indicators to track progress and explained the conduct of evaluation in NARIGP, including baseline survey, mid-term review, project completion evaluation as well as more targeted evaluation studies. Community-based organizations were included for participatory monitoring of project implementation, service provider performance, and grievance reporting. The manual emphasized the preparation of AWPBs and quarterly reports at both national and county levels, using established reporting templates. The project PMIS played a critical role in data management. The M&E manual also focused on integrating learning into the project by promoting self-assessment, review processes, documentation of lessons learned, and stakeholder engagement. It

identified capacity-building needs for CPCUs, service providers, and community stakeholders, particularly in areas like M&E procedures, grievance reporting, and compliance with the project's monitoring framework.

M&E Implementation

7. **The M&E framework was implemented adequately**. A set of process and output level indicators were tracked monthly through a multi-tiered M&E system, via a combination of community level forms and excel sheets, consolidated into a PMIS and digital dashboard. With the three-tiered implementation arrangement, the institutional arrangements for M&E involved (i) at the national level, NPCU M&E Officer and project component leaders responsible for preparing quarterly reports using the designated format; (ii) at the county level, the CPCU M&E Officer, supported by contracted service providers and CTDs, oversaw data collection; and (iii) at the community level, monitoring project implementation, assessing service provider satisfaction, reporting grievances, and disclosing project details was assigned to CIGs/VMGs, CDDCs, and CVCDCs. NARIGP's larger geographical spread and the subsequent implementation of the NAVCDP since 2023 limited the endline survey's ability to have a clean control group. As a result, the outcome measurement driven by the baseline and endline panel survey while recording significant improvements over baseline numbers, remains weak in establishing causality.

M&E Utilization

8. **The results of the NARIGP project are thoroughly documented, with consistent monitoring through the MIS and a series of analytical reports that utilize both qualitative and quantitative methods to evaluate the project's performance.** The M&E framework incorporated mechanisms to ensure a continuous flow of information between: (i) local communities, institutions, and resource users, (ii) service providers, and (iii) government agencies such as KALRO in relation to agriculture research and extension. In addition, baseline and endline surveys were conducted to analyze the impact of the project using both qualitative and quantitative analysis. These reports used data from the MIS, and primary data from over 3800 project participant households. Building on the baseline survey sample enabled the project to track household level results over the project period. The project also introduced a performance incentive mechanism in form of county rankings, with a scoring and reward mechanism enabling to compare the performance of counties and CIGs/VMGs. This ranking system was driven by regular tracking of the results indicators at county and community level. Furthermore, the project innovatively utilized virtual methods including video conferencing with community institutions, and drone-based surveillance during the COVID-19 period to remotely monitor implementation progress.

Justification of Overall Rating of Quality of M&E

9. **While the M&E suffered from a few moderate shortcomings, its design, implementation and use of high-quality regular data collection enabled good tracking of the project, despite a complex three-tier implementation framework, and enabled pro-active data use as a mechanism to incentivize and assess performance across counties**. Additionally, the Bank's AM for the 8th ISM of May 2023 reported that the Management Information System (MIS) made remarkable progress particularly on the collection and analysis of impact level data and that the project had successfully mapped all 529,000 beneficiaries within the digital database and had integrated routine monitoring data on productivity and TIMPs adoption into the dashboard. As a result, there was improved availability of information around commercialization, the percentage increase in yield, and TIMPs adoption rate. The M&E team also anchored support for end-line surveys and the ICR. Therefore, having invested in strengthening the M&E under NARIGP, the Bank team was satisfied with the data collection of the project's key performance indicators. Therefore, the quality of M&E is rated **Substantial**.

B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE

Environmental and social (E&S)

10. **E&S safeguards compliance was consistently rated Moderately Satisfactory**. The NARIGP was classified as environmental category B. Based on the initial screening of the potential project, investments in rural infrastructure and agriculture VCs, the project triggered the following World Bank safeguards policies: (OP/BP 4.01) Environment

Assessment, (OP/BP 4.04) Natural Habitats, (OP 4.09) Pesticide Management, (OP/BP 4.10) Indigenous People and (OP/BP 4.12) Involuntary Resettlement. As the intervention's design and locations were not known ex-ante, a framework-approach was adopted to manage E&S safeguards to ensure compliance of NARIGP investments to World Bank and national regulatory laws and safeguards policies. To ensure that access to land adhered to legal processes, the project developed land access guidelines in collaboration with the National Land Commission. The GoK developed and disclosed the framework documents[22] through public consultations. The frameworks were used to assess and identify potential adverse environmental and social impacts and provided guidance on screening methods and processes of designing and assessing mitigation measures for specific investments. Investment screening was conducted by following a checklist provided in the PIM and the ESMF document. E&S assessments were done on investments which resulted in various instruments[23]. Grievances were routinely received and effectively addressed through the established GRM structures which includes a web-based real-time system, and a manual system established at the CDDC level for each of the communities covered under the project. There were 2302 recorded grievances, and all were resolved.

Fiduciary

11. **Overall financial management performance was rated Moderately Satisfactory despite some challenges and delays**. The government demonstrated solid compliance with financial management, financial reporting and audit. The project was issued with unqualified audit reports indicating that the fiduciary management systems were satisfactory in ensuring project resources were used as intended. However, there were challenges with disbursements that resulted in delays in disbursing funds to counties. Further delays were also experienced in disbursing from county revenue funds to project operational accounts. The World Bank provided financial management support through enhancing the capacity of the project accountants on reporting requirements and financial management systems. Therefore, despite the challenges and delays, the project had disbursed 100 percent of the funds by September 2024.

12. **Overall procurement performance is rated Moderately Satisfactory.** The initial procurement capacity at the national and county level was inadequate due to limited staff capacity, which led to a Moderately Unsatisfactory (MU) rating of procurement management in the third ISR. However, by the 8th ISR, procurement rating was upgraded to Moderately Satisfactory (MS) following the engagement of TAs in addition to continuous trainings on Bank financed operations, STEP and the GoK procurement guidelines. The most common procurement issues reported in AMs and ISRs were significant delays in completion of key procurement activities, inadequate monitoring and tracking of performance of suppliers, contractors and consultants, and uploading of records. Despite these challenges, in the last ISR, procurement was rated Moderately Satisfactory.

C. BANK PERFORMANCE

Quality at Entry

13. **Overall, the World Bank's supervision was Satisfactory.** The project was aligned with the GoK's strategy and Bank priorities. It had a robust design which was well informed by lessons learned from the Kenya's rich experience in promoting CDD approaches through programs such as WKCDD&FMP and KAPAP. The use of digital technologies was built on best practices with a focus on strengthening capacity and empowering CIGs and VMGs. The participatory prioritization, development, scaling up, and dissemination of promising TIMPs also catered for unique county needs and agro-ecological zones. Overall, the technical, E&S and Fiduciary Systems assessments were comprehensive and recommended mitigation measures were relevant. The program design also included critical actions to increase the capacity of each level of intervention to enable implementation at scale. However, the original implementing role had to be reassigned to an agency with strong technical capacity. Had implementation started with the subsequent agency, that might have reduced the initial delays the project faced.

[22] (i) Environmental and Social Management Framework (ESMF); (ii)Integrated Pest Management Framework (IPMF); (iii) Resettlement Policy Framework (RPF); and (iv) VGM Framework.
[23] (i) An Environmental and Social Impact Assessment (ESIA) for all relatively large investments; (ii) Summary project report (SPR) for medium impact projects, and (iii) Simple environmental and social mitigation measures (a simplified ESMP) for micro-projects or small investments, and Comprehensive project report (CPR) for the high-risk sub projects

14. **NARIGP was designed concurrently with KCSAP and was set up to benefit from KCSAP's ecosystem building and foundational activities such as the OMFP and the farmer registry**. KCSAP also supported KALRO for the development and testing of TIMPS, which were then transferred to NARIGP's beneficiaries. This complementarity in the design of NARIGP and KCSAP was very beneficial and allowed an efficient use of resources. While NARIGP had envisioned the risks related to county government's capacity, and had considered some mitigation measures, more could have been done to mobilize county governments at the beginning of the project. This was addressed during implementation through the World Bank team's creation of the incentive mechanism. Similarly, while credit access was recognized as a key factor in transforming farmers from subsistence to commercial farming, the initial design did not include pathways to achieve this objective. It became clear that the sustainability of CIGs/VMGs, FPOs, and CDDCs depended on their degree of access to credit, once they are no longer benefiting from matching grants. Recognizing this challenge, the project team introduced the function of Savings and Credit Cooperatives (SACCOs) within the CDDCs. This pilot initiative has since been taken up by the ongoing NAVCDP project.

Quality of Supervision

15. The World Bank task team (i) organized 12 supervision missions, which included field visits; (ii) had continuity in leadership as one of the task team leaders (TTLs) supported the project from preparation to closing; (iii) had in-country presence as the TTLs and multi-disciplinary task team were based in Kenya, and able to provide close, continuous support to the NPCU and counties; (iv) conducted continuous reporting through various mission aide-memoires and implementation status reports; and (v) successfully utilized trust funds to provide additional TA to the NPCU and CPCU. The Bank team provided continuous and effective monitoring and was flexible in its responses to unforeseen changes or difficulties. This was particularly important because the project operated in a dynamic political and economic environment and was exposed to the twin crises of the locust attack and COVID-19 pandemic. In response to the evolving internal and external circumstances, the team proactively restructured the project four times and extended the closing date to ensure the completion of project activities. The team also managed to turn the project around following the fourth ISM and upgrading it from a problem project status.

16. **The satisfactory NARIGP supervision can be attributed to several strategic initiatives and innovations.** Multiple TA pathways ensured that support was accessible and responsive to unique county needs. TA was provided by the World Bank short term consultants (STCs), and by a PoE who assisted County Project Coordinators (CPCs). This flexibility empowered local stakeholders and encouraged greater participation. Competition played a vital role in galvanizing county implementation, and M&E strategies were leveraged to incentivize counties to prioritize their agricultural initiatives and create a sense of accountability. Engagement efforts were extended beyond the NPCU to include the CPCs, CECs, and governors. The project utilized the Council of Governors (COG) committee on agriculture to organize retreats that fostered collaboration and accountability among county leaders. The project also engaged the CEC to ensure that agricultural priorities were aligned across the board. The task team was also proactive in reaching out to new county administrations to ensure their support. This positioned NARIGP as a top priority within counties. The establishment of operational accounts in each county was innovative and required the Bank's advocacy. It facilitated the flow of funds and ensured that expenditures occurred throughout the year. This mechanism enabled consistent financial support for county initiatives, enhancing the overall sustainability of the project. During the COVID-19 pandemic, the task team utilized virtual meetings and conducted remote field visits and community meetings through drone surveillance which was facilitated by a local agency. There was a dedicated World Bank session[24] on scaling up data-driven digital agriculture for agricultural transformation in Kenya with a focus on learnings from the NARIGP and KSCAP projects, including lessons on NARIGP's successful remote supervision which enabled the team to reach 120,000 farmers using digital solutions. Digital innovations

[24] World Bank OLC (2022): https://wbg.edcast.com/journey/ECL-a4517791-1a04-4de0-b6bc-e7af3971a025

strengthened county project ownership and helped to prioritize NARIGP as a forward-thinking initiative. It encouraged counties to explore new ways to address agricultural challenges.

Justification of Overall Rating of Bank Performance

17. **The overall rating of Satisfactory Bank performance is justified by the task team's engagement and innovative measures which helped to fast-track project implementation and exceed performance expectations even though the project faced some initial delays.** The task team provided timely, appropriate, and innovative technical support, and succeeded in mobilizing client buy-in at the community, county, and national levels, with some approaches now anchored in government strategy.

D. RISK TO DEVELOPMENT OUTCOME

18. **The risks to development outcomes are Modest and the project put in place solid structures, processes and built capacity to sustain results.** The implementation of the follow up World Bank financed projects (NAVCDP, and Food System Resilience Project Kenya) also represent an important mitigation strategy for future risks to development outcomes. Some of the risks include challenges with establishing market linkages for FPOs beyond the project. Additionally, CIGs and VMGs were incentivized to adopt TIMPs and implement micro-projects with matching grants. Sustaining community institutions without matching grants requires inducing a mindset change of their members to view CIGs as platforms to receive extension services on TIMPs. However, the project had built-in sustainability mechanisms[25].

V. LESSONS AND RECOMMENDATIONS

19. **The lead farmer model of technology transfer and extension encourages community building and strengthening, and peer to peer learning.** The use of lead farmers combined with their training by KALRO was valuable in testing and disseminating TIMPS that were closely adapted to the local agroecological context. This model of technology transfer significantly contributed to the success of the project and helped to reach more beneficiaries. This emphasized the importance of building on available institutional capacity in project implementation. For future projects, the lead farmer model should be aligned with national agricultural extension policies to increase their sustainability and effectiveness.

20. **Delivering TA via multiple channels is crucial.** For innovative projects, it is critical to provide TA through multiple pathways such as Panels of experts (PoE) at the county and national levels to enhance the capacity of implementers and fast-track project implementation and leveraging trust funds to support World Bank STCs.

21. **Market linkages and access to finance is key**. Several CIGs were successfully created under the NARIGP project but there were some gaps regarding market linkages. Some CIGs still need additional training, access to information, and capacity building that will help with market linkages. Therefore, CIGs should be effectively used as platforms for extension and capacity building whilst linking them to FPOs for access to market. There is need to move from one-time funding through matching grants to revolving funds through SACCOs.

22. **Excellent implementation is crucial in a devolved context.** The team navigated various clients at different levels and successfully managed complex political and technical decision-making levels. As Kenya's first fully devolved agriculture project, NARIGP's fundamental institutional strengthening for counties was crucial because the bulk of implementation happened at county level. For example, the high quality of NARIGP FPOs was due to the dedicated staff who nurtured them. The Bank team also introduced a knowledge sharing and competition for development concept where counties were ranked based on implementation performance, efficiency, inclusion, and scale. Best performing counties were awarded with certificates and medals and invited to share lessons and

[25] **SUSTAINABILITY MEASURES** - **Community level**: (i) establishment and strengthening of community institutions (CIGs, VMGs, CDDCs, and FPOs), (ii) federation of CIGs and VMGs into FPOs and linking them to markets and finance via SACCOs linked to CDDCs; (iii) training of lead farmers, who will continue providing services to CIGs/VMGs beyond the project, on TIMPS; and (iv) the adoption of TIMPS which would result in increased productivity and incomes. **National and county level**: (i) clarification of the responsibilities of the national and county government in relation to these institutions and agriculture development in general; and (ii) strengthening the link between research, extension and farmers via lead farmers and community groups.

best practices with fellow counties.

23. **Building strong institutions is crucial for sustainability.** The project developed a strong, multi-layered institutional infrastructure. At the lowest level, CIGs and VMGs served as the foundational group that anchored delivery of extension services and implementation of microprojects, building momentum around demonstration and adoption of productivity enhancing TIMPs. CDDCs served as the representative institutions supporting ward level value chain investment planning and handholding CIGs and VMGs. FPOs were developed across participating counties to ensure that productivity gains from TIMPs adoption, could translate to better returns through aggregation and marketing. Supported by the project, the FPOs significantly expanded their member base, and brought in private sector investment through the matching grant mechanism. To sustain TIMPs adoption beyond the micro-project cycle, the project initiated the process of transitioning CDDCs to SACCOs, laying the foundation for continued access to credit for smallholders.

ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

A. RESULTS FRAMEWORK

PDO Indicators by Outcomes

Not Categorized								
Indicator Name	Baseline		Closing Period (Original)		Closing Period (Current)		Actual Achieved at Completion	
	Result	Month/Year	Result	Month/Year	Result	Month/Year	Result	Month/Year
Direct project beneficiaries (Number)								
Female beneficiaries (Percentage) CRI					50.00			
Direct beneficiaries who have adopted improved agricultural technologies, innovations and management practices (TIMPs) promoted by the project (Number) (Number)								
of which female (Percentage) (Percentage) CRI	0.00				50.00			
Yield increase in the selected priority agricultural value chains supported by the project (Percentage)								
Producer Organizations supported by the project reporting increase in profitability (Percentage)								

Intermediate Indicators by Components

Not Categorized								
Indicator Name	Baseline		Closing Period (Original)		Closing Period (Current)		Actual Achieved at Completion	
	Result	Month/Year	Result	Month/Year	Result	Month/Year	Result	Month/Year
Beneficiaries of social safety net programs (Number of people) CRI								
	Comments on achieving targets		Not Applicable. The new Corporate Scorecard Indicators were not included in the Results Framework at approval.					
Beneficiaries of social safety net programs – Youth (Number of people) CRI								
	Comments on achieving targets		Not Applicable. The new Corporate Scorecard Indicators were not included in the Results Framework at approval.					
Beneficiaries of social safety net programs – Female (Number of people) CRI								
	Comments on achieving targets		Not Applicable. The new Corporate Scorecard Indicators were not included in the Results Framework at approval.					
Client-days of training provided on TIMPs (Number)	0.00	Aug/2016					1,354,945.00	Jun/2024
of which female (Percentage) (Percentage)					50.00		68.00	
Micro-projects implemented, disaggregated by windows (SLM and VC, VMG, Livelihood, and Nutrition) (Number) (Number)								
People with enhanced resilience to climate risks (Number of people) CRI								
	Comments on achieving targets		Not Applicable. The new Corporate Scorecard Indicators were not included in the Results Framework at approval.					
People with enhanced resilience to climate risks – Female (Number of people) CRI							0	Jun/2024
	Comments on achieving targets		Not Applicable. The new Corporate Scorecard Indicators were not included in the Results Framework at approval.					
People with enhanced resilience to climate risks –								
	Comments on achieving targets		Not Applicable. The new Corporate Scorecard Indicators were not included in the Results Framework at approval.					

Youth (Number of people) CRI								
Land area where sustainable land management (SLM) practices were adopted as a result of the project (hectare) (Hectare(Ha))	0.00	Aug/2016			71,400.00	Nov/2021	108,898.00	Jun/2024
CIGs and VMGs that are members of supported POs (Number) (Number)								
People with strengthened food and nutrition security (Number of people) CRI								
	Comments on achieving targets		Not Applicable. The new Corporate Scorecard Indicators were not included in the Results Framework at approval.					
People with strengthened food and nutrition security – Female (Number of people) CRI							0	Jun/2024
	Comments on achieving targets		Not Applicable. The new Corporate Scorecard Indicators were not included in the Results Framework at approval.					
People with strengthened food and nutrition security – Youth (Number of people) CRI								
	Comments on achieving targets		Not Applicable. The new Corporate Scorecard Indicators were not included in the Results Framework at approval.					
Increase in annual sales turnover of targeted POs (Percentage) (Percentage)					20.00	Nov/2021		
Satisfactory quarterly project financial and monitoring reports submitted on time (Percentage) (disaggregated by report) (Percentage) (Percentage)	0.00	Aug/2016			100	Nov/2024	100.00	Jun/2024
Public Private Partnerships (PPP) established by POs (Number) (Number)								
POs with bankable Enterprise Development Plans (EDP) (Number) (Number)								

Grievances registered related to delivery of project benefits that are actually addressed (Percentage) (Core Sector Indicator) (Percentage) (Number)	0.00	Aug/2016			100.00	Nov/2021		
Participating counties including county-level project investments and community micro-projects into their Annual County Development Plans (Percentage) (Percentage)	0.00	Aug/2016			70.00	Nov/2021	100.00	Jun/2024
New or better jobs (Number of people) CRI								
	Comments on achieving targets		Not Applicable. The new Corporate Scorecard Indicators were not included in the Results Framework at approval.					
New or better jobs for youth (Number of people) CRI								
	Comments on achieving targets		Not Applicable. The new Corporate Scorecard Indicators were not included in the Results Framework at approval.					
New or better jobs for women (Number of people) CRI							0	Jun/2024
	Comments on achieving targets		Not Applicable. The new Corporate Scorecard Indicators were not included in the Results Framework at approval.					
Increase in project stakeholders accessing information through ICT platforms (Percentage) (disaggregated by platform) (Percentage) (Percentage)	0.00	Aug/2016			35.00	Nov/2021		
Agricultural and rural development infrastructure and NRM investments implemented under the project at the county level (Number) (Number)								
disaggregated by Agricultural and rural development infrastructure (Number) (Number)							122.00	

NRM investments (Number) (Number)								
Labor days completed by beneficiaries of employment programs supported by the project (Number) (Number)								
Of which labor days completed by female beneficiaries (Percentage) (Percentage)								
Satisfactory quarterly project financial and monitoring reports submitted on time (Percentage) (disaggregated by report) (Percentage)					100.00	Nov/2021		
Grievances registered related to delivery of project benefits that are actually addressed (Percentage) (Core Sector Indicator) (Percentage)								
Increase in project stakeholders accessing information through ICT platforms (Percentage) (disaggregated by platform) (Percentage)								

B. KEY OUTPUTS

Increase agricultural productivity and profitability of targeted rural communities	
PDO Indicators	1. Direct project beneficiaries 2. Direct beneficiaries who have adopted improved agricultural technologies, innovations and management practices (TIMPs) promoted by the project (Number) 3. Yield increase in the selected priority agricultural value chains supported by the project 4. Producer Organizations supported by the project reporting increase in profitability
Key Outputs (linked to the achievement of the PDO Outcome)	1. 528,945 beneficiaries reached, of which 59.30 percent were female against targets of 360,000 and 50 percent, respectively 2. 358,260 trained beneficiaries, of which 59 percent were female and a total of 342,966 adopted at least one TIMP against a target of 176,400 3. 44.1 percent yield increase in the selected value chians supported by the project against a target of 30 percent 4. 84 percent of FPOs supported by the project reported increase in profitability against a target of 70

Component 1: Supporting Community-Driven Development	
Intermediate Results Indicators	1. Client-days of training provided on TIMPs 2. Micro-projects implemented, disaggregated by windows (SLM and VC, VMG, Livelihood, and Nutrition) (Number) 3. Land area where sustainable land management (SLM) practices were adopted as a result of the project (hectare)
Key Outputs (linked to the achievement of the Component)	1. 1,354,945 client days of training provided on TIMPs against a target of 1,260,000 2. 18,890 micro-projects were implemented against a target of 12,000 3. 108,898 ha was brought under SLM against a target of 71,400
Component 2: Strengthening Producer Organizations and Value Chain Development	
Intermediate Results Indicators	1. CIGs and VMGs that are members of supported POs (Number) 2. Increase in annual sales turnover of targeted POs (Percentage) 3. Public Private Partnerships (PPP) established by POs (Number) 4. POs with bankable Enterprise Development Plans (EDP) (Number)
Key Outputs (linked to the achievement of the Component)	1. 12,585 CIGs/VMGs that are members of supported POs against a target of 8400 2. 30 percent increase in annual sales turnover of targeted POs against a target of 20 percent 3. 196 Public Private Partnerships (PPP) established by POs against a target of 21 4. 314 POs with bankable Enterprise Development Plans against a target of 84
Component 3: Supporting County Community-Led Development	
Intermediate Results Indicators	1. Participating counties including county-level project investments and community micro-projects into their Annual County Development Plans (Percentage) 2. Agricultural and rural development infrastructure and NRM investments implemented under the project at the county level (Number) 3. Labor days completed by beneficiaries of employment programs supported by the project (Number)

Key Outputs (linked to the achievement of the Component)	1. 100 percent of Participating counties including county-level project investments and community micro-projects into their Annual County Development Plans against a target of 70 percent 2. 149 Agricultural and rural development infrastructure and NRM investments implemented under the project at the county level against a target of 90 3. 2,088,789 labor days completed by beneficiaries of employment programs supported by the project against a target of 3,000, 000
Project Coordination and Management	
Intermediate Results Indicators	1. Satisfactory quarterly project financial and monitoring reports submitted on time (Percentage) 2. Number of grievances recorded 3. Number of grievances addressed/resolved 4. Increase in project stakeholders accessing information through ICT platforms (Percentage, disaggregated by platform) 5. Number of procurement/accounting staff trained on contract management modules
Key Outputs (linked to the achievement of the Component)	1. 100 percent satisfactory quarterly project financial and monitoring reports were submitted on time 2. 2,302 grievances recorded 3. 2301 grievances resolved 4. 62.9 percent of stakeholders accessed information through ICT platforms 5. 63 procurement/accounting staff trained on contract management modules

ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION

A. TASK TEAM MEMBERS

Name	Role
James Muli Musinga	Team Leader
Annastacia Waithera Wacheke	Financial Management Specialist
Joel Buku Munyori	Procurement Specialist
Boaz Okoth Akello	Procurement Specialist
Donald Mneney	Procurement Specialist
Ben Okindo Ayako Miranga	Environmental Specialist
Alidu Babatu Adam	Social Specialist
Dahir Elmi Warsame	Procurement Team
Robert Maina Waiganjo	Procurement Team
Mohammad Ilyas Butt	Procurement Team
Michael Macharia Njuguna	Team Member
Rose Njeri Mwaniki	Team Member
Beryl Winnie Atieno Agengo	Team Member
Marie Lolo Sow	Team Member
Rahmoune Essalhi	Team Member
Anna Lisa Schmidt	Team Member
Rose Chepkoech	Team Member
James Thumi Muturi	Team Member
Bodomalala Sehenoarisoa Rabarijohn	Team Member
Hope Nanshemeza	Team Member
Joel Onyango Khobondo	Team Member
Urbanus Mutunga Mutua	Team Member
Simon Francis Nguru Wandeto	Team Member

B. STAFF TIME & COST

Stage of Project Cycle	Staff Time & Cost	
	No. of Staff Weeks	US$ (including travel and consultant costs)
Preparation		
FY15	16.593	111,131.46
FY16	64.388	306,023.71
FY17	20.272	113,376.26
FY18	0.000	4,894.35
FY19	0.000	200,000.00
Total	101.25	735,425.78
Supervision/ICR		
FY15	1.000	9,951.54
FY16	0.000	9,083.80
FY17	1.525	14,736.05
FY18	21.817	147,978.21
FY19	71.583	778,123.94
FY20	65.929	1,194,886.48
FY21	55.053	584,555.22
FY22	24.650	265,517.77
FY23	2.858	86,279.68
FY24	6.425	71,235.52
FY25	6.067	50,130.22
Total	256.91	3,212,478.43

ANNEX 3. PROJECT COST BY COMPONENT

Component	Amount at Approval (US$M)	Actual at Project Closing (US$M)
Supporting Community-Driven Development	80	89
Strengthening Producer Organizations and Value Chain Development	50	51
Supporting County Community-Led Development	72	52
Project Coordination and Management	17	27

ANNEX 4. EFFICIENCY ANALYSIS

Kenya National Agricultural and Rural Inclusive Growth Project (NARIGP) (P153349)

Implementation Completion and Results Report

A. Background

This report contains the efficiency analysis for the Implementation Completion and Results Report (ICR) of the National Agricultural and Rural Inclusive Growth Project (NARIGP). The Efficiency Analysis assesses how economically resources and inputs were converted by the Project into results and impact.

The Project Development Objective (PDO) of NARIGP 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 immediate and effective response".

NARIGP had four components. Component 1, Supporting Community-Driven development (US$ 82.77 million[26]), aimed to strengthen: (a) community-level institutions' ability to identify and implement investments that improve their agricultural productivity, food security, and nutritional status; and (b) support investments in selected priority Value chains (VCs). Component 2 Strengthening Producer Organizations and Value Chain Development (US$ 44.66 million), aimed to build Producer Organizations' (POs') capacity to support member Common Interest Groups (CIGs) and Vulnerable and marginalized groups (VMGs) to develop selected priority VCs in targeted rural communities. Component 3, Supporting County Community-Led Development (US$ 45.53 million), aimed to strengthen the capacity of county governments to support community-led development initiatives identified under Components 1 and 2. Component 4, Project Coordination and Management (US$ 26.68 million[27]) financed activities related to national and county-level project coordination. The Contingency Emergency Response Component was not triggered.

NARIGP's implementation had a three-tiered institutional arrangement, with Tier 1 at the national level; the 2nd tier at the county level, with county governments as important executing agencies; and the 3rd tier at the community where beneficiaries implemented their community-led interventions.

NARIGP intervened in 21 Counties, namely in Arid areas - (Turkana and Samburu); Semi-arid areas-(Makueni, Kitui, Embu, Meru, Kwale, Kilifi and Narok); medium-to-high rainfall areas-(Kirinyaga, Kiambu, Murang'a, Nakuru, Bungoma, Trans Nzoia, Nandi, Vihiga, Kisii, Migori, Nyamira and Homa Bay). Within these Counties, 415 Wards were reached (20 Wards per County).

Each County selected three to four priority value chains, which included annual crops, fruit trees and livestock. The 14 priority value chains[28] were (i) annual crops: green grams (4 counties[29]), beans (1 county), local vegetables (3 counties), Irish potato (5 counties), cotton (1 county); (ii) fruit trees: avocado (4 counties), banana (9 counties), mango (3 counties), macadamia (1 county), coconut (1 county); and (iii) animal production: apiculture (7 counties), chickens (19 counties), small-scale dairy (17 counties), and shoats[30] (2 counties). These priority value chains were market-oriented (local, urban and/or export markets) with the potential to generate monetary revenues for farmers, while most of them also contributed to household food and nutrition security (beans, green grams, local vegetables, bananas, dairy). The interventions under

[26] Project expenditures IDA financing at completion.
[27] Including US$ 2 million prefinancing.
[28] NARIGP. Project Completion Report. 16 September 2024.
[29] Number of counties that selected a specific value chain between brackets.
[30] Shoats: sheep and goats

Component 2, aimed at linking the community groups to Farmer Producer Organizations (FBOs) and to markets, this to ensure that the incremental production would not cause local glut and lower prices at farm level.

The NARIGP was approved on 23 August 2016, became effective on 28 July 2017, and was scheduled to close on 15 December 2021. A level 2 restructuring in May 2017 changed the implementation agency from the Ministry of Devolution and Planning (MoDP) to the Ministry of Agriculture and Livestock Development (MoALD). The first disbursement took place in March 2018. The Mid-term Review (MTR) was undertaken in July 2019. The revised closing date was 31 March 2024, 27 months after the initial date.

At design stage, the total Project cost was estimated at US$219 million, financed through an International Development Association (IDA) credit of US$200 million and a national contribution of US$19 million, which included US$ 2 million from the Government of Kenya (Gok), US$ 7 million from the County Governments, and US$ 10 million from the beneficiaries as contribution to their micro-projects. Total disbursements amounted to KES 23.987 billion of which 85 percent was disbursed by the Counties and 15 percent by the National Project Coordination Unit (NPCU), indicating that Project implementation was truly decentralized.

B. Methodology

The ex-post economic and financial analysis (EFA) of the NARIGP focuses on the range of smallholder and PO-level investments co-financed by the Project, in the realm of priority value chain development and related economic benefits. The methodological approach of this EFA follows that of Gittinger (1982)[31], Belli et al. (2001)[32] and recent World Bank guidelines published on economic and financial analysis.

Data Collection and Sources. This Efficiency Analysis is based on a broad range of qualitative and quantitative data sources. The main sources of information were: (i) the NARIGP Project Appraisal Document (PAD, 2 August 2016); (ii) the 14 Implementation Status & Results Reports (ISR) and mission Aide-memoires; (iii) the NARIGP Project Completion Report (16 September 2024)[33], prepared by the Borrower, as well as the presentation "Economic and Financial Analysis of Investments in Smallholder farmers under NARIGP Project"[34]; (iv) impact stories and knowledge products published by the Project. Additional information was collected during the field missions and provided by the Project management team in September 2024.

A cash flow model is used to assess the ex-post efficiency of Project investments. As in the PAD (August 2, 2016), annual cash flows are estimated as the difference between without-project (WOP) and with-project (WP) net benefits for direct beneficiaries. Crop and livestock models were developed for the priority value chains, with assumptions on yields, output and input prices, capital investments, operational inputs, and labor amounts. The WP models account for the adoption of Technologies, Innovations, and Management Practices (TIMPs), that included improved crop and livestock husbandry, improved seeds and other inputs, and access to extension services. These are compared to the WOP scenarios of traditional farming practices.

The financial models are developed over either a 10 or 20-year period, depending on the nature of the investment, namely 10 years for the annual crop production models and 20 years for livestock models and the tree crops models (avocado, mango, coconut, banana). Family labor as well as hired labor are valued at a rural wage rate of KES 395 (official minimum salary, unskilled rural labor; US$ 3.1 per day). Market prices and WOP yields remain constant. Markets for produce are

[31] Gittinger, P., 1982. *Economic analysis of agricultural projects*
[32] Belli, P., J.R. Anderson, H.N. Barnum, J.A. Dixon, and J-P. Tan (2001). *Economic Analysis of Investment Operations: Analytical Tools and Practical Applications*. WBI Development Studies, World Bank Institute, World Bank, Washington, D.C.
[33] National Agricultural and Rural Inclusive Growth Project (NARIGP). Project Completion Report. September 2024. 139 p.
[34] Prepared by the EPR team in September 2024

assumed to be competitive and efficient, so that they can absorb surpluses produced by households without disturbing local market prices. Home consumption is valued at market price. The exchange rate is KES 128.75 for 1 US$ (2 September 2024).

The value of capacity building among direct beneficiaries is captured in the financial models. Project-funded capacity building and institutional development at all levels (lead farmers, FPOs, Community Driven Development Committees (CDDC), community groups, county staff, water user associations, etc..) have direct value as they increase the skill level in public sector institutions, beneficiaries of TIMPS and cooperatives, and enable them to work more efficiently using Project support and in providing essential and enhanced public or collective good services. Capacity building was provided by Sub-component 1.1 (Strengthening community-level institutions), Sub-component 2.1 (Capacity building of producer organisations), and Sub-component 3.1 (Capacity building of counties). These institutional benefits are not quantified in the analysis but are critical to ensure that the economic and other benefits can be realized when it comes to increasing crop and livestock production and productivity with access to extension services, and improved inputs. This will also lead to spill-over effects to subsequent work and projects undertaken by the strengthened institutions.

Outreach of the Analysis. The outreach of the Project, which is the basis for the aggregation of the economic analysis, is mainly derived from the PDO indicators in the Results Framework. At design stage, 360,000 persons were expected to benefit from the Project's investments, of which at least 50 percent would be female. At completion, the target was exceeded by 47 percent with 528,945 beneficiaries, of which 60 percent women, being reached with assets and services. Primary beneficiaries were rural smallholder farmers organized into Common Interest Groups (CIGs) of about 25 individuals. A total of 342,966 farmers adopted at least one TIMP[35]. The farmers benefitted from a broad range of activities, including investment support through matching grants (micro-projects), access to TIMPs and certified seeds, capacity building and extension services, and information on prices and markets.

The land area under sustainable land management amounted to 108,898 ha (Table 2). The average increase in productivity across the priority commodities was 41.1 percent and exceeded largely the targeted yield increase of 30 percent. Growth in productivity occurred against a backdrop of severe drought from 2020 to 2022.

Table 1: Summary of PDO Indicators by Outcome at Completion

Indicator	Unit	Baseline	End target	Achieved	Percentage achieved
Direct project beneficiaries	Number	0	360,000	528,945	147
Direct beneficiaries who have adopted improved agricultural technologies, innovations and management practices (TIMPS) promoted by the Project	Number	0	176,400	342,966	194
Yield increase in the selected priority agricultural value chains supported by the Project	Percent	0	30	41.1	147
Producer Organizations supported by the project reporting increase in profitability	Percent	0	70	84	120

Source: NARIGP. Results Framework. 16 September 2024

[35] The Project Completion Report (NARIGO, 2024) states that the number of beneficiaries adopting at least one TIMP are: poultry (188,493 households), dairy (67,588 households), banana (22,846), Irish Potato (15,372), green grams (13,605), apiculture (7,761), avocado (8,063), tomato (7,565), goat-sheep (4,545), local vegetables (4,515), mango (2,612).

Adoption rates and phasing. The EFA applied an adoption rate of 80 percent for farmers adopting TIMPs. This is in line with other projects in the region showing adoption rates of 70-80 percent.[36] Due to the slow start of disbursement of demand-driven micro-grants, the adoption of TIMPs at farm-level was supposed to have taken place only from year 4 onwards (2020). The phasing is aligned with the disbursement rate of the Project.

Economic Costs. The financial Project costs were converted into economic costs, using a conversion factor of 0.90, to remove all taxes and duties. As some of the Project costs, such as micro-projects and own contributions of farmers, are considered as inputs in the individual financial models, the total Project economic costs were adjusted to avoid double-counting by US$ 46.8 million, which is the Project's contribution to the micro-projects. Due to these corrections, the economic analysis is based on an economic Project cost of US$154.8 million. As part of the exit strategy, recurrent costs of US$3.1 million per annum (2 percent of the total economic Project costs) are added to ensure continued support for extension and maintenance of technologies after the Project ended.

Conversion Factors. Financial models have been converted into economic models by applying standard conversion factors (SCFs), namely: SCF for imported goods 1.06; Standard Exchange Ratio (SER) for exported products 0.94; Shadow Wage Rate Factor 0.94; Shadow Conversion Factor (SCF) 1.06; Conversion factor for non-tradable goods 1.0. These SCFs are used to exclude all transfer payments including taxes, subsidies, grants, loans, interest and principal payments.

Discount Rates. For the economic analysis, a 6 percent discount rate[37] was adopted, which reflects the social opportunity cost of capital in Kenya. NARIGP was designed in 2016 when National Economic growth was 5.9 percent. The World Development Index Database shows a positive Kenyan GDP per capita growth from US$1,562 (2016) to US$ 1,950 (2023) during the implementation period, or an average GDP per capita growth rate of 3.5 percent per annum. According to World Bank guidelines, a 3 percent per capita growth rate translates into a 6 percent social discount rate, and per capita growth rates of 1-5 percent yield discount rates in the range of 2-10 percent. Consequently, a sensitivity analysis was undertaken for the social discount rate (2 percent, 5 percent, 6 percent, 12 percent).

The financial analysis is based on a 15 percent discount rate, which reflects the opportunity cost of capital in Kenya.

Summary of the Ex-ante Economic and Financial Analysis (2017)

Financial analysis. At design stage, eight crop and livestock models are developed for a selection of priority value chains (VCs), each of them with a 'with' and 'without' Project (WP and WOP) situation to analyze the financial performance of the investments that were supported. These included bananas, mangoes, tomatoes, maize, beans, sorghum, green grams, milk production, honey, and local poultry. The Agricultural Sector Development Support Program (ASDSP) identified these VCs as some of the top priority VCs in the 21 participating counties. All VCs were selected by at least one district, except sorghum. Core financial performance indicators used are the financial Internal Rate of Return (IRR), Benefit-Cost Ratio (BCR), Gross Margins, Net Present Value (NPV), and Return to Family Labour. The NPVs in the ex-ante EFA range from US$ 577 for intercropped maize and beans to US$ 12,142 for banana cultivation. The BCRs ranged from 1.3 for sorghum and green grams to 13.1 for banana.

The **ex-ante economic analysis** aggregated the incremental benefits related to potential reductions in GHG emissions, while factoring in the Project's economic costs. The resulting Economic Net Present (ENPV) calculated over a span of 20 years and using a discount rate of 5 percent was US$827 million; the Economic Rate of Return (ERR) was 21.8 percent. Sensitivity analyses performed for the economic analysis demonstrated that the Project would be capable of absorbing substantial

[36] Examples include: 74 percent adoption rate in the Uganda-National Agricultural Advisory Services Project (NAADS) and 70-80 percent adoption rate in the IFAD Rwanda Project for Rural Income through Exports (PRICE). In the Pro-poor Value Chain Project in the Maputo and Limpopo corridors (PROSUL) economic and financial analysis, an 80 percent adoption rate was assumed in the project area. The ZIFLP ICR (Malawi) uses an adoption rate of 61 percent.
[37] In conformity with the World Bank Technical Note on Discounting Cost and Benefits in Economic Analysis.

negative impacts (e.g., a decline in incremental net benefits, a decline in technology adoption rates, and an increase in investment costs) and still generating an ERR of at least 14 percent, which was above the opportunity cost of capital and thus supported the investment decision.

The ex-ante net carbon balance results estimated in 2016, using the EX-ACT tool, was expected to have the potential for reducing GHG emissions by -2,380,387 tCO2-eq over 20 years, or -119,019 tCO2-eq per annum. The analysis was based on a relatively small target area of about 26,700 ha, which resulted on average in -4.5 tCO2-eq per ha/year.

C. Project Achievements, Beneficiaries and Benefits

This section discusses the intermediate results of the Project that are at the basis of the ex-ante economic and financial analysis. The table below summarizes the intermediate results indicators by Component.

Component 1 aimed to scale up the implementation of CSA practices to achieve triple-wins of increased productivity; enhanced resilience (adaptation) and reduced GHG emissions (mitigation) per unit of output. The entry point for scaling-up the use of TIMPs and good agricultural practices (GAPs) in the 14 priority value chains was the mobilization of common interest groups (CIGs) and vulnerable and marginalized groups (VMGs). A total of 18,890 micro-projects, prepared by the CIGs[38] and VMGs[39], were approved, financed and completed. The value of micro-projects funded was KES 5.98 billion (approximately US$ 46.8 million or 2459 US$ per micro-project). The CIGs contributed 10 percent, which enhanced ownership. The Project also promoted SLM TIMPS that included physical and biological soil and water conservation measures for a total land area of 108,898 ha.

Under Sub-component 2.1 (Capacity Building of Producer Organizations), producer organizations (POs) were strengthened along the targeted value chains. A total of 12,585 CIGs and VMGs became members of FPOs. A total of 248 POs received inclusion grants[40] to enhance their market linkages. The 269 POs supported by the Project were active in dairy (28.6 percent), poultry (19 percent), banana (10.8 percent), apiculture (6.7 percent), Irish potato (5.9 percent), mango (5.6 percent), coffee (4.5 percent). About 19 percent of POs were active in the other value chains. The increase in turnover for POs across various value chains was 30 percent, while 85.5 POs reported growth in turnover. Gross profit was, however, mainly centralized in dairy FPOs (74.8 percent) and coffee (14.6 percent). Public-private partnerships (PPPs) were established between 196 FPOs (Co-operatives, Community-based Organizations (CBOs), farmers associations) and private companies to enhance produce aggregation and market linkages in the priority value chains.

A total of 314 FPOs received prepared their Enterprise Development Plans (EDPs) and 98 EDP grants were disbursed to FPOs. The total funds disbursed for the EDP projects were KES 752.9 million (US$ 5.85 million), with an average cost of US$ 59,672.

Table 2: Type of matching grants financed by the Project

Type of matching grant	Beneficiary	Number	Amount (million US$)	Average amount (US$)
Micro-project	CIG/VMG	18,890	46.45	2,459
Inclusion grants	FPO	248	1.85	7,474
Enterprise Development Plans	FPO	98	5.85	59,672
Value Chains Upgrading Matching Grant Investments	FPO	77	10.82	140,521

[38] CIGs matching grants in the range of KES 700,000 – 1,000,000 (US$7,000 – 10,000). Own contribution 10 percent.
[39] VMGs matching grants in the range of KES 300,000 – 500,000 (US$3000 – 5,000.) No own contribution required.
[40] Inclusion grants: KES 238.64 million (US$ 1.854 million), average grant US$ 7,474

Total			**64.97 million**	

The Project completion report (NARIGP, 2024) indicated that gross profit of the 269 POs supported by the Project increased by 35 percent, from KES 853.77 million to KES 1,154.95 million. The additional gross margin amounts to US$ 2.34 million per annum.

Under Sub-component 2.2 (Value chain Development), a total of 77 Value Chains Upgrading Matching Grant Investments were funded for an amount of KES 1.4 billion (US$ 10.8 million), with an average cost of US$ 140,521.

Component 3 (Supporting County Community-Led Development) supported counties to finance 149 agricultural and rural development infrastructures and natural resources management (NRM) investments. This was combined with capacity building in community-led development of agricultural and alternative livelihoods.

Table 3: Intermediate Results and Outputs Achieved by NARIGP

Intermediate Results Indicator	Baseline	End Target	Achieved at Completion	Percentage achieved
Component 1: Supporting Community-Driven Development				
Client-days of training provided on TIMPs, share of which female (Number)	0	1,260,000	1,354,945	107
Female beneficiaries (Percent)	0	50	68	136
Micro-project proposals approved		17,975	18,890	105
Land area where sustainable land management (SLM) practices were adopted as a result of the Project (ha)	0	71,400	108,898	153
Component 2: Strengthening Producer Organizations and Value Chain Development				
CIGs and VMGs that are members of supported FPOs (Number)	0	8,400	12,585	150
Increase in annual sales turnover of targeted FPOs (percent)	0	20	30	150
Public Private Partnerships (PPPs) established by FPOs (Number)	0	21	196	933
FPOs with bankable Enterprise Development Plan (EDP) (Number)	0	84	314	374
Component 3: Supporting County Community-Led Development.				
Participating counties including county-level project investments and community micro-projects into their Annual County Development Plan (percent)	0	70	100	143
Agricultural and rural development infrastructure and NRM investments implemented under the project (Number)	0	45	149[41]	331
Labor days completed by beneficiaries of employment programs supported by the project (Number)	0	3,000,000	2,088,789	70

Source: Project Completion Report; Implementation Status & Results Report.

[41] 149 investments of which 122 in agricultural and rural development infrastructure and 27 NRM investments.

D. Financial Analysis

This financial analysis looks at the impact of the TIMPs on smallholder farming in the priority value chains. Fourteen financial crop and livestock models were developed. For annual crop production, the models were beans, cotton, green grams, Irish potato, and tomato[42]. For fruit trees, models were developed for bananas, avocado[43], mango[44] and coconut[45]. The livestock models were small-scale dairy, goats/sheep, poultry[46], and beekeeping[47].

The table below presents resulting yield increases from the adoption of the TIMPs for the six crops. The average yield increase is 41 percent. The significantly higher crop and livestock productivity resulted in surplus production, higher consumption at household level, higher sales and household incomes. For crop and fruit production, these technologies included the use of improved (certified) CSA seeds, improved agronomic and crop husbandry practices (line seeding, mulching, manure, additional chemical fertilizer, hermitic bags, etc..).

Table 4. Yields of annual crops without and with Project

Crop	WOP (kg/ha)	WP (kg/ha)	Percent increase
Bananas	16,200	27,864	72
Beans	600	720	20
Cotton	1,700	2,380	40
Green Grams	1,100	1,485	35
Irish Potato	10,000	14,100	41
Tomato	13,455	20,430	52
Avocado		12,000	
Mango		11480	

For the livestock value chains, the TIMPs were based on the use of improved breeds (also AI for dairy animals), improved feeding practices and fodder production, vaccination and disease control, and improved animal husbandry (herd management, animal health), better linkages with dairy cooperatives and markets. For beekeeping (apiculture), the main innovation was the use of modern beehives.

Table 5 summarizes the financial performance of the crop and livestock models for the priority value chains, based on a comparison between WP and WOP situation. The standard financial performance indicators are presented, namely IRR, FNPV, BCR, Gross margin, Return to Labor. This analysis confirms the financial viability of the TIMP investments by the Project beneficiaries. There are however some significant differences between value chains. In general, the return to labor (between US$ 7.3 and 32.8 per day) is significantly higher than the rural minimum salary of US$ 3.1 per day. Also, the BCRs are attractive, between 1.27 and 4.5, higher than the commercial interest rate of 15 percent, which is used to calculate the Financial Net Present Value (FNPV).

For **annual crops** such as cotton, green grams and beans, the Return to Family Labor varies between US$ 7.3 and 12.2 per day. The TIMPs used are mainly improved seeds, improved crop husbandry, and the use of manure. Green grams and beans are both cash crops and nutritious food security crops. Even if the return to family labor is low, households will continue to

[42] Tomato is used as proxy for local vegetables.
[43] New avocado plantation, 1 ha.
[44] New mango plantation, 1 ha.
[45] New coconut plantation, 1 ha.
[46] 150 layers WP
[47] 5 modern hives

produce beans and green grams, often in association with bananas. They have the advantage that they can easily be sold in the local market in case of urgent cash needs.

Irish potato and tomato are very profitable and are cash crops when produced at a larger scale. In this case, the required a high technicity which is ensured by the lead farmers in the model. Off-season prices for potatoes are often 100 to 300 percent higher than during the main production season. Therefore, the use of Farmer-led irrigation systems that were promoted by NARIGP to extend the main cropping season and even produce 2 cycles per annum, while reducing the exposure to climate hazards. The gross margin is US$ 2,204 for Irish Potato and US$ 6,343 for tomato. The return to labor is US$ 21 per day for Irish potato and US$ 9.5 per day for tomato.

Fruit trees (mango, coconut, avocado) are very profitable endeavors as shown by all financial performance indicators, but the initial investment costs are significantly higher than for annual crops and it takes 4 to 5 years before the first harvest. In addition, sufficient land in full ownership is required. Commercial fruit production for the export market requires a high level of technical skills and knowhow. To sell the harvest at a remunerative price, it is also required to have good market access through a membership of a well-functioning cooperative. Given these constraints, not every household is able to invest in fruit trees for commercial production. For banana, which is a staple food, the access barriers are lower as the production can also be consumed at local level or marketed locally. The IRRs are 21 percent for mango, 33 percent for avocado, 34 percent for coconut and 47 percent for banana. The return to labor is very interesting, between 25.2 US$ per day for coconut and 32.8 US$ per day for mango. The BCRs vary between 1.56 and 3.69, which is sufficient compared to the commercial interest rate and allows to purchase inputs on credit.

Small-scale dairy is profitable. It provides the household with a small daily revenue for about 300 days per annum. In case of a milk price of KES 200 per liter, a family that owns one cow can easily have an income of KES 600 per day. Milk can be consumed at household level and surpluses sold in the consumer market or to local dairy cooperatives and collection points. To grow the business, membership of a dairy cooperative is required. Technical backstopping and input supply is generally provided by the dairy cooperatives. The IRR is 32 percent, the FNPV of US$ 2,872 per household.

Local poultry production (both for eggs and poultry meat) was very popular amongst women in NARIGP. The poultry sector is very competitive, with the ratio between outputs (eggs, poultry meat) and inputs (poultry feed) as key profitability factor. Most inputs (feed, one-day chickens, vaccines) are purchased. Both input and output prices are determined by the markets. As small-scale poultry production competes directly with the large-scale production units that emerge in peri-urban areas, competition can be strong. The low BCR (1.01) indicates that profit margins are very thin. This implies that very good technical skills are required to manage this enterprise, and losses can occur due to fluctuating market prices of poultry feed or prices of eggs.

Goats and sheep (shoats) are considered as an interesting side activity on the farm, which is important for household food security. In case of urgent cash needs, it is easy to sell an animal. The high BCR (4.5) is an indication of the now need for external inputs.

Apiculture (beekeeping) is technically challenging but very rewarding for young people. In the WP situation, modern beehives are used that allow harvesting honey without damaging the bee colony. Beekeeping can be undertaken at any scale and is therefore easily accessible for young people. In general, honey has good market demand in East Africa and interesting prices. The IRR is 49 percent, with a return to labor of US$ 9 per day.

Table 5. Financial Performance of the Crop and Livestock Models (comparison WOP – WP)

Model	Unit	FNPV @15 percent (US$)	Benefits/Cost Ratio (BCR)	Annual gross margin (US$)	Return to labor (US$/day)	IRR (percent)
	Crop Production					
Beans	Ha	793	2.16	817	12.2	
Cotton	Ha	79	1.62	729	7.9	
Green Grams	Ha	115	1.58	484	7.3	
Irish potato	Ha	1,354	1.27	2,204	21.0	
Tomato	Ha	5,427	2.33	6,343	9.5	
	Fruit Trees					
Bananas	Ha	7,273	3.69	7,717	26.6	47
Avocado	Ha	4,732	1.56	2,513	26.7	33
Mango	Ha	4,881	1.64	5,642	32.8	21
Coconut	Ha	5,306	2.16	2,366	25.2	34
	Animal Production					
Small-scale Dairy	Household	2,873	1.53	584		32
Poultry	Household	2,702	1.01	587	7.3	169
Shoats (sheep and goats)	Household	275	4.50	510		28
Apiculture	Household	878	1.28	515	9.4	49

Source: Own calculations, based on data collected by the Project.

E. Economic Analysis

Economic Benefits of the Project

The Project's economic cash flow represents the overall Project aggregation of incremental economic costs and benefits. It includes the net incremental benefits of each financial model in economic terms, converted with Standard Conversion Factors or shadow prices. The economic costs have then been deducted from the overall economic benefit stream to obtain the Project's net incremental benefit stream. Conservative assumptions and parameters have been applied, to avoid overestimation of benefits and provide realistic results.

This economic analysis of NARIGP is based on (a) the benefit flow from investments by 342,966 households[48] who benefited from micro-projects and adopted TIMPs in the 15 priority value chains; (b) incremental benefits, resulting from investments in FPOs and cooperatives; according to the Project completion report (NARIGP, 2024), the additional gross margin of the 269 FPOs that were supported by the Project amounted to US$ 2.34 million per annum; and (c) monetized environmental benefits expected to accrue from reduced GHG emissions and increased carbon sequestration, calculate using Ex-ACT (see below).

Results of Economic Analysis

Overall, the economic results of the Project are positive, generating an Economic Net Present Value (ENPV), at 6 percent social discount rate of US$ 431.69 million and an economic rate of return (ERR) of 22.8 percent (over a 20-year period), not accounting for environmental externalities (GHG accounting). The economic BCR ratio is 4.26. These economic results are

[48] The Project Completion Report (NARIGO, 2024) states that 342,966 beneficiaries adopted at least one TIMP. These value chains were: poultry (188,493 households), dairy (67,588), banana (22,846), Irish Potato (15,372), green grams (13,605), apiculture (7,761), avocado (8,063), tomato (7,565), goat-sheep (4,545), local vegetables (4,515), mango (2,612).

satisfying, given that several other Project benefits in the realm of institutional strengthening at county level could not be quantified due to the difficulty of assigning them a monetary value.

A switching values analysis is also included, where each assumption is changed until the ENPV turns zero (i.e. a break-even analysis). For example, the ENPV turns zero if all benefits drop by 75.7 percent or if the Project costs increase by 312 percent. The switching values indicate that the benefits are quite solid.[49]

Table 6: Summary of Economic Analysis (Base case scenario)

Indicators	Results, excl. Carbon mitigation
ERR	22.8 percent
NPV (million US$, @6 percent, 20-years)	431.69
NPV benefits (million US$, @6 percent, 20 years)	570.16
NPV costs (million US$, @6 percent, 20 years)	138.47
B/C ratio	4.12
Switching value benefits	-75.7 percent
Switching value costs	311.7 percent

Comparison ex-ante and ex-post EFA

The ERR of 22.8 percent is slightly higher than the ex-ante ERR (2016) of 21.8 percent, which is due to the higher outreach of the Project than initially planned. The lower ex-post ENPV of US$ 431.7 million compared to the ex-ante estimate of US$ 827 million is because Project implementation was slow during the first 3 years (more years of discounting benefits). In addition, it was decided to use a social discount rate of 6 percent instead of the 5 percent rate that was used in the ex-ante analysis.

Sensitivity analysis

The World Bank guidance recommends as good practice to undertake a sensitivity analysis of the social discount rate. The table below presents the discount rate sensitivity, for 12 percent, 6 percent (base case ex-post EFA), 5 percent (ex-ante EFA scenario), 3 percent, and 2 percent. As expected, the ENPV remains very solid under the different scenarios. Using the ex-ante social discount rate of 5 percent would result in an ENPV of US$ 510.04 million.

Table 7: Sensitivity Analysis of Social Discount Rate

Discount Rate (Percent)	ENPV (US$, million)
12	151.19
6	431.69
5	510.04
3	710.62
2	838.62

Results of the economic analysis were also tested for sensitivity to variations in benefits and various lags in the realization of benefits. Individually taken, all scenarios show robust results under all hypothetical situations.

Table 8: Sensitivity Analysis of Project Benefits

Scenario	ERR (percent)	ENPV (US$, million)

[49] Because the Project's impact on the GHG emissions (carbon balance) is calculated in the separate EX-Ante Carbon-balance Tool, it was only possible to run a limited sensitivity analysis inside the EFA model. In the sensitivity analyses presented in this report, the carbon balance estimates only change when adoption rates are changed, or when analyzing Project delays.

Base case @6 percent	22.8	431.7
2percent social discount rate	22.8	838.6
12percent social disc. Rate	22.8	431.7
costs +10 percent	21.7	417.8
costs +20 percent	20.6	404.0
costs +30 percent	19.7	390.1
benefits +10 percent	23.9	488.7
benefits +20 percent	24.9	545.7
benefits -10 percent	21.5	374.7
benefits -20 percent	20.1	317.7
benefits -30 percent	18.6	260.6
benefits delayed 1 year	20.2	359.8
benefits delayed 2 years	17.8	292.0

Economic Rate of Return, including Environmental Benefits (Carbon mitigation).
Using the World Bank's Guidance note[50] on shadow price of carbon in economic analysis (2022), the social value of these environmental benefits has been also included in the overall economic results, using the low and high estimate range for the social price of carbon.

The carbon balance is defined as the net balance across all GHGs expressed in CO2 equivalents (CO2e) that will be emitted or sequestered due to the Project (WP), as compared to a business-as-usual scenario (WOP). A 20-year period is being considered.

The carbon balance was calculated by using EX-ACT, a tool developed by the FAO, to quantify the volume GHGs mitigated by the Project. EX-ACT is a Tier-1 land-based accounting system, estimating CO2e stock changes (i.e. emissions or sinks of CO2) expressed in equivalent tons of CO2 per hectare and year. The Project brought 108,898 ha under sustainable management, while also investing in livestock (dairy, goats, poultry), as well as in annual and perennial crops. The result shows marginal carbon emission savings for the Project of 2,327,343 tCO2eq over a period of 20 years, equivalent to 116,367 tCO2eq per year.

The monetary value of the GHG balance has been estimated and considered as economic benefit of the Project in the EFA. The World Bank's Guidance Note on Shadow Price of Carbon in Economic Analysis (September 2021) recommends "projects' economic analysis use a low and high estimate for carbon pricing. In the case of NARIGP, carbon prices increase from 37 US$/tCO2eq in 2017 to 67 US$/tCO2eq in 2036, and high estimate of the carbon price increasing from 75 US$/tCO2eq in 2017 to 135 US$/tCO2e in 2036[51].

Including the carbon mitigation valued at the low carbon price estimate range, the Project is expected to generate an ENPV of US$ 483.9 million and an ERR of 24.8 percent. When using the high market price estimate range for carbon, the Project could generate an ENPV of US$ 535.8 million and an ERR of 26.9 per cent. These scenarios are summarized in the table below.

[50] World Bank's Guidance Note on Shadow Price of Carbon in Economic Analysis (September 2021)
[51] When the EFA was conducted for the PAD, World Bank Guidelines suggested a social cost of carbon of US$30 per MT CO_2-eq. World Bank (2014) Social Value of Carbon in project appraisal. Guidance Note to the World Bank Group staff. Washington, DC, July 2014. A later guideline recommends 2018 shadow price of carbon at US$38 per MT CO_2-eq increasing by 2.25 percent each year (World Bank, 2017). The guideline also recommends a high price scenario starting at US$77 per MT CO_2-eq. In 2021, the guideline was updated again.

Table 9: Scenarios for Valuation of Environmental Benefits

Indicators	Results excl. Carbon mitigation	Results incl. carbon mitigation, valued @ low price estimate range	Results incl. carbon mitigation, valued @ high price estimate range
ERR (percent)	22.78	24.84	26.93
ENPV (million USD, @ 6 percent)	431.7	483.9	535.8
ENPV benefits (million USD, @ 6 percent)	570.2	622.3	674.3
ENPV costs (million USD, @ 6 percent)	138.5	138.5	138.5
EB/C ratio	4.12	4.49	4.87
Switching value for benefits (percent)	-75.7	-77.7	-79.5
Switching value for costs (percent)	311.7	349.4	387.0

F. Project Efficiency

Efficiency is a measure of how economically project resources are converted into results. It is therefore related directly to economic analysis.

Overall, the NARIGP implementation structures were largely effective in carrying out their intended functions. The Project implementation strategies were largely followed, although putting in place the required county-level implementation capacity and building their capacity took more time than initially planned. Also, the COVID-19 pandemic and national elections caused additional delays. On the other hand, the magnitude of CDDC, CIG, VMG and FPO mobilization, preparation of proposals for micro-projects and speed of disbursement, once the implementation mechanism was operational, shows the efficiency of the approach at county and community level. The CDDCs were effective in assisting communities to procure inputs and monitor project implementation at ward level, hence enabling the project to gain ownership and improved chances of sustainability. Also, the use of the lead farmer model/CBFs was timely and effective.

The expenditures for sub-projects and micro-projects were as per budgetary plans. The disbursement of funds for both sub-projects and micro-projects were generally delayed, largely because of the fund management structures at the counties, and the change in leadership in some counties and at the national government level. After capacity building of these institutions, disbursements were fast.

Budget Allocation at National and County Levels

Total disbursements of NARIGP were KES 23.987 billion, of which 85 percent was transferred to the counties and only 15 percent was disbursed at the national level. The table below presents the budget before and after restructuring.

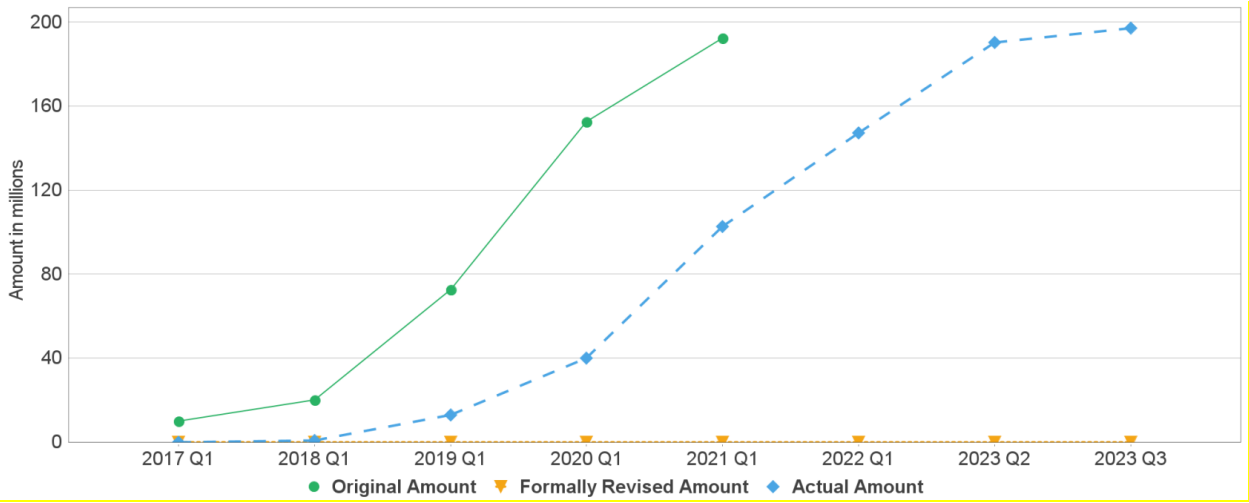
Table 10: NARIGP Cost and Financing before and after Restructuring (US$ million)

Component	Project Cost at design	Proportion of total percent	Project Cost After Restructuring (US$ million)	Proportion percent
Supporting Community-Driven Development	80	37	89	40
Strengthening Producer Organizations and Value Chain Development	50	23	51	23
Supporting County Community-Led Development	72	33	52	24
Project Coordination and Management	17	8	27	12

Project Prefinancing			2	1
Contingency Emergency Response	0		0	0
Total	219	100	219	100
IDA	200	91	200	
GOK + beneficiaries	19	9	19	

Planned vs Actual Project Timeframe

The graph below shows the planned versus actual disbursements (Implementation Status and Review Report, November 2023). The NARIGP has experienced delays in the implementation of county level investments, especially the micro-projects and sub-projects, which are the core investments of the Project. It was therefore agreed that to ensure successful completion of the Project and tide over the above implementation delays, there is a need to extend the closing date by 27 months to allow for all investments under the Project to be completed successfully.



Cost per Direct Beneficiary

Given a cost of US$ 200 million (IDA contribution) and 528,945 direct beneficiary households, the Project cost amounts to US$ 378 per household. Assuming 5 members per household, the cost was US$ 76 per household member, which is acceptable.

Abbreviations and Acronyms

BCR	Benefit-Cost Ratio
CDDC	Community Driven Development Committee
CIG	Community Interest Group
CO_2-eq	Carbon Dioxide Equivalent
CSA	Climate-Smart Agriculture
EBCR	Economic Benefit Cost Ratio
EFA	Economic and Financial Analysis
ERR	Economic Rate of Return
ENPV	Economic Net Present Value
EX-ACT	Ex-Ante Carbon Balance Tool
FAO	Food and Agriculture Organization
FBCR	Financial Benefit Cost Ratio
FCS	Food Consumption Score
FFS	Farmer Field Schools
FNPV	Financial Net Present Value
FPO	Farmer Producer Organization
IRR	Financial Rate of Return
ISFM	Integrated Soil Fertility Management
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GHG	Greenhouse Gas
GoK	Government of Kenya
ha	Hectare
ICRR	Implementation Completion and Results Report
IDA	International Development Agency
ISR	Implementation Status & Results Reports
KES	Kenyan Shilling
M&E	Monitoring and Evaluation
MoALD	Ministry of Agriculture and Livestock Development
MoALD	Ministry of Devolution and Planning
MTR	Mid-term Review
NAIP	National Agricultural Investment Plan
NPCU	National Project Coordination Unit
NPV	Net Present Value
PAD	Project Appraisal Document
PDO	Project Development Objective
PIU	Project Implementation Unit

PO	Producer Organization
RF	Results Framework
SCF	Standard Conversion Factor
SER	Standard Exchange Ratio
TIMP	Technologies, Innovations and Management Practices
US$	United States Dollars
VC	Value Chain
VMG	Vulnerable and marginalized group
WOP	Without Project
WP	With Project

ANNEX 5. EXAMPLES OF POTENTIAL TIMPs FOR SCALING UP CSA

Climate smart technologies, innovation, and management practices (TIMPs): All the TIMPs which were scaled up, validated and developed (new ones) were assessed with reference to the Food and Agriculture Organization (FAO) CSA Manual with set criteria to determine their 'climate smartness'. A total of 1,567 TIMPs were classified as climate smart, 423 were scaled up through Training of Trainers (ToTs) and Lead Farmers (LFs) trainings, 172 were validated and 140 new ones were developed. This thorough classification is essential to NARIGP as it defines the link between the TIMPs adoption and the impact on resilience. Examples of potential TIMPs for scaling up CSA are provided below.

Table 1. Examples of potential TIMPs for scaling up CSA

Type of TIMPs	**Agro-pastoral Production Systems**		**Pastoral production System**	
	CIG/VMG	**County**	**CIG/VMG**	**County**
Sustainable Landscape Management	• Conservation agriculture • Crop rotation and diversification • Use of drought-resistant/tolerant crops • Forage production, storage, and marketing • Small scale fattening operation • Small-scale, farmer-managed irrigation • Compost production plant (household waste management) • Windbreaks, hedgerows, enhanced clearing, live-hedge establishment • Promotion of non-timber forest products • Creating agro-forestry parks • Nursery (village or individual) • Promoting alternative domestic energy/reducing wood energy utilization	• Demarcation and restoration of livestock migration routes and common grazing land • Rangeland management and restoration (e.g., eradication of invasive species, reseeding)	• Forage production, storage, and marketing • Small scale fattening operation	• Demarcation and restoration of livestock migration routes and common grazing land • Supporting breeding programs (heat- and drought-tolerant livestock breed) • Feed and water buffer improvement, fodder banks • Promoting dry season grazing • Rangeland management
Water Management	• Development/rehabilitation of small-scale irrigation schemes	• Water pans/sand dams • Cattle dips	• Development of ponds	• Dredging of waterways • Development of ponds,

	• Promotion of water and energy conservation technologies for water lifting (possibly solar, treadle, and energy-efficient pumps) • Promotion of water conservation technologies for water distribution (drip irrigation and California system)	• Dredging of waterways • Development of ponds • Rehabilitation of small and medium-size irrigation schemes		boreholes, water pans, sand dams, etc.
Animal Health		• Infrastructure for vaccination and support to livestock services • Cattle dips		• Infrastructure for vaccination and support to livestock services • Cattle dips • Disease surveillance, vaccination, quarantine • Support for development of disease-free zones
Crop-livestock Integration	• Crop residue chopping, storage material, and facilities • Manure storage • Feed storage facility	• Feed/input shop		
Energy	• Promoting Biogas, renewable energy and energy efficiency in agricultural operations			
Market Access	• Sale yards	• Market infrastructure upgrade and market linkages • Collecting sheds/aggregatio		• Upgrading of abattoir facilities • Market infrastructure upgrade • Rural roads

		n and market centers • Rural roads • Market infrastructure development		
Livelihood Diversification	• Fisheries • Beekeeping • Small scale irrigation along the river • Value addition of livestock and crop products • Crop diversification • Off-farm employment		• Poultry • Beekeeping • Value addition of livestock and crop products • Off-farm employment	

ANNEX 6. NARIGP IMPACT STORIES

Box 1: Expanding farmers' knowledge and increasing incomes through large-scale investment in Farmer Field Schools [52]

Farmer field schools (FFFS) were an integral part of NARIGP and they assisted farmers in developing their businesses, increased their knowledge and helped to increase household incomes. The FAO investment Centre helped design and supported the implementation of NARIGP by promoting country-wide use of FFSs. One beneficiary of the FFS is Ms. Esther Kyalo who participates in the Kavakaky FFS in Miambani ward, Kitui county. Every Tuesday, together with around 35 other women from her area, she walks to a nearby house where the group meets and breeds chicks in the small but brand-new poultry house. They also discuss, observe, learn, and make decisions to improve their husbandry practices. The sessions are also designed to empower participants in selecting and implementing new TIMPs. Esther's FFS group divides into three, and each sub-group conducts a livestock analysis, which involves observing, measuring and collecting data on the animals' weight, height and health. Esther's group focuses on different feeds and their impact on chicks' health and growth. Once the data is gathered, each group presents its findings, discusses them with the larger group and suggests actions, such as choosing the best type of feed. Beyond new knowledge, FFSs have enabled Esther and her community to produce and sell their products together and to have better access to information and innovation.

Another farmer in the same county, Mr. Josphat Muthui Kangata now accommodates a group of honey producers every Friday at his home. Facilitated by Ruth Kavinya, a community-based farmer, the sessions' objective is to improve the quality and quantity of the honey they produce. In Kenya's arid and semi-arid lands, such as Kitui, livestock production, including beekeeping and chicken brooding accounts for almost nine-tenths of a family's income. Therefore, transitioning from family farming to commercialization can significantly enhance farmer incomes and reduce rural poverty. In that, FFSs have played an integral part.

Before the FFSs, both Esther and Josphat were experiencing difficulties on their farms including high chicken mortality rates, slow growth, low incomes. Before the FFSs, Esther had between 10 to 15 chickens. Now, she has 295. Josphat, on the other hand, was already producing some honey but selling it at a very low price, given its poor quality. Yields were low, due to the destruction or escape of some bees during harvesting. With slight modifications to the traditional log hive, his honey is now pure. Before the FFS, Josphat would package merged honey and honeycomb and sell it at KES 80 (USD 0.62) a kilo. Now, he harvests pure honey and sells a kilo at KES 1 000 (USD 7.80). Beekeeping has become his exclusive source of revenue. With new bee feeding and watering techniques, pest control and safety practices, Josphat's group has increased their beehives from seven to 48. This is in line with the project-wide yield increase percent change from apiculture which was 41.8.

[52] The FFS success story was featured by the FAO Investment Centre and a video was also produced to show the impact of FFSs on farmer income and productivity under the NARIGP project.

Box 2: Disruptive Agricultural Technologies (DAT)

The One Million Farmer Platform – an innovative approach for leveraging data, digital technologies, and innovation for the delivery of last mile services to farmers

The One Million Farmers Platform (OMFP) was piloted through the Korea World Bank Partnership Facility (KWPF) in 2019-2020. The pilot was extremely successful, despite the COVID-19 crisis and the model was integrated as a feature of NARIGP and KSCAP. The objective was to bring together ag-tech start-ups (DATs) selected by innovation challenges and county governments to facilitate their partnership and their use as service providers to CIGs, FPOs and SACCOs, and to develop a scalable framework for public-private partnerships (PPPs). These features are now integrated into the new NAVCDP. The OMFP demonstrated the use of digital technologies to enhance productivity and profitability of farmers, through extension information and credit to farmers, leveraging tech platforms to enable access to markets, and use of apps and platforms to enable access to good quality inputs like seeds and fertilizers for farmers.

The initial success of the initiative led to an increase in the number of ag-techs from 14 to 27, and an increase in counties covered from 8 to 16. There has also been an increase in the number of sensitized smallholders - over 400,000 with over 175,000 having adopted at least one of the digital solutions (NARIGP PMIS). By the end of NARIGP, these partnerships involved 27 DATs, resulting in service provision of input delivery, climate advisories, access to credit and markets to nearly half a million farmers. The result was a win-win situation:

- Farmer acquisition costs were reduced through DATs' access to the community infrastructure developed under the NARIGP for the delivery of their services
- Counties were able to provide access to a new range of services to farmers registered under
- CIGs/VMGs could access essential equipment that is required for them to leverage digital technologies.

Through ongoing OMFP activities under the NAVCDP, services are there are currently being provided to nearly half a million farmers and there are 35 startups split between 4 tracks: Productivity, Market linkages, Financial inclusion and Data analytics.

Examples of DATs supported:

- Apollo Agriculture: focused on unlocking the potential of small-scale farmers with best-in-class inputs, financing, insurance, and training
- DigiCow: a mobile-based service delivery platform enabling vet service providers to digitize their work with farmers, allowing for data-driven decisions
- HelloTractor: provides technology IoT hardware and software for tractor owners to better manage their equipment, fuel, and operators while servicing smallholder farmers in need of mechanization services resulting in an increase in crop productivity.
- EzyAgric: one stop shop for agricultural inputs and services

Lessons learned and recommendations:

- County capacity was strengthened by recruiting and training County Digital Agricultural Leads (CDALs) for continuous oversight and implementation of DATs, and developing comprehensive capacity-building plans for FPOs/SACCOs.

- The creation of a geotagged farmer registry was essential in enabling county governments to connect DATs for CIGs, and to help the delivery of some customized services.
- The monitoring of the adoption and impact of these DATs must be strengthened as monitoring the reach only is not enough. Therefore, better frameworks for monitoring and evaluation are needed in the future.
- There is need to ensure the active involvement of women, youth, and marginalized groups in training and adoption of DATs.

At this stage, many smallholder farmers are still not showing any willingness to pay for these services. As such the provision relies on grants to the company for them to supply services. The sustainability of the model would require building a willingness to pay and ensuring projects are promoting affordable DAT solutions. A sustainable model for sustaining the supply of services to farmers through DATs might be needed. At this stage, the government is interested in the model of agripreneurs which could be a good conduit for the delivery of these services. But options can be identified around the world. For example, many countries are providing subsidies for registration fees for digital services. The services could also be procured by extension service officers for the supply of public services.

Box 3: Kamwamba Irrigation Project (KIP), Kiambu county

The Kamwamba Irrigation Project (KIP) is located in Chania and Mangu wards in Gatundu North sub-county in Kiambu county. Before the project, farmers were using watering cans and motor pumps to irrigate their farms using water from rivers and streams as there were no organized irrigation systems in the area. The main value chains in the area are bananas and vegetables. The objective of the irrigation project was to enhance banana productivity and profitability, and food security among beneficiaries. The project is currently covering 11 villages, sourcing water from the Githobokoni river, has an 84 ha target irrigation area, and 4,180 beneficiaries. Some of the main components of the project included the rehabilitation of an intake weir, construction of 26km Kamwamba irrigation pipeline covering 84 ha, the formation and capacity building of Irrigation Water Users Association (IWUA) and farmers, and the implementation of environmental management and monitoring plan. Some of the IWUA's sustainability measures include the implementation of a monthly user charge of Kes 200/farmer, continuous capacity building to improve on governance, and the promotion of banana value chain related TIMPs to improve banana market volumes.

The ICR mission team was given a tour of Mr. Peter's farm of bananas, local vegetables, and macadamia, and avocado trees. Before NARIGP, Mr. Peter's bananas were getting smaller especially during the dry season due to water stress. After NARIGP, he is now a lead farmer implementing some TIMPs, a direct beneficiary of the KIP, and a member of its IWUA. His banana production has increased from 20kg/stool/year to almost 100kg/stool/year, income from macadamia nuts has doubled, and his avocado fruit production has doubled to about 3000 fruits/tree. Mr. Peter is now employing 5-10 youths for harvesting and experiencing significantly lower post-harvest losses due to access to markets through a nearby NARIGP-funded banana aggregation center.

Similar to Mr. Peter, 95 percent of the 24,024 trained banana value chain beneficiaries adopted at least one TIMP. A comparison of productivity levels showed that the NARIGP wards attained an output of 66.7 kg/stool/year, a significant improvement from the baseline figure of 38.6 kg/stool/year. Control wards did not exhibit any productivity increase, with their production stagnating at 38.6 kg/stool/year. The variance of +28.1 kg/stool/year between NARIGP intervention areas and the control wards further demonstrates the impact of the project interventions on banana production.

Box 4: Limuru dairy farmers co-operative society, Kiambu

The Limuru dairy cooperative society was registered in 1962 and operations started in 1963 with 76 members, collecting 150 liters/day. Since then, the cooperative has had over 11,000 members. The society's goal is to transform members' lives by maximizing members' returns through enhanced milk production, processing, marketing of quality dairy products, animal feeds and vet services in collaboration with all stakeholders. The society is wholly owned by smallholder farmers and currently has almost 3,000 active members, with 42 milk collection points, and receives almost 35,000 liters/day (40,000 liters/day capacity).

In April, 2023, NARIGP underwent its fourth restructuring to address significant delays of funds flow to counties. One of the changes from the fourth restructuring was the inclusion of the Limuru dairy farmers cooperative society as a procurement entity. That unlocked implementation of the supply, delivery, installation, testing and commissioning of Ultra-Heat Treatment milk sterilization unit and extended shelf-life pouch packaging machine. The society now has four products: (i) fresh milk, (ii) yogurt, (iii) 3-day shelf-life milk, and (iv) 90-day extended shelf-life milk. Before NARIGP, farmers would receive 35 Kes/liter of milk. The society's members are now recording daily outputs of over 10 liters/day and receiving 48 Kes/liter. After the dairy's new machinery installation, the workforce increased from 121 to 183, with 53 percent females. The workforce and society members also have access to ongoing training for capacity building. Recently, delegates from seven African countries visited Limuru dairy to learn about its operations.

Overall, in NARIGP's implementing counties, 95 percent of the 71,468 trained beneficiaries in the dairy value chain adopted at least one TIMP. The intervention's impact on productivity is evident, with NARIGP wards recording a daily output of 9.2 liters (kg)/cow/day, more than doubling the baseline value of 4.4 liters (kg)/cow/day. There was no productivity improvement in the control wards, remaining at 4.4 liters (kg)/cow/day. Therefore, the project interventions significantly increased milk production and farmers' incomes.

Box 5: Young Observers Chicken Rearing Common Interest Group, Kisii county

The Young Observers CIG is located in the Bassi Chache ward in Kisii county. The group was formed in 2012 with the objective to breed chicks. The group currently has 15 members, with 46 percent females. Before the NARIGP project, the Young Observers CIG had a small incubator which could hold about 60 eggs. In 2019, a NARIGP grant enabled the group to purchase a new incubator with the capacity to hold 528 eggs. Since then, five members of the CIG have purchased their own incubators. Through NARIGP, the group has benefited from access to chicken rearing training and TIMPs. More than 66 percent of the group adopted improved feeds and disease management practices. The lead farmer of the group gave the ICR mission team a tour of her chicken sheds and shared how her capacity had increased by more than ten-fold (currently at 1000), income had increased due to increased sales and productivity, and how family diet had improved. The group is still facing some challenges such as water shortages, high cost of feeds, and market linkages. However, even with the challenges, the lead farmer and the other group members now have surplus income for building better homes and chicken sheds, school fees, and household items. The CIG members also now have increased access to chicken manure for their gardens.

Similar to the Young Observers CIG, there has been a strong uptake of advanced chicken production methods in the chicken value chain in the NARIGP implementing counties. Overall, 97 percent of the 194,639 trained beneficiaries adopted at least one TIMP. The NARIGP wards achieved a yield of 2067 kg/year, a significant increase from the baseline value of 64.8 kg/year and higher than the 509.87 kg/year recorded in the Control Wards. The variance of +1557.13 kg/year highlights the effectiveness of the interventions in significantly boosting chicken production.

Box 6: The Lanyuak Farmers Producer Organization, Narok County

Lanyuak is a Maa word for hard work. The Lanyuak FPO started as a self-help group in 2013. After sensitization and mobilization, Lanyuak transformed into a CIG and was enlisted into NARIGP in 2018. Their goal was to have access to clean and certified potato seeds and a structured market. Today, Lanyuak is a household name in the county and proof of how adopting TIMPs can increase farmer incomes. The group started by leasing a 14-acre piece of land on which they grew potatoes for demonstration. Through NARIGP's mobilization/inclusion grant, they recruited 56 CIGs who have since learned good potato practices and are members of the FPO. They were trained on various skills including motorized sprayers, crop management, use of motorized harvesters, utilization of diffused Live Stores (DLS) to reduce post-harvest losses, soil sampling and testing. Under NARIGP, FPOs were trained on the need for weighing produce, and the farmers trained on timing of seasons and marketing. After acquiring an enterprise development grant (EDG) of Ksh. 9.2 million from NARIGP, the Lanyuak FPO invested in a tractor and a plow and other high-quality inputs.

The FPO's seed potato production has further been boosted by the construction of 33 DLSs. As a result, Lanyuak has entered contract farming agreements with several private sector organizations certified by KEPHIS including Fresh Crop, Singles, and Agricultural Development Corporation (ADC). The farm-gate price of clean seed potatoes fetches between Ksh. 3000 - 3500 per 50-kg bag. This translates to Ksh. 600,000 - 700,000 per acre for a harvest of 200 x 50 kg bags per acre. For Lanyuak, hard work pays and NARIGP was the push that the farmers needed to enhance their potato production.

Box 7: Samburu Beekeepers Refinery, Samburu County

In Samburu, apiculture has become a game changer for income generation. Before NARIGP, beekeeping was perceived as a conservative way of livelihood and was not undertaken by many Samburu community members. The community has now changed its attitude towards honey and its products since the introduction of the enterprise by the NARIGP project. Beekeeping is now an economic enterprise into which both gender groups have ventured. To start with, NARIGP organized a Training of Training (ToT) at Baraka College. Farmers were then taken to Makueni for an exposure tour with 90 people from the county to benchmark and learn about beekeeping. Through NARIGP the Samburu Beekeepers Refinery (SBKR) has acquired centrifuge processing which has assisted in efficient honey refining. It refines 1.1 tonnes of honey worth Kes 1.4. million annually, since inception in 2020. It was estimated that so far, the SBKR has refined a conservative estimate of 4 tonnes of honey. The SBK has seen its membership rise from a low of 300 members to 1440, with a mobilization grant from NARIGP. Today, SBK has the capacity to make advanced langstroth beehives, has so far made 500 hives which were sold to farmers in Maralal ward and beyond.

Box 8: Kiminini Farmers SACCO, Trans Nzoia County

Following NARIGP's intervention, the Kiminini Farmers SACCO has become a beacon of hope for financial inclusion, for the smallholder farmers in the Kiminini ward. Initially, NARIGP gave grants to 47 Common Interest Groups (CIGs) in the ward. To ensure the sustainability of the investments from the grants, NARIGP through the Community Driven Development Committee (CDDC), supported the CIGs and VIMGs in the Ward to form a SACCO. NARIGP provided a KES 2,000,000 Financial Inclusion Matching Grant (FIMG) to the SACCO in addition to contributions from its members. Currently, the SACCO has 819 members who borrow at an interest rate of only 1 percent. The SACCO's capital base has also grown to KES 5,000,000, with loans amounting to KES 8,000,000 disbursed across various value chains. "We aspire to hit at least 1,000 fully registered members by the end of this year. With continued growth, we can provide even more support to our farmers and help transform the agricultural sector in Kiminini," said David Omar Juma, the head of the SACCO's Credit Committee.

ANNEX 7. SUPPORTING TABLES AND FIGURES

Table 1. Project Components

Components	Subcomponent	Cost At Appraisal (USD millions)	Cost at Closing (USD millions)
Component 1: Supporting Community-Driven Development	Subcomponent 1.1: Strengthening Community-Level Institutions Subcomponent 1.2: Supporting Community Investments	80	89
Component 2: Strengthening Producer Organizations and Value Chain Development	Subcomponent 2.1: Capacity Building of Producer Organizations Subcomponent 2.2: Value Chain Development	50	51
Component 3: Supporting County Community-Led Development	Subcomponent 3.1: Capacity Building of Counties Subcomponent 3.2: County Investment and Employment Programs	72	52
Component 4: Project Coordination and Management	Subcomponent 4.1: Project Coordination Subcomponent 4.2: Monitoring & Evaluation and ICT Subcomponent 4.3: Contingency Emergency Response	17	27
Total		**219.00**	**219.00**

Table 2. Summary of Key Changes Made via the Four Restructurings of NARIGP

Key Changes	Level 2 Restructuring			
	July 2017	Jan 2022	Jun 2022	Apr 2023
Change in Project's Development Objectives				
Change in Results Framework		√		
Change in Safeguards Policies Triggered				
Other Changes to Safeguards				
Change in Legal Covenants	√			
Change in Clients	√			
Change in Loan Closing Date		√		√
Reallocation between Disbursement Categories		√	√	
Change in Disbursement Estimates				
Change in Components and Costs		√		
Change in Financial Management				
Change in Procurement				√
Change in Implementation Schedule				
Other Changes				

Table 3. Yield increase in the selected priority agricultural value chains supported by the project

Value Chain	Unit	Yield		
		Baseline	**Endline**	**Percent Change**
Apiculture	Kgs/hive/year	11	15.6	41.8
Avocado	Kgs/tree/year	158.4	170.5	7.6
Bananas	Kgs/stool/year	38.6	62	60.6
Chicken	Kgs/month	5.4	7.8	44.5
Cotton	Kgs/acre/season	306.5	328.2	7.1
Dairy	Litres (Kgs)/cow/day	4.4	6	36.6
Green grams	Kgs/acre/season	123.9	139.9	13.0
Irish Potato	Kgs/acre/season	3,318.8	3,504.8	5.6
Leafy vegetables	Kgs/acre/season	279	847.7	203.8
Mangoes	Kgs/tree/season	256.3	288.2	12.5
Tomatoes	Kgs/acre	5,382.3	8,172.6	51.8
Overall Yield Change	**44.1**			

Table 4. Yield increases with project beneficiaries, compared to non-project households

Value Chain	**Project Households**					**Non-Project Households**			
	Unit of measure	**Baseline Values (2019)**	**Midline (2021)**	**Endline Values (2024)**	**Percent increase**	**Baseline Values (2019)**	**Midline (2021)**	**Endline Values (2024)**	**Percent increase**
		Source: MIS	Source: Survey	Source: MIS and EFA survey		Source: MIS	Source: Survey	Source: EFA survey	
Apiculture	Kgs/hive/ year	11	5.7	15.6	42	11	10.4	11.2	2
Banana	Kgs/stool/ year	38.6	54.6	62	61	38.6	49.6	38.6	0
Dairy	Litres/cow/ day	4.4	4.9	6	36	4.4	5.3	4.4	0
Green grams	Kgs/acre/ year	247.8	329.2	279.8	13	247.8	363.6	287	16
Chicken	Kgs/year	64.8	82.8	93.6	44	64.8			
Cotton	Kgs/acre/ season	306.5		328.2	7	306.5			
Irish Potato	Kgs/acre/ season	3318.8		3504.8	6	3318.8			
Avocado	Kgs/Tree/ Year	158.4		170.5	8	158.4			

Local Vegetables	Kgs/acre/ season	279		847.7	204	279			
Mangoes	Kgs/tree/ year	256.3		288.2	12	256.3			
Tomatoes	Kgs/acre/ year	5,382.30		8,172.60	52	5,382.30			

Table 5. Intermediate results indicators on Farmer Producer Organizations

Indicators	Results (Source: MIS)
FPOs received structured capacity building support (No.)	305
FPOs received inclusion grant (No.)	248
Increase in FPO membership compared to pre-project support (Number)	124,908
Increase in FPO membership compared to pre-project support (Percent)	37.9
Number of FPOs received enterprise development grant	98
FPOs received Value Chain Upgradation Matching Grant	77
Overall increase in aggregate turnover (Percent)	30
Number of FPOs reporting increased profitability	226
Percent of project supported FPOs reporting increased profitability (Percent)	74

Table 6. Transition of farmers from subsistence to commercial levels across value chains

Value Chain	Number of Beneficiaries	Stage	Subsistence (Percent)	Early Commercial (Percent)	Transitional (Percent)	Commercial (Percent)	Percent Change (Commercial)
Dairy	67,161	Baseline	75.8	12.9	8.4	2.9	**1.5**
		Endline	42.4	32.2	20.9	4.4	
Tomatoes	13,367	Baseline	82.6	5.3	4.4	7.6	**8.8**
		Endline	55.6	11.6	16.3	16.4	
Chicken	167,986	Baseline	82.9	4.7	8.0	4.4	**8.3**
		Endline	56.4	17.7	13.2	12.7	
Bananas	29,540	Baseline	98.6	0.2	0.8	0.4	**12.7**
		Endline	66.7	4.7	15.5	13.1	
Avocado	11,369	Baseline	92.8	1.4	4.0	1.8	**16.8**
		Endline	70.5	4.1	6.6	18.6	
Overall	370,354	Baseline	74.6	9.6	6.0	9.8	**8.5**
		Endline	47.7	20.0	14.0	18.3	

Source: EFA Survey

ANNEX 8. DATA SOURCES AND METHODOLOGIES

The quality of the data sources and methodologies used to evaluate the productivity and profitability outcomes is rated as Modest. Both qualitative and quantitative data from primary and secondary sources were used. The main data sources included:

- Review of project documents and reports
- Project Management and Information System (PMIS)
- Baseline household survey
- Endline household survey
- Key informant interviews
- Focus group discussions
- Interviews with service providers and other private sector institutions

A. HOUSEHOLD SURVEY, INTERVIEWS, AND FOCUS GROUP DISCUSSIONS

A structured questionnaire was administered to a sample of households by trained enumerators from ten wards. Semi-structured guides were used for the key informant interviews and focus group discussions with various project structures such as the NPCU, CPCU, County Project Steering Committees (CPSC), and CDDCs, as well as the beneficiary groups (primarily CIGs, VMGs, POs, and PFs). In addition, national structures (NPSC, NTAC, National Treasury (NT), and Council of Governors (CoG) were also consulted. Desk review and data mining from project documents was done to get data and information from various sources including the baseline survey report by the Tegemeo Institute, the Project Appraisal Document (PAD), Project Implementation Manual (PIM), Implementation Support Mission (ISMs) Aide-Memoires, and the Project Management Information System (PMIS) and progress reports.

Sampling: For quantitative household data collection, the same sample size which was used in the project's baseline study conducted by Tegemeo Institute was adopted to compare the project completion data against the initial targets. Through purposive sampling, five counties which were included in the baseline study were retained (Meru, Kitui, Kilifi, Muranga, and Bungoma) and five new counties which were not part of the baseline study (Samburu, Nakuru, Narok, Nyamira, and Homa Bay) were included. The households were spread proportionately across 10 project counties selected based on agroecological zones (AEZ) and priority value chains (Table 1). For instance, in Samburu county, the study targeted 36, 142, 13, and 226 respondents from the apiculture, chicken, dairy, and goat/sheep value chains respectively, resulting in a total of 417 respondents from the county.

Table 1. Sample counties and value chains for the household survey

Agroecological Zone	County	Prioritized Value Chains
Arid	Samburu	Apiculture, Chicken, Dairy, Goat/sheep meat
Semi-Arid	Meru	Avocado, Banana, Irish Potatoes, Macadamia
	Kitui	Apiculture, Chicken, Green grams, Mangoes
	Kilifi	Apiculture, Chicken, Coconut, Dairy
	Narok	Chicken, Dairy, Irish Potatoes
High Rainfall	Muranga	Avocado, Chicken, Dairy
	Nakuru	Apiculture, Chicken, Dairy, Irish Potatoes
	Bungoma	Banana, Beans, Chicken, Dairy
	Nyamira	Banana, Chicken, Dairy, Local Vegetables
	Homa Bay	Banana, Chicken, Cotton, Dairy

Table 2. Number of respondents per county for the household survey

VC / County	Apiculture	Avocado	Banana	Tomato	Beans	Chicken	Coconut	Cotton	Dairy	Goat/ sheep meat	Green grams	Irish potatoes	Indigenous vegetables	Macadamia	Mangoes	HHs
Samburu	36	0	0	0	0	142	0	0	13	226	0	0	0	0	0	417
Kilifi	16	0	0	0	0	187	17	0	15	0	0	0	0	0	0	235
Meru	0	19	17	0	0	0	0	0	32	0	156	0	0	83	0	307
Kitui	67	0	0	0	0	219	0	0	0	0	127	0	0	0	59	472
Nakuru	32	0	0	0	0	199	0	0	113	0	0	66	0	0	0	410
Muranga	0	33	46	0	0	107	0	0	76	0	0	0	0	0	0	263
Homa bay	0	0	96	0	0	109	0	30	41	0	0	0	0	0	0	276
Nyamira	0	0	0	0	113	354	0	0	142	0	0	0	170	0	0	779
Bungoma	0	0	44	0	95	121	0	0	101	0	0	0	0	0	0	360
Narok	2	0	0	28	0	170	0	0	102	7	0	0	0	0	0	309
TOTAL	**153**	**52**	**203**	**28**	**208**	**1608**	**17**	**30**	**635**	**233**	**283**	**66**	**170**	**83**	**59**	**3828**

Recruitment and training of enumerators: Data collection began with the training of 73 enumerators, selected by the CPCUs, and organized into two clusters. The training involved extensive interactive sessions between trainers and trainees and the clusters were formed proportionately based on the number of beneficiaries targeted and interviewed in each county. Each enumerator was required to interview at least five households per day. The data collection period was fixed at 10 days and each county was assigned one supervisor regardless of the number of enumerators. The enumerators were recruited from the agripreneurs working at the ward level and the supervisor was the County M&E officer familiar with the project and the local conditions in the county.

Data Collection and Quality Assurance: For quantitative data, the household survey tool was digitized and uploaded onto Android devices (phones or tablets) on which enumerators received training, which included peer testing and role plays, to ensure the tool functioned properly. All enumerators were proficient in its use. Two study team members were assigned to backstop the data collection process in select counties. Data was aggregated on a central server, where IT experts on the study team had daily access to information from all counties. They provided real-time support, monitored data quality, and addressed any discrepancies promptly. Qualitative data was collected through key informant

interviews and focus group discussions which were conducted at each county by the study team members. The number of focus groups and key informant interviews which were conducted are shown in Tables 3 and 4.

Table 3. Focus group discussions at the county level

Focus Group	#Per County	Participants	Total
Common Interest Groups (CIGs)	2	10	20
Vulnerable and Marginalized Groups (VMGs)	1	10	10
County Project Coordination Unity (CPCU)	1	10	10
Community-Driven Development Committee (CDDC)	2	10	20
Water Users Associations (WUA)	1	10	10

Table 4. Key informant interviews at county level

Key Informant	Per County	Total
Producer Organizations (POs) Leaders	2 x 10	20
SACCO Leaders	1X10	10
Service Providers	1x 10	10
County Technical Departments that supported the project	1 x 10	10
County Project Coordinator (CPC)	1 x 10	10

A. PRIMARY EFA SURVEY

Incremental benefits from the project were estimated for seven value chains (banana, green grams, mango, tomato, dairy, improved local chicken, and apiculture). To ensure robustness of the project's economic and financial performance indicators, the analysis used production data collected at baseline, periodic output data collected over the project period and tracked in the PMIS, and **a primary EFA survey of 1,400 NARIGP beneficiaries (200 per value chain) and 700 non-beneficiaries (100 per value chain)** sampled scientifically across eight project counties.

Samples of NARIGP beneficiaries were selected from at least three implementing counties per value chain and using probability proportional to size to choose the primary sampling units (CIGs), based on their total number in each county, and further stratified by county ward. From each selected CIG, up to five beneficiary households were randomly selected, covering at least four wards per county. The non-beneficiary (control) group was selected from CIGs in wards not included in the project.

Temporal analysis of the data allowed for observing trends and fluctuations in production for each value chain. Incremental gains were identified by comparing production at each time point with the baseline for the respective value chain. Overall benefits were calculated as the net increase in production from baseline to end-line, supplemented by cumulative gains during project implementation. The likelihood of incremental benefits building over the time needed for each value chain to reach full production potential and throughout the 20-year EFA evaluation period was projected based on average incremental changes observed between baseline and project completion.

Financial (market) input prices were collected during the primary EFA survey for all inputs used (e.g., seeds, fertilizers, labor, etc) and outputs (like crop yields or livestock products) sold in the product markets for each value chain. Farmers' self-reported input prices were verified and adjusted by comparing them with market data obtained directly from input suppliers across the counties where each value chain was implemented. Commodity prices were adjusted to farm-gate prices by comparing the prices reported by farmers with market prices from the Kenya Agricultural Market Information System (KAMIS) for the respective value chain products across participating counties.

C. CASE STUDIES

Knowledge management was an integral part of NARIGP. During its implementation, a rich harvest of new knowledge and learning emerged and the lessons learned were documented as case studies and incorporated into the project activities. These case studies present the NARIGP journey of what was done, what was achieved, how it was achieved and the lessons learnt[53]. They provide insights into the experiences during the project interventions, the beneficiaries reached, and the recommendations drawn from the results. To complement the case studies, video documentaries and selected success stories along the same thematic areas have been developed. The case studies focus on the following 14 thematic areas of the project:

1. Increased banana production impacts rural communities in Kenya
2. Making avocado sub-sector fetch more for Kenyan farmers
3. Making Kenyan farmers milk more benefits from the dairy sector
4. Revitalizing the coffee sector in Kenya
5. Revolutionising rural economies using indigenous chicken production
6. Building sustainable community institutions for agricultural transformation
7. Diversifying the resource base of vulnerable and marginalised communities in Kenya
8. Strengthening agricultural extension system in Kenya
9. Institutionalizing farmer producer organizations for agricultural transformation
10. Unlocking access to affordable credit in the rural using the SACCO model
11. Transforming agriculture through data-driven digital investments in Kenya
12. Increasing water accessibility for crop and livestock production
13. Creating youth employment through agriculture
14. Building farmers' resilience for sustainable agriculture and livelihoods

[53] There are additional NARIGP success stories on community transformation in 8 of the 21 implementing counties as well.

ANNEX 9. BORROWER, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS