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PROJECT PERFORMANCE ASSESSMENT REPORT

WHAT WORKS

KENYA

Agricultural Productivity Program

KAPP I AND II

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JANUARY 18, 2019

1818 H Street NW
Washington DC 20433
Telephone: 202-473-1000
Internet: www.worldbank.org

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PROJECT PERFORMANCE ASSESSMENT REPORT

REPUBLIC OF KENYA

KENYA AGRICULTURAL PRODUCTIVITY PROJECT
(C3929; CH098)

KENYA AGRICULTURAL PRODUCTIVITY AND AGRIBUSINESS PROJECT
(IDA-45920; TF-96460)

January 18, 2019

Independent Evaluation Group
Financial, Private Sector, and Sustainable Development

Currency Equivalents (annual averages, $1 in K Sh)

Currency Unit = Kenyan shilling

2004	$1.00	79.2 K Sh
2005	$1.00	75.3 K Sh
2006	$1.00	71.9 K Sh
2007	$1.00	67.2 K Sh
2008	$1.00	69.8 K Sh
2009	$1.00	77.2 K Sh
2010	$1.00	79.5 K Sh
2011	$1.00	88.7 K Sh
2012	$1.00	84.7 K Sh
2013	$1.00	86.4 K Sh
2014	$1.00	88.1 K Sh
2015	$1.00	89.7 K Sh
2016	$1.00	101.5 K Sh
2017	$1.00	103.4 K Sh
2018	$1.00	101.1 K Sh

Abbreviations

AIRC	Agricultural Information Resource Centre
APL	Adaptable Program Loan
ASDS	Agriculture Sector Development Strategy
BCR	benefit-cost ratio
CIG	common interest group
DSU	District Service Unit
ESMF	Environmental and Social Management Framework
FIRR	financial internal rate of return
ICC	Inter-Ministerial Coordination Committee
ICR	Implementation Completion and Results Report
ICRR	Implementation Completion and Results Review Report
ICT	information and communications technology
IDA	International Development Association
IEG	Independent Evaluation Group
KALRO	Kenya Agriculture and Livestock Research Organization
KAPAP	Kenya Agricultural Productivity and Agribusiness Project
KAPP	Kenya Agricultural Productivity Program
KAPSLM	Kenya Agricultural Productivity and Sustainable Land Management
KARI	Kenya Agriculture Research Institute

KENAFF	Kenya National Farmers Federation
M&E	monitoring and evaluation
MIS	management information system
NARS	National Agricultural Research System
NASEP	National Agricultural Sector Extension Policy
NGO	non-government organization
NPV	net present value
PPAR	Project Performance Assessment Report
RSU	Regional Service Unit
SRA	Strategy for Revitalizing Agriculture

All dollar amounts are U.S. dollars unless otherwise indicated.

Fiscal Year

Government: 1 July – 30 June

Director-General, Independent Evaluation	Ms. Alison Evans
Director, Financial, Private Sector, and Sustainable Development	Mr. José Carbajo Martinez
Manager, Sustainable Development	Ms. Midori Makino
Task Manager: Lead Evaluation Officer	Mr. Bekele A. Shiferaw

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This report was prepared by Bekele A. Shiferaw (Task Manager) with support from Songporne Tongruksawattana and local consultants, Jonathan Nzuma and Richard Mulwa, who helped assess the projects in July/August 2018. The report was peer reviewed by Steven Haggblade and panel reviewed by Jack van Holst Pellekaan. Vibhuti Narang Khanna provided administrative support.

Principal Ratings

Kenya Agricultural Productivity Project

Indicator	ICR*	ICR Review*	PPAR
Outcome	Moderately satisfactory	Moderately satisfactory	Moderately satisfactory
Risk to development outcome	Moderate	Significant	High
Bank performance	Moderately satisfactory	Moderately satisfactory	Moderately satisfactory
Borrower performance	Moderately satisfactory	Moderately satisfactory	Moderately satisfactory

Note: The Implementation Completion and Results Report (ICR) is a self-evaluation by the responsible Global Practice. The ICR Review is an intermediate Independent Evaluation Group product that seeks to independently validate the findings of the ICR. PPAR = Project Performance Assessment Report.

Kenya Agricultural Productivity and Agribusiness Project

Indicator	ICR*	ICR Review*	PPAR
Outcome	Moderately satisfactory	Moderately satisfactory	Moderately satisfactory
Risk to development outcome	Moderate	Substantial	High
Bank performance	Moderately unsatisfactory	Moderately unsatisfactory	Moderately unsatisfactory
Borrower performance	Moderately satisfactory	Moderately satisfactory	Moderately unsatisfactory

Key Staff Responsible

Kenya Agricultural Productivity Project

Management	Appraisal	Completion
Project Team Leader	Moctar Toure	Andrew Mwihia Karanja
Sector Manager or Practice Manager	Karen Mcconnell Brooks	Karen Mcconnell Brooks
Sector Director or Senior Global Practice Director		
Country Director	Makhtar Diop	Johannes Zutt

Kenya Agricultural Productivity and Agribusiness Project

Management	Appraisal	Completion
Project Team Leader	Andrew Mwihia Karanja	Ladisy Komba Chengula
Sector Manager or Practice Manager	Karen McConnell Brooks	Dina Umali-Deininger
Sector Director or Senior Global Practice Director		Juergen Voegele
Country Director	Johannes C.M. Zutt	Diarietou Gaye

IEG Mission: Improving World Bank Group development results through excellence in independent evaluation.

About This Report

The Independent Evaluation Group (IEG) assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the World Bank's self-evaluation process and to verify that the World Bank's work is producing the expected results, and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn from experience. As part of this work, IEG annually assesses 20–25 percent of the World Bank's lending operations through fieldwork. In selecting operations for assessment, preference is given to those that are innovative, large, or complex; those that are relevant to upcoming studies or country evaluations; those for which Executive Directors or World Bank management have requested assessments; and those that are likely to generate important lessons.

To prepare a Project Performance Assessment Report (PPAR), IEG staff examine project files and other documents, visit the borrowing country to discuss the operation with the government, and other in-country stakeholders, interview World Bank staff and other donor agency staff both at headquarters and in local offices as appropriate, and apply other evaluative methods as needed.

Each PPAR is subject to technical peer review, internal IEG panel review, and management approval. Once cleared internally, the PPAR is commented on by the responsible World Bank country management unit. The PPAR is also sent to the borrower for review. IEG incorporates both World Bank and borrower comments as appropriate, and the borrowers' comments are attached to the document that is sent to the World Bank's Board of Executive Directors. After an assessment report has been sent to the Board, it is disclosed to the public.

About the IEG Rating System for Public Sector Evaluations

IEG's use of multiple evaluation methods offers both rigor and a necessary level of flexibility to adapt to lending instrument, project design, or sectoral approach. IEG evaluators all apply the same basic method to arrive at their project ratings. Following is the definition and rating scale used for each evaluation criterion (additional information is available on the IEG website: http://ieg.worldbankgroup.org).

Outcome: The extent to which the operation's major relevant objectives were achieved, or are expected to be achieved, efficiently. The rating has three dimensions: relevance, efficacy, and efficiency. *Relevance* includes relevance of objectives and relevance of design. Relevance of objectives is the extent to which the project's objectives are consistent with the country's current development priorities and with current World Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, sector strategy papers, and operational policies). Relevance of design is the extent to which the project's design is consistent with the stated objectives. *Efficacy* is the extent to which the project's objectives were achieved, or are expected to be achieved, taking into account their relative importance. *Efficiency* is the extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared with alternatives. The efficiency dimension is not applied to development policy operations, which provide general budget support. *Possible ratings for outcome:* highly satisfactory, satisfactory, moderately satisfactory, moderately unsatisfactory, unsatisfactory, highly unsatisfactory.

Risk to Development Outcome: The risk, at the time of evaluation, that development outcomes (or expected outcomes) will not be maintained (or realized). *Possible ratings for risk to development outcome:* high, significant, moderate, negligible to low, and not evaluable.

Bank Performance: The extent to which services provided by the World Bank ensured quality at entry of the operation and supported effective implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of supported activities after loan or credit closing, toward the achievement of development outcomes). The rating has two dimensions: quality at entry and quality of supervision. *Possible ratings for Bank performance:* highly satisfactory, satisfactory, moderately satisfactory, moderately unsatisfactory, unsatisfactory, and highly unsatisfactory.

Borrower Performance: The extent to which the borrower (including the government and implementing agency or agencies) ensured quality of preparation and implementation, and complied with covenants and agreements, toward the achievement of development outcomes. The rating has two dimensions: government performance and implementing agency(ies) performance. *Possible ratings for borrower performance:* highly satisfactory, satisfactory, moderately satisfactory, moderately unsatisfactory, unsatisfactory, and highly unsatisfactory.

Preface

This is a Project Performance Assessment Report (PPAR) of phases I (P082396) and II (P109683) of the two-phase, 11-year *Kenya Agricultural Productivity Program* (KAPP). The second phase (KAPP II) is referred to as the Kenya Agricultural Productivity and Agribusiness Program (KAPAP). The projects were approved by the World Bank's Executive Board on June 17, 2004, and June 11, 2009, respectively. The estimated appraisal cost of the first phase was $70.37 million. The actual cost was $78.87 million, including $28.34 million of International Development Association (IDA) credit, a $13.7 million IDA grant, and $36.83 million of government finance. The estimated cost of the second phase at appraisal was $98.58 million. The actual cost was $70.31 million: $65.95 million of IDA credit; $3.79 million of government financing; and $0.57 million provided by the beneficiary communities.

This report was commissioned to assess the development results and outcomes of the projects, and to document the experiences and lessons from the innovative institutional and policy reforms carried out to accelerate agricultural productivity growth and commercialization of smallholder agriculture in Kenya. The sequential implementation of two projects offered an opportunity to assess the extent to which certain institutional and policy reforms—to bring pluralism in the agricultural extension system and increase the performance of the agricultural research system—have contributed to crop-livestock productivity growth. It also allows evaluation of whether the changes introduced are likely to be sustained.

The evaluation employed mixed approaches to generate evidence, including desk review of literature and project documentation (Implementation Completion and Results Reports, project appraisal documents, legal and project files, the midterm and end evaluation); interviews with World Bank and project staff and other stakeholders; data analysis; and field interviews of farmer beneficiaries. A summary of the data collection and analysis methods is provided in Appendix E.

The Independent Evaluation Group (IEG) thanks the World Bank management and staff and the KAPP management team in Kenya, as well as the many stakeholders interviewed for facilitating a highly collaborative and informative mission. Following standard IEG procedures, a copy of the draft PPAR was sent to relevant government officials and agencies for their review. The feedback summarized in Appendix M was considered in the finalization of this report.

Summary

This is a Project Performance Assessment Report (PPAR) of phases I and II of the two-phase, 11-year Adaptable Program Loan (APL) for the *Kenya Agricultural Productivity Program* (KAPP). A planned third phase of the APL did not materialize. The two projects in phases I and II were approved by the World Bank's Executive Board on June 17, 2004, and June 11, 2009, respectively.

Agriculture (including crops, livestock, and fish) is the key sector for economic growth and poverty reduction in Kenya. It plays a pivotal role in employment creation, food security, exports, and sustainable development. However, in the early 2000s the Kenyan economy and the agricultural sector were performing poorly, with declining productivity and competitiveness, and growing poverty and food insecurity. Multiple underlying factors were behind such poor performance: pervasive governance problems, weak infrastructure and economic services, domestic policy shortcomings, and legal and regulatory constraints.

The government of Kenya developed a new strategy to reverse those trends and revitalize the economy. The *Economic Recovery Strategy for Wealth and Employment Creation* (ERS; 2003–07) identified agriculture, trade and industry, and tourism as the key sectors to drive the recovery process and contribute to improving food security and reduce rural poverty. It was followed by launching the *Strategy for Revitalizing Agriculture* (SRA) to provide an enabling environment for increasing agricultural productivity, promoting investments, and encouraging private sector involvement in agriculture. The long-term objective of KAPP, as stated in the project appraisal document was to contribute to a sustainable increase in Kenya's agricultural productivity and improvement of the livelihoods of its rural communities." This overarching objective was expected to be achieved through improved performance of the agricultural technology supply and demand system by means of a phased APL with an initial design of 12 years, over three phases, which would be financed by a combination of credits and grants from the International Development Association. The two phases of KAPP, eventually implemented over 11 years, was the main support the World Bank provided to the agriculture sector in Kenya from 2004 through 2015.

KAPP I: Kenya Agricultural Productivity Project

KAPP I (2004–08) was designed to support the implementation of required policy and institutional reforms in the agricultural extension services and the national agricultural research system. The project had four components: (i) facilitation of policy and institutional reforms; (ii) support to extension system reform; (iii) support to research

system reform; and (iv) support to farmer/client empowerment. The objective of KAPP I, as stated in the Financing Agreement, was to "assist the Borrower in its efforts to increase agricultural productivity." It was expected to be achieved "through improvement of the systems supporting the development, dissemination and adoption of modern farming practices and technologies."

The relevance of KAPP I objectives is rated substantial. The objectives were relevant to support the SRA, which was important at the time of appraisal for revitalizing the stagnating agricultural sector. The objectives were well aligned with Kenya's Economic Recovery Strategy (2003–07) and targeted sustainable productivity growth in agriculture. The objectives were also consistent with the World Bank's 2004–07 Country Assistance Strategy.

The relevance of design of KAPP I is rated substantial. The design, including the project's components and theory of change, were generally well conceived and incorporated lessons and experiences from previous World Bank operations. It included plans to undertake a baseline survey and the regular monitoring of data to inform project management. The main deficiency of the design was the multiplicity of the proposed research activities and the lack of focus on a small number of priorities. In addition, the main objective was not clearly stated and the means to achieve it were complex and highly ambitious. Moreover, the project design had an ambitious plan to "establish a harmonized, sectorwide [monitoring and evaluation] M&E system," which did not materialize.

The efficacy of KAPP I is assessed to be substantial. The achievement of the main objective was measured using three project development objective (PDO) indicators. The first PDO indicator, establishing an integrated research and extension policy and institutional framework, achieved its target only for the extension policy dimension. The second PDO indicator, piloting of pluralistic extension approaches and supporting client empowerment, largely attained its target in terms of piloting of the extension approaches and farmer empowerment. Regarding the third PDO indicator, the adoption of improved dairy and maize technology for target farmers increased by 11 percent and 7 percent, respectively. Phase I also contributed to increasing fertilizer uptake across crops by about 5 percent during the project. Although the adoption targets were defined in aggregate and lacked details for expected enterprise-level technology uptake, the gross adoption indicator targets were met.

Efficiency of KAPP I is rated modest. A cost/benefit analysis and an efficiency analysis, similar to those carried out at project appraisal, were performed for selected enterprises when the project closed. The ICR estimated the economic and financial rates of return

and the net present value (NPV) based only on two enterprises (maize and potato). Despite the unrealistic assumption of a doubling of crop yields over the national crop area, the estimated economic rates of return were significant: 25 percent for maize and 37 percent for potato. However, the sensitivity analysis showed that efficiency over the long term will be low, unless yields double and adoption is widespread.

The overall outcome for KAPP I is assessed as moderately satisfactory. With a **modest** rating for efficiency and **substantial** ratings for relevance and efficacy, there were moderate shortcomings in the achievement of project objectives.

Risk to development outcomes is rated high. Following the substantial devolution of power and resources from the national government to newly established county administrations in 2010, both local ownership and the capacity to implement the National Agricultural Sector Extension Policy at the county level—to revitalize the agricultural extension system—were significantly eroded. The counties may need to carefully adapt to and tailor national policies introduced by the devolution, and several of the institutional changes (such as farmer cooperatives and contracted private service delivery systems) and development outcomes initiated through KAPP I face the high risks of not being maintained nor sustained, as explained under KAPP II.

Bank performance is rated moderately satisfactory. Bank performance in ensuring quality at entry was **moderately unsatisfactory**. Project progress was adversely affected by inadequate implementation arrangements and the weak financial management system that persisted throughout phase I. The World Bank overestimated the financial management strength of the Kenya Agriculture Research Institute (KARI) to implement a complex and multiagency project, and underestimated the time needed to build implementation capacity. Bank supervision was **moderately satisfactory**. The project benefited from continuous interaction with the World Bank project task team based in Kenya. The supervision missions identified bottlenecks and effectively provided proposed solutions.

Borrower performance was moderately satisfactory. The government of Kenya maintained strong commitment for the project and, therefore, their performance in this project is rated **satisfactory**. The performance of the implementing agencies was **moderately unsatisfactory**. KARI was responsible for fiduciary matters and took time to coordinate effectively and to implement the World Bank–recommended financial monitoring report system, which caused excessive delays in disbursements and delayed implementation. KARI was also unable to complete an inventory of available technologies and data system and did not establish the envisaged sustainable funding mechanism to reduce external dependence. The KAPP Secretariat at the national level

and the District Service Units at the local level also faced challenges in timely disbursement of funds.

KAPP II: Kenya Agricultural Productivity and Agribusiness Project (KAPAP)

KAPAP (2009–15) was financed through the second phase of the APL, with a focus on productivity growth while embracing diversification, value addition, market linkages, and partnerships. It aimed to consolidate and scale up the gains from KAPP I and address some remaining issues, including reforming the research system and expanding technology development and diffusion and agribusiness opportunities. KAPAP's development objective was to "increase agricultural productivity and the incomes of participating smallholder farmers in the Project areas." This was planned to be implemented through four components, three of which continued from phase I: (i) support for sectorwide approaches and policies (component 1), (ii) support for agricultural research systems (component 2), (iii) support for agricultural extension and farmer empowerment (component 3), and (iv) support for agribusiness and market development (component 4).

KAPAP was implemented at a time of profound transition in Kenya involving major national governance reforms, including a new constitution (introduced in 2010) and commencement of a decentralized and devolved system of government in Kenya. These changes shaped the implementation process of the project, its achievements, and the sustainability of its outcomes.

The relevance of objectives of KAPAP is rated substantial. KAPAP was a continuation of the World Bank's long-term response to support the SRA and the need to ensure food security in Kenya. At appraisal, the objectives were highly relevant and aligned with the government of Kenya's priorities. The objectives also remained well aligned with the World Bank's 2004 Country Assistance Strategy for Kenya, the SRA, and the updated sector strategy (2010–20), the Agricultural Sector Development Strategy (ASDS). At completion, the project's objective continued to be substantially relevant to the government priorities and the implementation of the ASDS.

The relevance of design of KAPAP is rated modest. The underlying logic and theory of change that tie the project's four components to the outputs and expected outcomes was not presented in the results framework. The design was complex but appropriately ambitious, especially for the first and forth components. Some of the component 1 activities targeting complex institutional reforms, including changes in policies, strategies, and laws, were certainly ambitious but also relevant. Component 4 also featured complex private sector activities for which there was no prior experience and

capacity. The project design also lacked a sound financial management system with sufficient internal controls to overcome the challenges faced in phase I.

The efficacy of the first objective is assessed to be substantial. The first objective (increase agricultural productivity of participating smallholder farmers) was largely achieved. Regarding research, the project funded eight competitive grant projects, supported the legal framework leading to formal establishment of the Kenya Agriculture and Livestock Research Organization (KALRO) in 2013, and developed agricultural technologies. However, the envisaged Agricultural Research Fund was not established. KAPAP also supported 223,971 smallholder farmers organized into 6,401 common interest groups. But the envisioned sustainable financing mechanism for agricultural extension service delivery was not developed because the regulatory frameworks and quality standards for contracted private extension services were not established. Consequently, the intended demand-driven private extension mechanism did not materialize. There is evidence, however, of productivity gains in target areas. Independent Evaluation Group (IEG) analysis indicates that compared with the 2011 baseline, yields for participating farmers increased by 19 percent for honey, 33 percent for sweet potatoes, and 22 percent for cow milk.

The efficacy of the second objective is rated modest. The second objective (increase the incomes of participating smallholder farmers in the project area) was not achieved. About half of the value chains supported were unprofitable or unsustainable. Only two of the five planned projects for linking rural agro-processing activities to off-grid energy materialized. The IEG field study indicated that only about a third of the cooperatives were active and two-thirds have gone dormant after project closing. Similarly, about 60 percent of the common interest groups were inactive. Available evidence also suggested that men and women farmers were unable to reach the target to increase their gross sales revenues by 35 percent and 45 percent, respectively.

Efficiency of KAPAP is rated substantial, with shortcomings. At closing, the financial internal rate of return (FIRR) and NPV for eight commodities were re-estimated at 38 percent and $59.5 million, respectively. The project was unable to absorb about $16.09 million, which was eventually cancelled. Financial management was weak and project effectiveness was delayed because of unresolved phase I financial issues. Implementation progress was slow and ran behind schedule.

The overall outcome for KAPAP is assessed as moderately satisfactory. Relevance of objectives was rated **substantial** and relevance of design was rated **modest**. Efficacy of the first subobjectives was rated **substantial** but the efficacy of the second subobjective was rated **modest.** Efficiency was rated **substantial** despite weaknesses in

administrative and institutional efficiency. Overall, there were moderate shortcomings in the achievement of the project's objectives.

Risk to development outcomes is rated high. KAPAP outcomes face high risks regarding sustainability. After supporting reforms for revitalizing extension in two phases, there is a widespread concern among experts and stakeholders that the performance of public extension systems has declined further. In addition, the private extension and service delivery systems piloted through the project failed to be established, except for some high value enterprises, leaving a huge gap in the coverage of the extension service. With few exceptions, the county governments have not prioritized agriculture and did not fully implement reforms to revitalize the extension system. Over two-thirds of the farmer cooperatives and 60 percent of the common interest groups have been unable to sustain their activities. Without significant additional support from the counties, the sustainability of these rural institutions and service delivery models is highly questionable.

Bank performance is rated moderately unsatisfactory. Quality at entry is rated **moderately unsatisfactory**. The project's design benefited from the experience and lessons of the first phase. However, despite its innovative aspects, the fourth component lacked critical analytical work to support the ambitious design. The weakness in financial management persisted during phase II. Quality of supervision is rated **moderately unsatisfactory.** Although regular supervision produced action plans, it was not able to prevent cancelation of significant funding and dropping of activities late into the project or weak M&E implementation and ineligible financial expenditures.

Borrower performance was moderately unsatisfactory. Government performance is rated **moderately unsatisfactory.** As in phase I, the government provided strong support, as evidenced by adoption of a series of policy reforms for revitalizing agriculture. However, the level of support to implement the reforms diminished following the devolution to county administrations. The county governments (with some exceptions) have not shown strong commitment to provide support to revitalize extension and improve productivity of smallholder agriculture. The government of Kenya was also slow in resolving issues that delayed project effectiveness and the complex treasury procedures, leading to cancelation of $16.09 million of project funds. Implementing agency performance is rated **moderately unsatisfactory.** Internal capacity weaknesses in project and financial management persisted throughout implementation. Despite the project having a full time M&E specialist, the M&E system failed to track essential performance indicators and the impact evaluation was methodologically flawed and did not build on the useful baseline.

Lessons

The following lessons are drawn from the experience of the KAPP program:

Sustained government ownership and commitment are key to achieve complex and sectorwide institutional reforms. KAPP sought to improve sector performance by undertaking complex policy and institutional reforms in research and extension along with changes in the underlying legal and regulatory frameworks. KAPP was a pioneer in the effort to revitalize the largely ineffective and public sector–dominated research and extension systems through reforms to introduce demand-driven and pluralistic approaches. Despite the challenges of sectorwide coordination and fundamental changes in sector governance, sustained government ownership and commitment to improving the efficiency of the agricultural sector can result in substantive reforms in the national agricultural research and extension systems.

Effectiveness of institutional reforms and project outcomes requires sustained effort through continuous realignment with the changing context. KAPP supported significant policy and institutional reforms, but it faced challenges in sustaining the implementation of these reforms through the devolution of power and resources to county administrations. While the devolution provided significant powers and responsibilities for the agricultural sector to the counties and enhanced local ownership, the lack of local capacity, unclear priorities for agriculture, and weak coordination and alignment with the new setting affected implementation and effectiveness of the extension reforms, including the sustainability of the cooperatives and farmer common interest groups. The long-term effectiveness of institutional reforms depends on sustained effort, capacity building, and continuous realignment to new conditions.

Participatory and client-driven approaches with strong priority setting and regular evaluation are critical to stimulate and transform the agricultural research system. A conclusion from this project is that considerable effort is needed to make agricultural research more responsive, demand driven, inclusive, and effective in developing technologies and stimulating uptake by its clients. KAPP resources were used to support a wide range of core and new research initiatives but it led to fragmentation of effort and the proliferation of small-scale activities. Agricultural research can benefit from a mechanism that clearly articulates priorities from the demand side, as a basis for research planning, and from effective instruments that connect research with extension.

Provision of agricultural extension services to poor small-scale farmers as a public good requires a sustainable financing mechanism. The public good characteristics of agricultural research and extension in Kenya continue to offer the rationale for public

sector participation in both. KAPP's approach was to introduce pluralism into the extension system by supporting public funding of a private sector fee-for-service delivery model. The public sector played a leading role when the private sector lacked an incentive to provide extension services to poor farmers unable to pay for such services. This model worked well when project financing was available, but it was not sustained after the project closed. Public funding complemented by cost sharing with farmers tied to marketing of surplus produce—through cooperatives or farmer groups—may contribute to bolstering funding arrangements for agricultural extension to poor small-scale farmers.

Public sector funding for extension services can be decoupled from public provision to strengthen complementarities and create space for private sector participation and improved service delivery. KAPP piloted the contracting of private providers using farmer grants and demonstrated that the public sector can engage and deliver extension services using private providers. This is more justified in areas where the private sector lacks the motivation to deliver such paid services without public support. Public funding can be decoupled from public provision to provide contracted services to small-scale farmers, which creates space for a more efficient delivery of services using the private sector and contributes to strengthening complementarities between the public and private extension systems.

Scaling up the contracted service delivery model using the privatized extension system requires development of new public regulatory and quality control systems. The KAPP experience shows that contracted extension service delivery by private fee-for-service extension is viable for market-oriented high value products (such as dairy) where farmers' net benefits are higher than the cost of accessing such services. However, it was not possible to scale up this model without the development of new public regulatory systems that ensure high quality technical content of private fee-for-service extension.

José Carbajo Martínez
Director
Financial, Private Sector and
Sustainable Development Department

1. Background and Context

Country Background

1.1 Kenya occupies an area of half a million square kilometers in East Africa, of which nearly half is used for agriculture. The Kenyan Highlands comprise one of the most suitable agricultural production regions in Africa. In recent years, Kenya has made significant structural and economic reforms in the agricultural sector that have contributed to its sustained economic growth and social development.

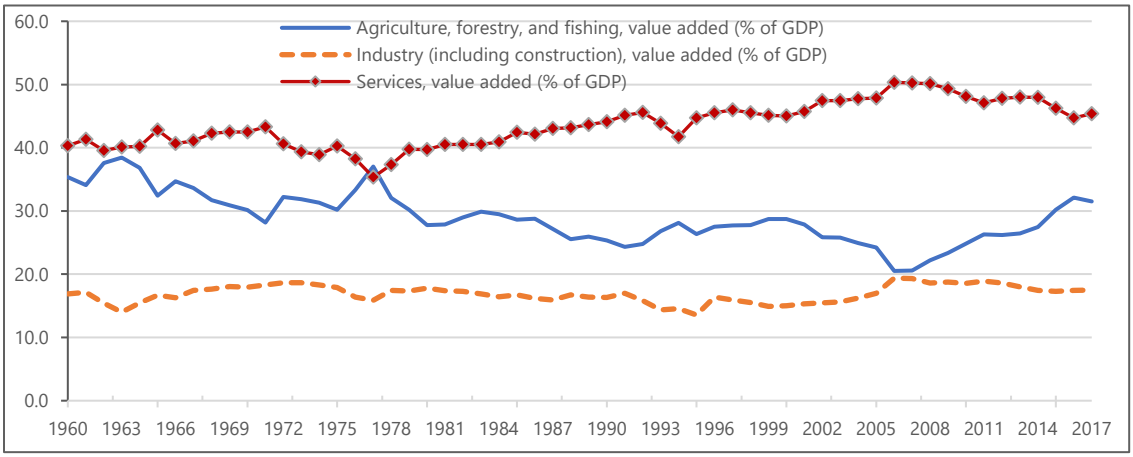
1.2 Following its independence in 1963, Kenya was a de facto one-party state for many years and suffered from poor economic performance and weak institutions. In December 2002, Kenya turned a historical page, ending the political domination of one party and electing a new president through competitive elections. This followed a campaign to eliminate corruption and restore the rule of law and improve governance, along with new strategies for economic and social development and a public sector strategy. However, the disputed outcome of the subsequent presidential elections in 2007–08 flamed violence and political instability, which, together with drought, high global food and fuel prices, and the global financial crisis, negatively affected economic growth. In August 2010, Kenya adopted a new constitution that put additional checks and balances on executive power and eliminated the position of prime minister, leading to a presidential election in March 2013. The new institutional landscape also paved the way for a devolution of centralized powers from the national government, including 30 percent of government revenues, to the 47 new county administrations. The devolution is expected to improve political and economic governance, engender greater citizen engagement and oversight, and strengthen accountability and delivery of policy priorities at local levels.

1.3 Kenya benefits from its strategic position as the economic, social, and transport hub of East Africa and its relatively large and diversified economy. However, the country continues to battle key development challenges of poverty, inequality, governance, climate change, low investment, low firm-level productivity, and the vulnerability of the economy to internal and external shocks (World Bank 2018a). During the post adjustment period that triggered the economic reform process in the early 2000s, Kenya's economy had been performing considerably below its potential; gross domestic product (GDP) growth declined from about 7 percent in the 1970s to just over 2 percent in the 1990s. The new constitution was associated with a recovery in growth to its peak at 8.4 percent in 2010 but it has since been drifting around 5 percent (World Bank 2018b). Kenya's average per capita income of $1,508 in 2017 (World Bank 2018c) placed it in the lower-middle-income country category (World Bank 2018d). The incidence of poverty based on the recent Kenya Economic Survey was 36.1 percent in 2015/16, with the highest poverty incidence (40.1 percent) in rural areas (KNBS 2018).

This indicates that about 16.4 million people (out of the 45.4 million total) at the national level and 11.7 million people in rural areas lived under the poverty line in 2015/16. [1]

1.4 Agriculture is the anchor of economic growth and poverty reduction in Kenya. It plays a vital role in employment, food security, and foreign exchange earnings and in environmental protection and sustainable development.[2] Growth of the national economy is highly correlated to growth and development in agriculture, contributing 31 percent of GDP in 2017. Although its share in GDP declined after 1977, agriculture's contribution to GDP showed an upswing from 20.5 percent in 2007 to 31.5 percent in 2017 (Figure 1.1). More than 40 percent of the total population and 70 percent of Kenya's rural people are employed in agriculture-related activities, contributing to 61 percent of the total employment. Existing studies indicate that growth in the agriculture sector in Africa is more effective, compared with similar growth in other sectors, in reducing poverty (Christiaensen, Demery, and Kuhl 2011).

Figure 1.1: Structure of the Kenyan Economy



Source: World Bank, World Development Indicators.

Project Context

1.5 During the 1990s annual growth of the agricultural sector had declined to 1 percent, leading to increased rural poverty and food insecurity, reduced competitiveness, and stagnation in private and public investment in the agricultural sector. To revitalize the economy and the agricultural sector, the government of Kenya issued a new development strategy, the Economic Recovery Strategy for Wealth and Employment Creation (ERS 2003–07), which identified agriculture, trade, industry, and tourism as the prime instruments of the recovery program and emphasized sustainable agricultural growth as a critical element for job creation, food security, and poverty reduction (Government of Kenya 2003). This blueprint marked the unprecedented priority to revitalize the agricultural sector as the most important economic activity and livelihood for the poor in the rural areas.

1.6 In 2004, the government of Kenya submitted the *Investment Program for the Economic Recovery Strategy* (IP-ERS) as a poverty reduction strategy paper to the International Monetary Fund and World Bank, who approved funding to implement the Economic Recovery Strategy (World Bank 2004a). The three pillars of IP-ERS included strengthening economic growth, enhancing equity and reducing poverty, and improving governance. To improve equity and reduce poverty, IP-ERS prioritized expansion of productive capacity in agriculture and development of arid and semiarid lands, alongside universal primary education, improved access to public health, and upgrading living conditions of the poor.

1.7 In tandem with the Economic Recovery Strategy, the government of Kenya also developed in 2004 the *Strategy for Revitalizing Agriculture* (SRA) to provide a conducive policy and institutional environment for increasing agricultural productivity and encouraging private sector investments in the recovery process. The SRA aimed to achieve the government's vision, "to transform Kenya's agriculture into a profitable, commercially-oriented and internationally and regionally competitive economic activity that provides high-quality, gainful employment to Kenyans" through improved agricultural productivity and farm incomes, while conserving natural resources and the environment (Government of Kenya 2010). This vision reflected a paradigm shift in the government's policy to transform agriculture from subsistence to commercial profit-oriented business.

1.8 The government approached the World Bank for technical assistance and financing to support the implementation of the SRA. An agreement was reached to launch the Kenya Agricultural Productivity Program (KAPP) over 12 years in three phases (of three, four, and five years) through the Adaptable Program Loans (APL) instrument, combining credits and grants from the International Development Agency. With the extension of phase I, the interval was later revised in 2009 to four, five, and three years.

However, the APL was implemented only in two phases (third phase cancelled):

- Phase I: Kenya Agricultural Productivity Project (KAPP I): 2004–08
- Phase II: Kenya Agricultural Productivity and Agribusiness Project (KAPAP): 2009–15

1.9 Like many countries in the region, the public extension services in Kenya have been ineffective in terms of improving access to key services, including productivity-enhancing technologies, markets, and agribusiness development.[3] KAPP was therefore designed to support sectorwide reforms and innovative approaches to enhance the effectiveness of agricultural extension and agribusiness through demand-driven and private-sector-led service delivery systems.

1.10 KAPP was a pioneer in the region in terms of revitalizing and diversifying the public-sector-dominated extension system by bringing in private sector service

providers. In addition to enhancing development effectiveness and accountability, the experience and the sustainability of alternative approaches piloted and supported through KAPP (for example, support to contracted extension services) therefore warrant an in-depth independent assessment. The Independent Evaluation Group (IEG) Implementation Completion Report Reviews (ICRRs) also recommended an additional assessment for both projects to verify the ratings and review the lessons for similar World Bank projects (World Bank 2010a, World Bank 2017). IEG thus prepared this Project Performance Assessment Report (PPAR) to assess KAPP I and KAPAP in the interest of supporting the World Bank's long-term engagement in raising agricultural productivity and poverty reduction in Sub-Saharan Africa.

2. Kenya Agricultural Productivity Program (KAPP)

2.1 KAPP was conceived to support the implementation of the SRA through substantive policy and institutional reforms for modernizing agricultural research and extension and to contribute to agricultural productivity growth. The long-term objective of the three-phase program, as stated on page 2 of the project appraisal document (PAD) for the first phase, was to "contribute to sustainable increase of Kenya's agricultural productivity and improvement of the livelihoods of its rural communities through the improved performance of the agricultural technology supply and demand system"(World Bank 2004b).

2.2 The KAPP Financing Agreement approved by the World Bank in June 2004 stated that the project development objective (PDO) for KAPP I was "to assist the Borrower in its efforts to increase agricultural productivity." The financing agreement went on to state that the objective would be achieved "through improvement of the systems supporting the development, dissemination and adoption of modern farming practices and technologies" (World Bank 2004c). As a result of several delays in the release of funding, KAPP I came to a close in December 2008, one year later than the original closing date.

2.3 The second phase of the program, the Kenya Agricultural Productivity and Agribusiness Project (KAPAP) was approved in June 2009. The PDO for KAPAP as stated in the Financing Agreement was "to increase agricultural productivity and the incomes of participating smallholder farmers in the Project area" (World Bank 2009c). Through this second phase, the World Bank aimed to support the government of Kenya to consolidate and scale up the gains from KAPP I, and address the remaining issues in technology development and diffusion, implementation of reforms in extension, and expansion of emerging opportunities in agribusiness. KAPAP continued to focus on productivity growth while embracing diversification, value addition, market linkages, and promotion of public-private partnerships in service delivery and agribusiness development. This project was restructured twice, in November 2011 and September

2015, both level 2 restructurings. KAPAP came to a close in September 2015 after a nine-month extension. See overview of the program in box 2.

2.4 During these two phases of implementation, KAPP was the main form of World Bank support to the agriculture sector in Kenya, with a revolutionary vision to transform the subsistence-oriented smallholder agriculture toward agribusiness and to engage private service providers in the agricultural extension and service delivery system. The structure of an APL allows the project to proceed sequentially, with triggers for each phase. However, although all conditions set in the triggers were fully met, the planned third and final phase of the program did not materialize (Government of Kenya 2015a). After 11 years of program operation over two phases, the World Bank decided not to continue with the third phase as there was only one year remaining under the APL instrument. The focus instead shifted to a more flexible financing arrangement in two new projects that built on experiences and target areas of KAPP: (i) National Agricultural and Rural Inclusive Growth Project for Kenya (approved in 2016); and (ii) Kenya Climate Smart Agriculture Project (approved in 2017).

Beneficiaries and Targeting

2.5 The target population of the program was the smallholders and subsistence farmers of Kenya in rural areas. Twenty districts, each containing two divisions, were selected for project implementation in phase I. Phase II redefined the target areas and subdivided the original 20 districts into 59 districts for the project (see appendix B for project areas).

2.6 The primary beneficiaries of KAPP were the farmers participating in self-defined common interest groups (CIGs) in 80 divisions of 20 pilot districts (four divisions per pilot district). 1,350 CIGs (with a total estimated membership of about 100,000 farmers) were expected to benefit from (i) group facilitation in priority settings, (ii) support in development of enterprise development plans, (iii) contacts with contracted service providers, and, where they qualified, (iv) matching grants to fund business plans. In addition, the secondary beneficiaries included (i) the staff of the Ministries of Agriculture, Livestock Development, and Fisheries Development and Kenya Agriculture Research Institute (KARI)/Kenya Agricultural & Livestock Research Organization (KALRO) at the national and local levels (including at District Service Unit (DSU) and at KARI/KALRO centers in the field); and (ii) private and public service providers, producer organizations (commodity organizations, farmers forums, and cooperatives) and NGOs involved in project activities.[4]

2.7 During phase II, KAPAP aimed to cover 59 districts, 236 divisions (an average of four divisions per district), 472 locations (two locations per division) and about 7,080 CIGs (15 CIGs per location). KAPAP also aimed to empower public and private stakeholders along commodity value chains including strengthening the cooperative

movement of CIGs. The total number of primary beneficiaries was estimated at about 400,000 women and men. However, when this target was formally introduced, and following project restructuring that took place at midterm review in June 2013, this target was reduced to 200,000 beneficiaries. Secondary beneficiaries were redefined to include public and private research communities, private extension service providers, and farmers' apex organizations, especially the Kenya National Federation of Agricultural Producers (KENFAP) which later became Kenya National Farmers Federation (KENAFF). Other secondary beneficiaries included agricultural input suppliers and agricultural produce traders.

Financing

2.8 In both phases, the project costs were financed by a combination of IDA credits and a contribution from the government of Kenya (the borrower). Furthermore, KAPP I received IDA grants earmarked for the poorest countries, and KAPAP included direct contributions from farmers. The latter refers to their monetary share capital in cooperatives without accounting for their contribution of material and labor.

2.9 KAPP I estimated project costs at appraisal were $70.37 million over three years (2004–07), including $27 million in IDA credit, $13 million in IDA grants for the poorest countries, and $30.37 million of government financing. On account of the depreciation of the U.S. dollar against the SDR during the project period, the actual cost at closure was estimated at $78.87 million, including $28.34 million in IDA credit, $13.7 million in IDA grants for the poorest countries, and $36.83 million of borrower finance. There was also some reallocation of funds following the midterm review in 2006, leading to a 12-month extension to make up for the lost time.[5] The funds were reallocated to increase funding for avian flu prevention, capacity building of farmer cooperatives and training of CIGs and service providers, and operating costs of DSUs. Although all the IDA funds were utilized, only about 74 percent of KAPP I resources were disbursed at the time of closing (December 31, 2008). For details on KAPP I project financing, see table A.1 in appendix A.

2.10 At appraisal, the total project costs of KAPAP were estimated at $98.58 million over five years (2009–14), including $82 million in IDA credit, $14.13 million in government financing, and $2.45 million in cofinancing by the beneficiary communities. The estimated actual costs for KAPAP were $70.31 million, including $65.95 million of IDA credit, $3.79 million of borrower financing, and $0.57 million provided by the beneficiary communities. About 80 percent of IDA funds were utilized. Although about 45 percent of credits was disbursed by 2013, the midterm review in June 2013 rated the project implementation progress as **moderately unsatisfactory** and proposed a credit cancellation of at least $17 million and a reallocation of the remaining amount to focus on activities that could be used within the remaining implementation period. As a result, $16.095 million was cancelled from the original credit amount, which reduced the IDA

credit to $65.95 million. For details on KAPAP project financing, see table A.7 in appendix A.

Table 2.1: Project Costs by Component

Phase	Component	Estimated *($ million)*	Actual *($ million)*
KAPP I[a]	Facilitation of policy and institutional reforms	7.90	4.87
	Support to extension system reform	3.46	4.66
	support to research system reform	53.70	64.71
	Support to farmer/client empowerment	5.31	4.63
	Total	70.37	78.87
KAPP II[b]	Policy/institutional and project implementation	8.06	15.06
	Agricultural research systems	22.83	19.27
	Agricultural extension, farmer and other stakeholder empowerment	29.38	20.26
	Agribusiness and market development	21.73	11.36
	Total	82.00	65.95

[a)] KAPP I component costs include borrower contribution of $30.37 million at appraisal and $36.83 million actual.
[b)] KAPP II (KAPAP) component costs only include International Development Association (IDA) credit financing. The borrower contributions are not specified for each component but there was a borrower contribution of $16.58 million at appraisal which became $4.36 million in actual terms (World Bank 2004b). At the midterm review in June 2013, $16.095 million was cancelled from the original credit amount, which reduced the credit to $65.95 million.
Sources: World Bank (2010a; 2017).

2.11 The largest share of financing from IDA credit (table 2.1) for KAPP I was allocated to support the research system reform component, accounting for 82 percent at the time of project closing. On the other hand, KAPAP concentrated its financing to support about 30 percent each of the agricultural research systems component and the component called "agricultural extension, farmer and other stakeholder empowerment." The midterm restructuring in 2013 significantly scaled down the operation of the agribusiness and market development component from $21.73 million at appraisal to $11.36 million at closing.

Program Implementation Arrangements

2.12 As described in the PADs (World Bank 2004b; 2009b), the implementation of KAPP I and KAPAP followed a sectorwide approach under the framework of the Kenyan government's SRA and received coordination and policy guidance from organs already set up by the government, such as the SRA-Inter-ministerial Coordinating Committee (SRA-ICC) and Agricultural Sector Coordination Unit (ASCU). In both phases, overall coordination and fiduciary responsibility for the projects was assigned to the Ministry of Agriculture which was accountable for the project funds.[6] To oversee project implementation in phase I, the SRA-ICC appointed a KAPP Steering Committee (KSC).[7] In phase II, the membership of the KSC expanded to form a broad-based Agricultural Sector Programs Steering Committee (ASPSC) that became responsible for

coordinating all programs and projects in the agricultural sector, rather than having stand-alone steering committees for each project/program.[8,9] The KAPP Secretariat[10] acted as Secretary to the ASPSC for KAPAP specific matters, and the ASCU offered the Secretariat of ASPSC assistance on general sector matters and programs.

2.13 The implementation of KAPP was mainstreamed into the government system, at national, district, and lower levels. In keeping with the PAD, KAPP I was designed to be implemented by three agencies, the Ministry of Agriculture, the Ministry of Livestock Development and Fisheries, and KARI.[11] Overall coordination of the implementation was assumed by the KAPP Secretariat. Responsibility for implementation of the National Agricultural Research System (NARS) component and all non-KARI components formally remained with the secretariat, but KARI retained the ultimate responsibility for financial management and procurement in both KARI and non-KARI components.[12] However, the implementation in the districts was the responsibility of 20 DSUs[13] that undertook the district-delegated functions of the secretariat. Although agriculture line ministries had overall responsibility for project oversight through the ICC, KARI was responsible for fiduciary matters, which was later passed on to the secretariat at the central level, and to the DSUs at the district and local levels (World Bank 2009a).

2.14 The implementation of KAPP phase II continued to be mainstreamed into the government system at national and lower levels. The DSUs, however, were converted to Regional Service Units (RSUs) and the implementation of project activities was extended to six ministries/agencies within their respective areas of responsibility.[14] All transfer of project funds and payments was made through the KAPP Secretariat, and the secretariat and RSUs took full responsibility for accounting for project funds.

3. KAPP I: Kenya Agricultural Productivity Project

Relevance of the Objectives and Design

Objectives

3.1 The PDO in the Development Financing Agreement for KAPP I was "to assist the Borrower in its efforts to increase agricultural productivity" which the agreement stated would be achieved "through improvement of the systems supporting the development, dissemination and adoption of modern farming practices and technologies" (World Bank 2004c). The PAD further elaborated KAPP I's PDO as to "improve the overall system by supporting the generation, dissemination and adoption of agricultural technology through (a) reforms in extension to increase pluralism, responsiveness to clients and participation by private providers; (b) an evolutionary change in the existing system of agricultural research to improve accountability and impact; and (c) increased

empowerment of producer organizations to influence the planning, design, implementation, funding and monitoring and evaluation of research, extension, training and capacity building activities" (World Bank 2004b). In addition, the PAD identified specific triggers KAPP I needed to meet before proceeding to the subsequent phase II investments.[15] The PDO was not revised during implementation.

Relevance of Objectives

3.2 **The relevance of the objective of KAPP I is rated substantial.** The objective was highly relevant to support the SRA that was current at the time of appraisal and aimed at revitalizing the stagnating agricultural sector. The PDO was also well aligned with Kenya's Economic Recovery Strategy (ERS; 2003–07) and targeted sustainable productivity growth in agriculture to stimulate broad-based economic recovery and accelerate poverty reduction. Making both agricultural research and extension demand driven, pluralistic, and inclusive was conceived by the government as the key pillars in modernizing smallholder agriculture.

3.3 The objective was also consistent with the World Bank's 2004–07 Country Assistance Strategy (CAS) which had the full participation of the Multilateral Investment Guarantee Agency (MIGA) and the World Bank Institute. The KAPP I objective was in line with one of the CAS themes which aimed to reduce vulnerability and strengthen communities through increasing agricultural productivity and competitiveness and reducing poverty in the poorest rural areas (World Bank 2004d). In particular, the World Bank's effort to support the transformation of Kenya's research and extension system was reflected in the reference to KAPP I in CAS and its results framework. KAPP I objectives remained highly relevant to the World Bank's strategic objectives after the extension of CAS to 2008 (World Bank 2007).

3.4 Overall, KAPP I's objectives were responsive to critical agricultural policy landscape transformation and institutional reforms that are necessary to raise farm productivity and income of Kenyan smallholder farmers. However, the objective as stated was vague and the effectiveness and extent of the "assistance" to the government in its effort to increase agricultural productivity was difficult to measure. In addition, the formulated means of how to achieve the objective were complex and highly ambitious, and required "improvement of the systems supporting the development, dissemination and adoption of modern farming practices and technologies" through the 3-year project, despite the 12-month extension.[16]

Project Design

3.5 KAPP I design incorporated lessons from the National Agricultural Research Project, phase II, which represented the second project under which the World Bank had provided substantial financing for KARI's core research activities and for building up its capacity. It also drew on World Bank experience in Uganda in the National Agricultural Advisory Services Project by underlining the need for mobilizing private service

providers alongside the public sector, and adequate institutional space and incentives for collaboration between researchers, agricultural service providers, and farmers. KAPP I thus aimed to consolidate the gains of the World Bank's previous engagement in the agricultural sector in Kenya and address challenges in the project design.[17]

3.6 KAPP I adopted a sectorwide approach to engage a wide array of stakeholders, both individuals and institutions, to stimulate Kenyan agricultural productivity collectively and concurrently from different angles. These stakeholders ranged from individual small-scale farmers and farm communities to the government ministries and their constituent departments, interministerial steering committees, public and private implementing agencies, research institutions, universities, NGOs and community-based organizations at the national level and on down to districts, divisions, and locations.

3.7 At appraisal, the project developed a results framework and a planning, monitoring, and evaluation framework (PM&E) to elaborate seven key performance indicators (KPI).[18] To determine the impact and effectiveness of the technology generation and dissemination system, the project contracted Tegemeo Policy Research Institute to undertake a baseline survey of rural households between July and September 2006 which was designed to provide a comprehensive set of data for evaluation and impact assessment.

3.8 KAPP I was designed around four components: (i) **facilitation of policy and institutional reforms** to transform previously disparate and disjointed efforts into a coordinated system within the government that results in improved outcomes and more efficient resource allocation; (ii) **support to extension system reform** to facilitate a consultative process that will build consensus among stakeholders for a new extension concept and policy; (iii) **support to research system reform** to reform the agricultural research sector so that it encompasses a plurality of actors and becomes more efficient and accountable; and (iv) **support to farmer/client empowerment** to establish and support client consultative structures at all levels, and to provide means for improved access to research, extension, and technology services. For details on project components, see appendix C.

Relevance of Design

3.9 **The relevance of design of KAPP I is rated substantial.** The design, including the project's theory of change, was generally well conceived and incorporated lessons and experiences from previous World Bank operations. The design included a baseline survey for establishing benchmarks and regularly monitoring data collected through the Tegemeo Institute, which has expertise and experience in impact evaluation. The baseline survey also was intended to establish a robust gender-disaggregated project baseline to mainstream gender into the project implementation. The sectorwide approach to engage relevant government institutions, in addition to the creation of

KAPP I specific institutions, strengthened the coordination and implementation of KAPP I to translate the overall objectives at national levels.

3.10 The main deficiency of the design was the vagueness of the overarching project objective and lack of clarity as to how the components (formulated as the "means" rather than objectives by themselves) would contribute to the core objective. The results framework lacked a clear results chain between the project's inputs, outputs, and outcomes. Baseline data were not collected until long after project effectiveness, and the key performance indicators in the results framework were, to a large extent, input-output indicators and did not allow measurement of the extent to which the PDO was achieved. Another weakness was the overreliance on KARI as the public research institution to implement the multidimensional research and development project and assume financial and judiciary responsibilities.

3.11 As a lending instrument, the multiphased APL was appropriate and relevant at the time to enable the envisaged structural transformation through periodic review and realignment. However, the project allocation of three years for the first phase was too ambitious and unrealistic to set up the keystones for the proposed interventions in the subsequent phases.

Implementation

Project Management

3.12 Although various taskforces and committees had already been set up by the government of Kenya to implement SRA, KAPP I contributed to the establishment of others for implementation of the project (see figure D.1 in appendix D). The KAPP Steering Committee and the KAPP Secretariat were created to have a wide-ranging mandate to address cross-cutting interventions among individual line ministries. Linking the KAPP Secretariat to the existing SRA institutions, an interministerial coordinating committee of ministers, the Ministry of Agriculture, Ministry of Livestock and Fisheries, KARI, and national forums provided the necessary cross-cutting links to implement such a far-reaching project. The KAPP Secretariat also acted as secretary to the steering committee and convener of project-specific consultative processes at the national level that could include research and extension taskforces. KAPP I also created farmer forums at district, division, and village levels as a platform for interaction with CIGs, and to liaise with the national farmers' forum. District Service Units (DSUs) provided a focal coordination to translate the functions of the KAPP Secretariat at the district levels and to communicate with district development committees as well as district agricultural committees for implementing activities on the ground.

Implementation Experience

3.13 The project implementation at the outset was hindered owing to a short project preparation period, which took about nine months from concept review (October 2003), to appraisal, negotiations (March 2004), and legal agreement (June 2004). As a result, a number of activities generally undertaken during the preparation phase such as the baseline survey, studies to address knowledge gaps, preparation of project implementation plans and other manuals, technology inventories, and institutional assessments in agricultural research, extension training, and farmer organizations, were shifted to the implementation period. Together with the other tasks planned (such as policy reforms in research and extension, testing of extension approaches and farmer empowerment), this was an ambitious set of activities for the initial three-year goalpost. The implementation was further delayed by the KAPP Secretariat's lack of experience in managing a multisectoral project with community involvement, which required setting up new structures at the district and local levels (for example, the DSUs and village farmers' forums). In addition, the run-up to the national elections in December 2007, and the postelection civil unrest disrupted project implementation for a number of months.

Safeguards Compliance

3.14 The project was given the Environmental rating of C and Social rating of S 3, and hence no Safeguard Policies were triggered (World Bank 2004e). Nonetheless, it was recommended to monitor impacts on indigenous people at the end of phase I and to incorporate special measures as deemed necessary. This impact monitoring had not been carried out at project closing. An environmental and social sustainability audit was conducted, whereas a strategic environmental assessment was envisaged but not completed by project closing (World Bank 2010a).[19]

Financial Management and Procurement

3.15 Notwithstanding the identification of financial management risks in the PAD,[20] the project did not have sufficient time to ensure a smooth transfer and accountability of funds, including the creation and staffing of KAPP I institutions. Weak financial management and unstable funds flow caused substantial setback in KAPP I implementation throughout the project period. The delays and irregularities in provision of counterpart funds, reporting, and audits, and weak oversight of financial management were major impediments. Considerable delay had occurred in releasing funds to the DSUs from KARI and tracking of fund utilization by beneficiaries was inadequate. The initial lack of simplified reporting arrangements contributed to delays in advances to DSUs, and fund transfers to CIGs had to rely on intermediaries (such as NGOs) for the approved subprojects.

3.16 During the first two years, the absorption of funds was as low as 30 percent of the appraisal amount. KARI, which had the fiduciary responsibility for the project, was

overwhelmed by the sectorwide and multi-institutional nature of the project and diverse accounting systems of partners and collaborators. The lack of an independent oversight function led to insufficient internal audit, which relied heavily on KARI's internal audit staff. Following the World Bank's recommendation in December 2005, the project switched from the statement of expenditures to a financial monitoring reporting system and carried out remedial actions to improve the timeliness, efficiency, and effectiveness of the financial management system in disbursing funds.[21] As a result, the disbursement rate and the absorption of funds improved during the remaining project period.

3.17 However, several financial management issues persisted. These included late submissions or discrepancies and inconsistencies in financial management reports, lack of supporting documents, delays in submission of audit reports, which noted lack of schedules to support expenditures, and weaknesses in accounting and internal control. At the time of project closing on December 31, 2008, a World Bank review found that a substantial amount of funds intended for community-level activities had not reached the beneficiaries. This prompted the World Bank to request a special audit for KAPP I to account for $2.2 million in expenditures (World Bank 2010a). IEG communication with the World Bank team in the Kenya country office confirmed that the auditors eventually received sufficient documents and the remaining amount in dispute was cleared.

Achievement of the Objective

3.18 This section assesses the overall efficacy of KAPP I by looking at the evidence on outputs and outcomes around the three key elements identified as contributing to the achievement of the project's overall objective, namely the generation, dissemination, and adoption of agricultural technology. The methodology and instruments used for data collection are described in appendix E. The main outputs from the three elements designed to contribute to the PDO are described below.[22]

Outputs

3.19 **Output 1 – Generation of Technology: Put in place an evolutionary change in the existing system of agricultural research.** This element was designed to reform the agricultural research system for improving effectiveness and accountability and enhancing KARI's ability to demonstrate impact.

(a) NARS policy development. The NARS policy (and its implementation framework) for establishing an integrated and holistic national agricultural research system that is responsive to demand-driven and market-oriented technology generation was drafted and submitted for review but was not completed as it required further review and endorsement by the three agriculture line ministries.

(b) Competitive grants financing to non-KARI research institutes. KAPP I commissioned six projects from the first cycle. Three of these projects were from non-

KARI institutions. In the second cycle (from 20 projects supported), about 65 percent of the financing went to non-KARI institutions.

(c) NARS (KARI and non-KARI) technology inventory. KAPP I was used as core funding to support multiple initiatives of KARI spanning food crops, horticulture and industrial crops, animal production, animal health, biotechnology, and seed production.[23] Improved varieties maize (total 29), wheat (4), sorghum (3), pearl and finger millet (2), and cassava (21) were developed and registered. In livestock health, six vaccine and immunization kits were developed for different animal diseases. The comprehensive technology inventory and institutional assessment of NARS, technology inventory database, and ISO certification were initiated but not completed.

(d) Resources allocation and accountability devolved to centers. After some delay, the process for devolving the responsibility of approving projects and resources to the research centers was initiated only for adaptive research activities. This led to a slow start for the non-KARI competitive research activities and adversely affected the implementation progress.

(e) Management information system (MIS) for project planning, monitoring, and evaluation. An integrated MIS with feedback mechanisms to allow management to identify weaknesses in operations and make appropriate adjustments was initiated. The MIS components, including databases and the M&E framework and reporting formats were developed, but the MIS was not finalized and rolled out.

(f) Decentralization of ATIRI proposal review and approval process. The Agricultural Technology and Information Response Initiative (ATIRI) was launched in KARI in 2000 to address concerns that agricultural research did not lead to technology adoption and improved rural livelihoods. To shift away from the supply-driven approach, KAPP I supported ATIRI to focus on farmer empowerment to enable them to articulate their needs. Under KAPP I, ATIRI funded 115 community-based organization proposals and more than 300 technology requests were approved.[24]

3.20 Output 2 – Dissemination of Technology: Reforms in extension to increase pluralism, responsiveness, and private sector providers.

(a) Revision of the National Extension Policy. KAPP I supported a consultative process for the formulation and development of the national extension policy and its implementation framework. The extension task force reviewed and updated the National Agricultural Extension Policy (NAEP) and developed the National Agricultural Sector Extension Policy (NASEP) and its implementation framework (NASEP-IF). This sectorwide policy was developed through a wide-ranging consultative process and was adopted by the agriculture sector ministries and endorsed by the Cabinet. ATIRI through KAPP I supported a total of 350 community-based organizations to disseminate technologies to some 500,000 farmers nationwide.[25]

(b) Piloting of extension approaches in target districts. The project piloted multiple extension approaches and identified promising models for the different regions and farming systems. The approaches tested included farmer field schools, training and visits, the focal area approach (using CIGs), farming systems approach, pastoralist approach, and seminars. The focal area approach, which embraced participatory methods such as CIGs for demand-driven service delivery through active participation of farmers, was most preferred (50 percent). This was followed by farmer field schools (42 percent) encompassing farmer-to-farmer extension, allowing farmers to learn from other farmers.[26] However, the piloting did not consider the cost-effectiveness of the different approaches. This was an important omission in testing efficiency.

(c) Enterprise Development Plans (EDPs). The EDPs were developed jointly by the members of CIGs and service providers to facilitate commercialization of agriculture. The project during the first cycle supported development of 1,115 EDPs with a total of 112,728 farmers directly benefiting. The second cycle for 1,256 EDPs was under development when the project closed. A total of 1,250 CIGs were established in all KAPP I locations and participated in developing EDPs.

(d) Number and types of service delivery agents actively operating in pilot districts. KAPP I developed an inventory and database register of the key agricultural extension service providers in the 20 pilot districts. A total of 986 service providers were identified as supporting the implementation of 1,115 EDPs in the pilot districts, including 482 (48 percent) private providers and 504 (52 percent) public providers.

3.21 **Output 3 – Adoption of Technology: Increased empowerment of producer organizations.** The value added from KAPP I in enhancing collective action and farmer and client empowerment at the local level has not been measured. Many of the performance indicators focused on the number of groups and client platforms rather than providing better evidence on how the project contributed to improving group performance and how this affected outcomes.

(a) Client forums for farmer empowerment. Eighty client forums were established at 20 districts and the members participated in project activities. A total of 1,250 CIGs with a membership of 96,443 smallholder farmers interested in nine different value chain categories developed EDPs. Kenya National Farmers Federation (KENAFF) was engaged to build the capacity of CIGs, but the outcomes are not assessed in the evaluation documents.

(b) Support for apex commodity organizations. A total of 19 apex/commodity organizations and one national apex organization were identified and supported. A council of commodity association was established to coordinate the capacity building initiatives for these organizations.

Outcomes

3.22 The project had three PDO outcome indicators to capture the main objective of "assisting the Borrower in its efforts to increase agricultural productivity" through improvement of the systems supporting the development, dissemination, and adoption of agricultural technology (World Bank 2004b, 26). This section discusses the evidence that the project assisted the government to increase agricultural productivity based on three subobjectives noted in the earlier discussion of the PDO (paragraph 3.1) spanning technology development, dissemination, and adoption, namely the means by which the overall objective was to be achieved.[27]

Subobjective 1: An evolutionary change in the existing system of agricultural research to improve accountability and impact

3.23 An integrated research policy and institutional framework was not achieved. A NARS policy was drafted but not adopted. In addition, KARI was not able to establish a system for sustainable and diversified financing of its research activities and continues to rely on government and donor sources.[28] The IEG team meetings with senior leadership of KALRO in July 2018 confirmed that neither the Agricultural Research Investment Service (ARIS) nor the Agricultural Research Trust Fund, which was conceived as a research endowment fund, materialized. These unrealized targets were transferred to phase II of KAPP. Overall the efficacy of this subobjective was rated **modest.**

Subobjective 2: Reforms in extension to increase pluralism, responsiveness to clients, and participation by private providers

3.24 An integrated extension policy and institutional framework was achieved. Review and revision of NASEP and its implementation framework was finalized in January 2007.

3.25 IEG reviews of project reports on results related to technology dissemination show that 45,000 improved seedlings for fruit trees, 1.5 million cassava cuttings, and 1.66 million sweet potato tubers were distributed by KARI, reaching some 300,000 farmers through seed distribution by more than 10 NGOs in collaboration with the KARI Seed Unit and the Ministry of Agriculture.

3.26 To assess the achievement of this subobjective, IEG also looked at results from extension and diffusion in terms of technology adoption. The baseline data were relevant for monitoring the uptake of new technologies. The sample design and allocation for the 2009 adoption survey followed the baseline survey but covered only nine districts within the same eight agro-regional zones, which could affect the level of precision in estimating the adoption effects. [29]

3.27 Nevertheless, the difference in difference analysis[30] using the baseline and adoption data showed that adoption of improved maize increased by 6.6 percent above the baseline across the agro-regions as a result of KAPP I interventions (table 3.2).[31] This amounts to an average 11 percent net increase in adoption relative to the baseline in the target areas. The analysis also shows a modest 4.3 percent increase on the intensity of fertilizer use on maize across the agro-regions (table 3.3). As with hybrid seed maize, the changes are lowest in traditional maize growing areas where modern seed and fertilizer use are relatively high, but more substantial in nontraditional areas for maize (such as the coastal lowlands). The adoption effects across other crop and livestock technologies also show a modest overall effect, except for improved dairy cows (table 3.4). The net additional adoption increase for improved dairy is about 11 percent, which indicates an overall tripling of adoption of modern cows compared with the baseline status in the target areas.

Table 3.2: Adoption of Hybrid Maize Seeds (percent)

Agro-regional Zone	Before Project (KAPP Baseline Survey)		After Project (Technology Adoption Survey)		Difference in Difference	Net Change over Baseline (%)
	Target (A)	Control (B)	Target (C)	Control (D)	DiD effect (E) = (C - A) - (D - B)	
Central highlands	86	86	89.8	89.6	0.2	0.2
Coastal lowlands	29	26	35.4	26.7	5.7	19.7
Eastern lowlands	7	25	30.8	26.9	21.9	312.9
High potential maize zone	93	95	94.4	95.8	0.6	0.6
Western highlands	87	89	91.7	91.8	1.9	2.2
Western lowlands	19	22	19.7	26	-3.3	-17.4
West transition zone	26	53	69.3	62.2	34.1	131.2
Northern arid zone	0	0	26.7	0	26.7	-
Overall	59	61	62.3	57.7	6.6	11.2

Source: Based on KAPP impact evaluation report (Government of Kenya 2009d).

Table 3.3: Intensity of Fertilizer Use on Maize (kg/acre)

Agro-regional Zone	Before Project (KAPP Baseline Survey)		After Project (Technology Adoption Survey)		Difference in Difference	Net Change over Baseline (%)
	Target (A)	Control (B)	Target (C)	Control (D)	DiD effect (E) = (C-A)-(D-B)	
Central highlands	43	34	45.7	34.1	2.6	6.0
Coastal lowlands	3	1	11.6	2.2	7.4	246.7
Eastern lowlands	0	1	0.8	0.7	1.1	-
High potential maize zone	59	58	58.2	56	1.2	2.0
Western highlands	29	22	26	16.3	2.7	9.3
Western lowlands	3	2	2.3	1.1	0.2	6.7
Western transitional zone	13	18	19.5	17.8	6.7	51.5
Northern arid zone	0	0	3.7	0	3.7	-
Average	18.8	18.1	21	16	4.3	22.9

Source: Based on KAPP impact evaluation report (Government of Kenya 2009d)

3.28 The aggregate adoption values were expected to grow from 30 percent at the midterm to 40 percent at the end of the project. This was presumably specified by considering only the gross changes in adoption but not the net contribution of the project.[32] The adoption results achieved hence indicate that although the PDO indicator target values for adoption were not technology specific and did not specify the values at the baseline, the gross adoption indicator targets were met for maize and fertilizer use on all crops, but not for fertilizer use on maize, planting improved fruit trees, improved dairy cows, or use of mulching and conservation agriculture practices. Nevertheless, the estimated net adoption results potentially attributable to the project are substantial (especially for hybrid maize, fertilizer on maize, improved dairy cows, and fruit trees) and showed substantial progress that the project made towards achieving its objectives. The efficacy of this subobjective is therefore rated **substantial**.

Table 3.4: Adoption of Other Crop and Livestock Technologies (in percent)

Technologies	Before Project (KAPP Baseline Survey)		After Project (Technology Adoption Survey)		Difference in Difference	Net Change over Baseline (%)
	Target (A)	Control (B)	Target (C)	Control (D)	DiD Effect (E) = (C-A)-(D-B)	
Growing improved fruits	5.3	3.9	7.1	4	1.7	32.1
Use of fertilizer on all crops	63	60	60	52.1	4.9	7.8
Use of fertilizer on maize	18	18.1	21	16	5.1	28.3
Animal feed preservation	56.7	43.5	62.2	44.7	4.3	7.6
Improved dairy cow breeds	5	7	19.3	9.9	11.4	228.0
Mulching/conservation technologies	7.5	9.9	13.1	12.4	3.1	41.3

Source: Based on KAPP impact evaluation report (Government of Kenya 2009d)

Subobjective 3: Increased empowerment of producer organizations to influence the planning, design, implementation, funding and monitoring and evaluation of research, extension, training, and capacity building activities

3.30 Piloting of pluralistic extension approaches and supporting client empowerment in the 20 districts achieved its target. There were three key aspects to assess this subobjective: (i) preparation of Enterprise Development Plans (EDPs), (ii) participation of CIGs in value addition/scaling up of technology innovations, and (iii) service delivery agents actively operating in pilot districts. Under the first, KAPP I supported the preparation of 1,115 EDPs engaging some 112,728 farmers as beneficiaries (against the target of 1,350 EDPs).[33] Since the project closed before the second cycle of EDPs was completed, the achievement is substantial. In terms of scaling up technologies KAPP I funded 176 projects against the target of 240 projects. It also supported 92 CIGs with grants to scale up technology innovations. The project also contributed to the emergence of 1,192 service providers, including 609 public and 583 private providers in the target districts. The efficacy of this subobjective was rated **substantial.**

3.31 Summary. The evidence indicates that KAPP I was effective in supporting reforms in extension systems and in creating participation and empowerment of farmers (including women) through farmers' networks and producer organizations but was less effective in the achievement of the national research policy and institutional framework. However, the research process produced technologies relevant to improving productivity. The achievement of these subobjectives shows that the project made significant contributions toward achievement of the overall objective "to assist the Borrower in its efforts to increase agricultural productivity." However, as will be noted later, some of the key results were not sustained.

Efficiency

3.32 **Efficiency of KAPP I is rated modest.** At appraisal financial and economic analyses were performed at phase I completion. The analysis using farm models was done over 20 years in order to assess the economic and financial soundness of the project.[34] The assumptions of the ICR efficiency analysis are largely drawn from the PAD (for example, they focus on the quantifiable benefits and do not include indirect and nonquantifiable benefits, or generation of exportable outputs, and the *without project* situation is equated to the situation where the farmers have not adopted the promoted technological package)[35]

3.33 Owing to difficulties with the data, the economic and financial analysis in the ICR focused on the benefits arising from agricultural research (component 3) and estimated the economic and financial rates of return and the net present value (NPV) based on two enterprises, maize and potato, which were not representative of the multiple enterprises targeted by the project (World Bank 2010a). Compared with the

baseline, the technology adoption survey showed no significant and immediate benefits from the overall production of maize and potatoes in the target areas after the four years of KAPP I. The ICR accorded the low returns to droughts, the predominance of rain-fed cultivation, and the 2008 postelection civil unrest. Lack of early impact was to be expected from research which shows a long lead time, but it would be reasonable to expect some shorter-term benefits from extension in the application of existing technologies. However, the rate of technology adoption measured by the "endline survey" quoted in the ICR also revealed a minimal adoption rate among target households that is far from the PAD target after 20 years.[36] The analyses of economic and financial rates of return in the ICR were performed assuming a doubling of yields owing to the combined effects of research and extension services and favorable rains.

3.34 Despite the unrealistic assumption of doubling of crop yields over the national crop area, the economic analysis shows the economic and financial rates of return of the enterprises examined to be above the 12 percent threshold. The economic and financial analysis showed a large discrepancy between the baseline economic and financial rates of return in the PAD and in the endline survey mentioned in the ICR. For maize, the economic rate of return was 25 percent (compared with 38 percent in the PAD), maize FRR was 15 percent (compared to 48 percent in PAD); for potato it was 37 percent (compared with 33 percent in the PAD). The financial rate of return for potato was 18 percent (compared with 35 percent in the PAD). Although both financial and economic NPVs at a discount rate of 12 percent are positive and much higher than at appraisal, they were very sensitive to an increase in the discount rate. The ICR further noted that a contributing factor for the moderate efficiency of KAPP I is the low yields in maize and potato in 2008: a 25 percent increase in maize yields in 2008 would have increased the financial rate of return up to 41 percent and the economic rate of return up to 59 percent.

3.35 This finding implied that efficiency over the long term is modest, unless yields double and adoption is widespread. The project's actual efficiency might be lower than estimated for a number of reasons. First, as the baseline data show, the *without project* situation cannot be equated to the situation where farmers have not adopted any modern crop and livestock technologies. The marginal gains over the existing improved technologies are therefore likely to be lower and will not lead to doubling of yields. Second, the assumed expansion in adoption progressively reaching the national crop area (for example, maize) is not supported by the field-level evidence as many of the interventions have not been sustained beyond the second phase of the project.

Ratings

Outcome

3.36 **The overall outcome rating for KAPP I is assessed as moderately satisfactory**. This conclusion is based on this report's assessment that the relevance of the project's

objectives and design were rated **substantial**. The efficacy of the subobjectives of an evolutionary change in the existing system of agricultural research; reforms in extension to increase pluralism, responsiveness to clients and participation; and increased empowerment of producer organizations to influence the planning, design, and implementation of research and extension were, respectively, **modest**, **substantial**, and **substantial**. The estimated efficiency of the project was **modest**. Based on these ratings the project revealed moderate shortcomings and its outcome is therefore rated **moderately satisfactory.**

Risk to Development Outcome

3.37 **Risk to development outcomes is rated high**.

3.38 KAPP I initiated important reforms in the national agricultural research and extension systems which were critical for revitalizing agriculture and enhancing the performance of the technology supply and demand system in Kenya. However, both local ownership and the capacity for implementing NASEP at the county level has been significantly eroded in subsequent years. Except in some profitable value chains, the anticipated changes in nudging the private sector service providers to step in and revitalize the largely ineffective extension service did not materialize. The IEG mission and field studies indicated that, with some exceptions, both the public and private extension systems were weak and unable to provide essential services to farmers.[37]

3.39 This indicates that the development outcomes initiated through the project face high risks of not being maintained or sustained (see the section on KAPP II for details). Addressing this risk requires a better understanding of circumstances where the contracting approach could work to make extension more effective and responsive to client needs and the appropriate division of roles and responsibilities between the national and local governments in modernizing extension services.

Bank Performance

3.40 Quality at entry was **moderately unsatisfactory**, but Bank supervision was **moderately satisfactory**. **Overall Bank performance is rated moderately satisfactory**.

Quality at Entry

3.41 Bank performance in ensuring quality at entry was **moderately unsatisfactory**. Quality at entry was adversely affected by the rushed appraisal process which did not allow sufficient stakeholder consultation (for example, on farmer empowerment and core project components) and weak M&E arrangements, including design of the results framework and linkages between activities, outputs to outcomes. The project also suffered from inadequate implementation arrangements and the weak financial management system that persisted throughout phase I. The mechanism for the flow of funds to the target districts had not been established at project start up, delaying

disbursements. The World Bank overestimated the financial management strength of KARI to implement a complex and multiagency project that goes well beyond research and underestimated the time needed to build the capacity of the KAPP Secretariat and DSUs.[38] In addition, more attention could have been given to enhancing the financial management capacity of KARI and ensuring preparation of project manuals before project startup. Without such tools, the project was not ready, and its financial management system was ineffective in implementing supervision recommendations.

Quality of Supervision

3.42 Bank supervision was rated **moderately satisfactory**. The World Bank's task team leader was based in Nairobi, thus the project benefited from frequent and continuous interaction, and project supervision was carried out regularly. The supervision missions identified implementation bottlenecks (including fiduciary issues) and provided proposed solutions and action plans to address them. This included the recommendation to formally amend the M&E framework of the project after the midterm review, but this was not implemented by the borrower. In addition, the ICR notes that a safeguards specialist was not included in the supervision missions perhaps because of the C rating for the environment category of the project (World Bank 2009a, 16).

Borrower Performance

3.43 **Borrower performance is assessed as moderately satisfactory**.

Government Performance

3.44 The government of Kenya maintained strong commitment to the project and its performance is rated **satisfactory.** This is evidenced by the commitment to the implementation of SRA, substantive policy and institutional reforms in agricultural research and extension, the establishment of the sectorwide coordination unit (ASCU) and the Inter-Ministerial Coordination Committee to guide implementation, the KAPP Secretariat, and provision of counterpart funding for the project. However, the recommended changes in the project's M&E framework after the midterm review to clarify and improve measurement of key performance indicators were not formally approved by the borrower.

Implementing Agency Performance

3.45 The performance of the implementing agencies was **moderately unsatisfactory**. The agriculture line ministries had oversight responsibilities through the ICC, but KARI was responsible for fiduciary matters. KARI took time to coordinate effectively and to implement the World Bank–recommended financial monitoring reporting system, which caused excessive delays in disbursements and delayed implementation by at least one year. KARI was also unable to complete an inventory of available technologies and data

systems for the NARS and made limited progress toward establishing a sustainable funding mechanism to reduce dependence on external funds. The research activities suffered from lack of robust priority setting, resulting in multiple initiatives and a highly fragmented research portfolio, which impaired meaningful progress in tackling major challenges and developing solutions for improving productivity and revitalizing agriculture.[39] On the local development side, the newly established implementing units, the KAPP Secretariat at the national level and the DSUs at the local level, also faced challenges in timely disbursement of funds to local activities and to function effectively.

Monitoring and Evaluation

3.46 **The overall M&E quality rating is substantial.** The M&E design, however, had some deficiencies in the theory of change which links activities, outputs, outcomes, and impacts. The PDO itself was vague and ambitious to achieve during the project's first phase. Also, some of the PDO indicators did not capture the actual outcomes but outputs from specific activities (for example, testing of pluralistic extension approaches).

M&E Design

3.47 The project had an M&E framework that was designed at appraisal. The design for baseline and endline data collection from treatment and comparison (control) groups for proper attribution was especially commendable. The deficiency as the ICR noted was that the implementation of extension, collaborative research, and farmer empowerment activities at the local level required refining the results framework to reflect and capture local realities (World Bank 2010a). But this was not implemented because the changes were not formally amended.[40]

M&E Implementation

3.48 The baseline survey and the comprehensive inventory of agricultural extension service providers in Kenya was delayed and started only in 2006 owing to administrative and contracting inefficiencies. The Tegemeo Institute collected valuable baseline data using a sound design which allowed capturing relevant data from both targeted and control locations. [41] Nevertheless, the final survey conducted by a different firm drastically reduced the sample and scope, affecting the quality of the adoption study. The very ambitious effort to "establish a harmonized, sectorwide M&E system for the entire agricultural sector at the national level" also did not materialize.

M&E Use

3.49 The progress made in the design and development of a consolidated and digitized project M&E system for general research, extension, and farmer empowerment was minimal (Government of Kenya 2006). The KARI MIS for project planning, monitoring, and evaluation was developed but not rolled out and implemented. There is scanty evidence on how M&E contributed to inform and shape project management and

key decisions and interventions. However, standardized tools and procedures for reporting on the extension services delivery pilots and the farmer empowerment component were developed and utilized. At the district level, M&E tools for DSU work-planning and budgeting instrument and standardized reporting were developed, and routine monitoring of project progress was undertaken at the DSUs despite their limited and uncertain budgets (Government of Kenya 2006). In addition, phase II of the APL (KAPAP) was approved by the World Bank management based on achievement of APL triggers from phase I.[42]

4. KAPP II: Kenya Agricultural Productivity and Agribusiness Project (KAPAP)

Relevance of the Objectives and Design

Objectives

4.1 The Financing Agreement between Kenya and the IDA, dated July 2009, specified the PDO of the second phase to "increase agricultural productivity and the incomes of participating smallholder farmers in the Project area" (World Bank 2009c). The PDO remained unchanged throughout its implementation period, despite a restructuring prescribed by the midterm review in June 2013. Triggers for moving from the second to the third phase were specified in the original PAD of the APL.[43]

Relevance of Objectives

4.2 **The relevance of objectives of KAPAP is rated substantial.** KAPAP was a continuation of the World Bank's long-term response to support the SRA, and analytical work in 2008 showed that agriculture-led growth was more than twice as effective than industry-led growth in reducing poverty in Kenya. At project appraisal, objectives were highly relevant and in line with the government's priorities for the agriculture sector as reflected in the its new development strategy, Vision 2030, which was launched in 2008 replacing the Economic Recovery Strategy as a long-term national planning strategy (Government of Kenya 2010). Vision 2030 identified agriculture as one of the key sectors for its realization of 10 percent annual economic growth and poverty reduction targets.[44] At project completion, the project's objective continued to be fully aligned to the government of Kenya's priorities for the agriculture sector and the updated Agricultural Sector Development Strategy (ASDS) for the period 2010–20. The ASDS emphasized the importance of the agricultural sector as the key to food security and poverty reduction and aimed to transform the sector from subsistence to innovative, commercially oriented and modern agriculture. The PDO mirrored the strategic thrust of ASDS in increasing productivity, commercialization, and competitiveness of agricultural commodities and enterprises.[45]

4.3 The PDO remained well aligned with the World Bank's 2004–08 CAS for Kenya. The objectives were also highly relevant to the World Bank's Kenya Country Partnership Strategies (CPS) throughout the periods FY2010–13 and FY2014–18. Building on lessons from the CAS FY2004–08, CPS 2010–13 continued to support the government of Kenya to implement the Vision 2030 and its Medium-Term Plan (2008–12). It identified a focus on enhancing agricultural productivity as a high priority for food security, tackling poverty, and unleashing Kenya's growth potential (World Bank 2010b). KAPAP also reflected the World Bank's commitment to advance women's economic empowerment outlined in the Gender Action Plan (FY2007–10) and it was featured in the CPS 2010–13 for the project's commitment to mainstream gender in the agriculture sector. The CPS 2014–18 also recognized the need to boost agricultural productivity to reduce poverty and achieve inclusive growth (World Bank 2014a). The cancellation of the third phase of the APL raised concerns about the relevance of objectives at completion and affected continuity and scaling up of success stories, but some of the effort has continued through other ongoing projects (such as the National Agricultural and Rural Inclusive Growth Project).

Project Design

4.4 In pursuing the PDO, KAPAP focused on consolidating reforms in research, implementing reforms in extension, establishing the basis for sustainable financing of the entire system, and building the necessary policy and related frameworks for a sectorwide approach. Activities were conceived to transform and improve the performance of the agricultural technology systems, empowering men, women, youth, and other stakeholders, and promoting the development of agribusiness.[46] The project was thus designed to enhance (i) agricultural productivity (through support to agricultural research, extension, and empowerment of farmers and other service providers); (ii) diversification and value addition in agriculture, livestock, and fisheries; and (iii) promotion of public-private partnerships in service delivery and agribusiness development. It was also linked to the World Bank's East Africa Agricultural Productivity Project (EAAPP-P112688) and other projects.[47]

4.5 To scale up and consolidate the gains achieved in KAPP I, KAPAP followed the milestones laid out in the sectorwide approach and the 20 districts originally covered by KAPP I, which were subdivided into 59 districts in phase II. Considering the need for a realistic timeframe after KAPP I closed in December 2008, KAPAP extended the phase II duration from four to five years (FY2010–15) to allow sufficient time for implementation of activities. To measure attainment of the PDO, KAPAP proposed four KPIs.[48] Reflecting on lessons from KAPP I, KAPAP aimed to facilitate the creation of a nationwide centralized MIS system, and to develop a customized MIS and build capacity and efficiency of M&E and project management.

4.6 The design of KAPAP evolved around four components, of which three are a continuation of the components supported in phase I. The three components continued from phase I were (i) **policy/institutional and project implementation** to improve coordination of the sector and project implementation structures; (ii) **agricultural research systems** to support the research system in the country; and (iii) **agricultural extension and farmer and other stakeholder empowerment** to support the government to implement the National Agricultural Sector Extension Policy (NASEP) and lay the foundations for sustainable intensification and diversification of agricultural production systems and improved linkages to both markets and agribusiness, and to generate greater impact for agricultural productivity growth and improved risk management. A fourth component, **agribusiness and market development,** was added to empower public and private stakeholders along selected commodity value chains to plan, design, and set up sustainable agribusinesses.

4.7 Following the midterm review in June 2013, which rated the KAPAP implementation progress toward meeting its PDO as **moderately unsatisfactory,** the entire results framework needed to be revised.[49] Although the number of project components was maintained, a series of restructurings were made to some of the components (World Bank 2013). Notably, the scope of **component 4** activities had to be downsized owing to severe delays, especially in developing the agro food parks and the agribusiness development centers. For details on project components before and after restructuring, see appendix C.

Relevance of Design

4.8 **The relevance of design of KAPAP is rated modest.** The underlying logic and theory of change (results chain) that tie the project's four components to the outputs and expected outcomes was not presented in the results framework. The results framework in the PAD included multiple outcomes and intermediate results indicators which were for the most part vague and unclear in terms of their relevance to monitoring and measuring results. The design was complex but appropriately ambitious, especially for components 1 and 4. The activities featured under components 2 and 3 reflected the links with KAPP I and were relevant, realistic, and directly aligned with the project objectives. Some of the component 1 activities targeting complex institutional reforms as well as completion and implementation of policies, strategies, and laws were certainly ambitious but also relevant to the PDO. Component 4 featured complex private sector activities, such as setting up agro food parks and agribusiness development centers for which prior experience and capacity did not exist. These approaches were not fully developed and lacked an analytical basis at the appraisal stage. Consequently, most activities under component 4 were difficult to implement and were either restructured or eventually dropped after the midterm review, and some of the allocated funds for this component were cancelled or reallocated to other activities.

4.9 Although the overall project coordination was improved, focusing on a sectorwide approach and working with country systems to eliminate stand-alone project implementation, a notable design deficiency was the lack of a sound financial management system with sufficient internal controls to ensure proper use of resources and accountability. In addition, the project M&E at the national level was designed late during project implementation and was focused largely on processes and less on outcomes.

Implementation

Project Management

4.10 Building on phase I, the implementation of KAPAP followed a sectorwide approach, consistent with the institutional framework envisaged by the government in its ASDS (see figure D.2 in appendix D). KAPAP received policy guidance from organs already set up by the government to implement the ASDS, whereas the overall coordination and fiduciary responsibility was vested with the Ministry of Agriculture, Livestock and Fisheries to strengthen the multisectoral coordination. The KAPAP Secretariat was fully responsible for facilitating and coordinating the project implementation with other implementing agencies. The former DSUs were converted into 20 RSUs[50] to implement the project in 59 districts which were subdivisions of the original 20 KAPP I districts. KAPAP reviewed and revised the Farmer Grant Manual (FGM) and Research Grant Manual (RGM) prepared in phase I and developed a Community Energy Grant Manual (CEGM) to specify the eligibility and implementation arrangements for the energy grants under component 4. RSU grant disbursement was in accordance with these manuals.

4.11 The midterm review in June 2013 recommended a revision of the project institutional framework to make it more effective, efficient, and, where necessary, align with the devolved system of government under the new constitution (World Bank 2013). Accordingly, the project operations at the county level were aligned with the devolved structures and the lower-level organizational structures were streamlined to avoid any duplication and cut costs.[51]

Implementation Experience

4.12 KAPAP was implemented during a time of profound transition involving major national governance reforms, including a new constitution (introduced in 2010) and commencement of a decentralized and devolved system of government in Kenya. The sector's institutional setting and hence the key implementing agencies for the project were restructured by consolidating policies for crop production, livestock, and fisheries under a single Ministry of Agriculture, Livestock, Fisheries and Irrigation. Agricultural

research has also been consolidated partly through KAPAP support into KALRO replacing the former KARI. These structural changes shaped the context of implementation, its achievements, and the sustainability of its outcomes.

4.13 IEG stakeholder interviews during its mission indicate that the devolution of power to the counties, while relevant, was introduced before adequate capacity was built to absorb the increased local responsibility for planning and implementing agriculture and rural development activities. The key stakeholders consulted stressed frequent incoherence of agenda priorities between the national and county governments which resulted in inconsistent resource allocation to the sector at the county level. Although support to the agricultural sector was prioritized in the national agenda, the IEG field visits indicated that the county governments (with some exceptions) were not able to prioritize support for agricultural extension (see appendix K, table K.2). The devolution and structural changes also affected the speed of implementation at the local level.

4.14 As evident in the midterm review in June 2013, KAPAP implementation progress was behind schedule owing to an initial eight-month delay in declaration of effectiveness and a subsequent seven-month delay in disbursement of funds to the project (World Bank 2013).[52] This delay caused project activities to come almost to a halt. KAPAP implementation also continued to face numerous financial management challenges as will be explained below. Based on these considerations, the World Bank rated the project implementation progress at the midterm review as **moderately unsatisfactory,** implying that KAPAP has been classified as "project at risk or problem project" in terms of achieving its development objective. Consequently, a project restructuring was prescribed along with at least $17 million of the credit amount to be cancelled and a reallocation of the remaining amount to improve project performance and implementation. Hence, the project was restructured by revamping the KAPP Secretariat and scaling down activities, including a reduction of the IDA credit by $16.1 million.

4.15 Twelve months after the restructuring, KAPAP implementation progress improved and promising results emerged across all project components and activities (World Bank 2014b).[53] The Implementation Status and Results Report rating improved to at least moderately satisfactory starting in December 2013. Disbursements also improved and reached 95.3 percent of the total adjusted credit amount. However, KAPAP was approved for a nine-month project extension to complete remaining activities by September 30, 2015.[54] The project extension also allowed consolidation of the various interventions and development of sustainability strategies. Nonetheless, the project underwent a second restructuring five days before the closing date to enable the borrower to conclude procurement processes, including commissioning and handing over of equipment and facilities, and establishment of sustainable business entities at the community level (World Bank 2017).

Safeguards Compliance

4.16 The project was classified as category B under the Environmental Assessment (OP/BP 4.01) as some of the infrastructure investments and community-driven subprojects could potentially have limited adverse effects on the human population or environmentally important areas.[55] As a result, the World Bank safeguards policies related to environmental assessment (OP/BP 4.01), pest management (OP 4.09), and indigenous peoples (OP/BP 4.10) were triggered. The project implemented the safeguards policies specified under these triggers (World Bank 2016, paragraph 38 and Annex 5). In May 2009, the government prepared an Environmental and Social Management Framework (ESMF), the Integrated Pest Management Framework (IPMF), and the Indigenous Peoples Planning Framework (IPPF) concerning the Ogiek and Sengwer to serve as a strategic guide for the integration of environmental and social considerations in the planning and implementation of the activities (Government of Kenya 2009a, 2009b, 2009c).[56]

4.17 The government also developed an Environmental Implementation Manual and a gender training tool in April 2010. The project carried out training on environmental and social safeguards (also covering gender issues) at the national, county, and community levels. In 2013, KARI developed an environment policy to provide a holistic framework for management of the environment and natural resources, including waste management, disposal of obsolete chemicals, pollution, rehabilitation, and restoration of degraded areas, among others.

4.18 In 2013, the Integrated Pest and Vector Management Plans were developed. Farmers were trained on methods to protect themselves while using pesticides and other chemicals and the safe disposal of empty containers and expired chemicals. Good Agricultural Practices (GAP), minimum residue levels in food, traceability, and food safety were included in the training.

4.19 The Indigenous Peoples Planning Framework (IPPF) was developed to ensure that the development process fully respected the dignity, human rights, economies, and culture of indigenous peoples and that the project has broad community support from the affected indigenous peoples.[57] The Sengwer in Trans Nzoia and West Pokot districts and the Ogiek in Nakuru District catchments were identified as the key indigenous peoples in the project areas.[58] Training of service providers on the IPPF was carried out in the three districts.

Financial Management and Procurement

4.20 The project was designed to reinforce the financial management capacity of the KAPAP Secretariat by seconding senior staff from the implementing agencies, but the quality of financial management remained unsatisfactory. The project submitted

quarterly interim financial reports and annual audit reports to the World Bank within the stipulated timelines, but recurring financial audit issues, low capacity at the local level to account for the funds, and delays in disbursement of funds to beneficiaries and subsequent delays in payments to service providers continued to clog financial flows. The repeated delays reflected the monitoring system's failure to track the irregularities in time for quick action. Initial disbursements to the project account were satisfactory but dwindled substantially in FY 2011/12 and FY 2012/13 to the extent that the project was not able to cover planned expenditures (Government of Kenya 2015b). Initial low absorption of funds was recognized during the midterm review in June 2013.[59] Factors that affected fund disbursement included long time to establish the necessary institutional frameworks for operationalization, delays in transfer of funds from the designated account into the project account, and delays in the refund of ineligible expenditure flagged in the National Treasury Internal Audit Department validation report (Government of Kenya 2015b).

4.21 After the project restructuring following the midterm review, an additional 48 percent of the allocated IDA funds was absorbed in FY2013/14, and no further financial management issues were reported, disbursement to the project and cash flows improved, and, for the first time, the project's annual audit reports submitted to the World Bank by December 2013 were unqualified. The National Treasury Internal Audit Department enhanced fiduciary controls by continuing to conduct risk-based fiduciary reviews at the project management unit, county service units, and CIGs.

4.22 Financial management suffered from severe weaknesses in tracking disbursements, which contributed to coding errors and misclassification of expenses. The system relied on manual accounting for entering data and reconciling items, which was tedious and difficult to restore information for monitoring and reporting purposes. According to the ICR (World Bank 2016, para. 19) "in September 2015, at the end of KAPAP, some $13.0 million was considered to be ineligible expenditures, largely because of lack of, or improper documentation," an issue that had also plagued phase I.[60] IEG communication with the World Bank team in the Kenya country office confirmed that the third joint World Bank Internal Audit Department verification exercise was concluded on January 31, 2017, with final residual ineligible expenditures of K Sh 167,563,754 ($1.675 million). This amount was refunded to the World Bank in full. Part of the ineligible expenditures was caused by funds unaccounted for by the disbanded Agricultural Sector Coordination Unit, which filed a court petition (World Bank 2017).

Achievement of the Objectives

4.23 This section evaluates the overall effectiveness of KAPAP by looking at the evidence on outputs and outcomes around the two key elements identified for achievement of the PDO (see appendix E for the overall methodology for data collection, analysis, and synthesis of the evidence from different sources). This will be assessed by

looking at the PDO in two parts: (i) increase agricultural productivity, and (ii) increase the incomes of participating farmers. However, these two objectives are at different levels of the results chain, because an increase in productivity to generate marketable surplus is often the precondition for increasing smallholder incomes, especially when product prices decline following technological change. Only net sellers who regularly produce a surplus over their own consumption needs would be able to benefit from market value chain development and increased demand even when farmgate prices are unchanged. However, farmgate price effects were not monitored during project implementation.

Objective 1 - Increase agricultural productivity of participating smallholder farmers in the project area

4.24 This objective aimed to increase agricultural productivity as measured by the increase in the growth rate of the average annual yield of selected agricultural products in smallholder farming systems. The project activities were expected to contribute to this objective by enhancing the generation, dissemination, and adoption of agricultural technologies. This was facilitated through activities for transforming and improving the performance of agricultural research and extension systems and empowering smallholder farmers through pluralistic, market-oriented, and demand-driven approaches to knowledge and innovation transfer in alignment with the National Agricultural Sector Extension Policy (NASEP).

4.25 The technology generation and national research targeted a large number of crops, livestock, animal diseases, and fish production activities, hence the targeted enterprises for increasing yields were not clearly defined and varied across targeted counties, leading to fragmentation of effort and weak economies of scale both in disseminating knowledge and innovations and contracting service providers to smallholders. The following sections discuss the outputs and outcomes related to this objective.

Outputs

4.26 This section focuses on KAPAP support to national agricultural research systems, including Kenya Agricultural Research Institute/ Kenya Agricultural and Livestock Research Organization (KARI/KALRO) and agricultural extension systems for generation, dissemination, and adoption of productivity-enhancing technologies.

Output 1a: Support to the National Agricultural Research System

4.27 KAPAP provided funding for eight competitive research grants in certain prioritized value chains (see appendix H for a list of competitive research grants funded and main outputs). This has produced some outputs in terms of new technologies as well as increased institutional capacity through training of graduate students. Some

research outputs included evaluating varieties from the International Crops Research Institute or Semi-Arid Tropics (ICRISAT) and identifying several sorghum varieties for brewing and industrial alcohol extraction which were adopted by some farmers. The Aquaculture Competitive Research Grant also enabled hatchery operators to increase production by an average of 20 percent through use of improved seed and good aquaculture practices developed by the research team (World Bank 2016, 25).

4.28 The competitive research grants supported a total of 61 students (50 MSc and 11 PhD) through training activities initiated mainly by the collaborating universities to create synergies by fast-tracking the research activities and achieving quality results while providing support to students for completing their thesis research (World Bank 2016, 26).

4.29 The project enabled KALRO to set up an information and communications technology (ICT) platform for sharing research information, advancing research and transfer of technology, and dissemination of information relating to advancements made in agricultural research (World Bank 2016, 26). This platform has strengthened KALRO's connectivity globally to capture and benefit from research conducted by other institutions and public universities. Nevertheless, KALRO was not able to lay the legal and financial framework for a sustainable funding mechanism as was conceived through the Agricultural Research Trust Fund for the entire National Agricultural Research System.

Output 1b: Support to the Kenya Agricultural Research Institute

4.30 With the enactment of the Kenya Agricultural and Livestock Research Act No. 17 of 2013, Kenya Agricultural and Livestock Research Organization (KALRO) was created replacing the old Kenya Agricultural Research Institute (KARI). The newly established KALRO had a broader mandate to coordinate research in 16 autonomous research institutes, as well as research programs in publicly funded universities.[61] However, although the progress of the institutional transformation had not been completed when the project closed, IEG visits to KALRO confirmed that the process has since been completed. KALRO has harmonized its human resources policy, which had created some disparities between the staff after the merger of the commodity research foundations (tea, coffee, and sugar) with KARI, and developed a new strategic plan (2017–21).

Table 4.5: KARI/KALRO Government Budget Allocation and Internal Revenue Generation

YEAR	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	Average
Government of Kenya allocated budget (K Sh, billion)	2.24	2.52	2.78	2.53	2.42	2.24	2.27	3.13	4.25	2.71
Annual increase of allocated budget		12.35%	10.36%	-9.11%	-4.34%	-7.52%	1.42%	37.96%	35.98%	9.64%
Internally generated (K Sh, billion)		0.27	0.38	0.34	0.52	0.59	0.53	0.65	0.88	0.52
Internally generated as share of government allocation		10.9%	13.6%	13.4%	21.7%	26.6%	23.3%	20.7%	20.7%	18.86%

Source: Based on data received from KALRO and Ministry of Agriculture, Livestock, Fisheries, and Irrigation.

4.31 The establishment of KALRO and the creation of a well-coordinated system driven by a common vision and goal is expected to make the national research system "more dynamic, innovative, responsive, and accountable." (KALRO 2017) More time and evidence are needed to determine whether KALRO will be able to deliver this outcome. However, the reform process and the uncertain funding situation has been challenging and affected the research and outreach activities. KALRO continued to be highly dependent on government and external funding (World Bank 2016, 29) for financing its research and has not yet established a sustainable funding mechanism for the NARS. The allocation of government budget to KALRO declined initially despite the addition of three commodity research institutes in 2013. Compared with 2011/12 before the merger, the budget allocated for 2012/13–2015/16 has declined by about 15 percent on average. However, this seems to have recovered after 2016/17 with a significant increase in 2017/18 (table 4.5).

4.32 KALRO was also able to increase the size of its development budget generated internally from K Sh 0.38 billion in 2011/12 to K Sh 0.88 billion in 2017/18. This represents a change from 11 percent of the government budget in 2011/12 to about 21 percent in 2017/18. As the share of the total development budget, the internally generated revenue reached about 20 percent at the close of the project and remains at the same level today.

4.33 Data provided by KALRO indicate that a number of technologies and innovations were developed, such as new varieties and improved management technologies that responded directly to the need for productivity improvements, including cereals (54), grain legumes (11), roots, tubers, and oil crops (27), fruits and vegetables (25), animal production (15), health (13), biotechnology (5), and natural

resource management (4). This has exceeded the poorly defined target of 82 "technologies and innovations" (see appendix I).[62]

Output 1c: Support to Agricultural Extension

4.34 Farmers were trained and organized into common interest groups (CIGs) based on identified value chains. The project supported 223,971 smallholder farmer beneficiaries organized into 6,401 CIGs, showing that outreach fell short of the target of 400,000 beneficiaries (World Bank 2016, viii). In addition, CIGs received funds to pay for private advisory service providers or in some cases to purchase equipment for their cooperatives (for example, milk coolers and honey-processing machines).

4.35 KAPAP provided ICT support to the Agricultural Information Resource Center (AIRC), including hardware equipment, software, content (text, graphics, audio, and video); and skills to manage the ICT equipment. The broadband Internet connectivity enabled easy online access to the created content and allowed AIRC to migrate information from analogue to high-definition digital broadcast for quality video production. However, similar support envisaged to create County Agricultural Information Resource Centers (CAIRCs) did not materialize (World Bank 2016, 32).[63] The project also did not establish physical information desks at division (target: 236) and location levels (target: 472), which were expected to be linked to the CAIRCs. More cost-effective options, including radio, television, bulk SMS, posters, and so on were preferred.

4.36 Some important activities envisaged at appraisal were not fully implemented. Strengthening the sectorwide coordination of agricultural extension services under the National Agricultural Sector Extension Policy Implementation Framework (drafted in 2007) within line ministries was not carried out.[64] The project also did not develop the sustainable financing mechanism for demand-driven agricultural support service under the contracted extension service delivery model (CESD) because of excessive focus on service providers rather than farmers. In addition, the project was not able to establish a regulatory framework and quality standards for farmer demand-driven agricultural service delivery (World Bank 2016, 31–32).

4.37 The CESD approach relied on full payments made by the project for provision of services by private service providers to CIGs. Although some studies suggested that farmers would be willing to pay for extension services, no such cost-sharing arrangement with the CIGs was piloted.[65] Full payment for CESD by the project made sense at the start to introduce the approach, but the design could have considered some form of cost sharing before the end of the project. Alternatively, this could have been piloted simultaneously at a small scale to generate the necessary evidence about the feasibility of the approach.

4.38 This lost opportunity has made it difficult to assess the overall viability of the approach after the end of the project, which requires the willingness of the farmers and the CIGs to pick up the costs and pay for contracted services introduced by the project. The IEG field visits to selected counties and CIGs confirmed that many of the beneficiaries are unable to sustain the CESD model except for certain profitable enterprises (for example, dairy and high-value fruits and vegetables). In addition, the devolution of extension services to the counties has led to substantial decline in government support provided to extension and the agriculture sector (except in some counties such as Makueni; see appendix K, table K.2). The public extension service currently suffers from multiple problems, including shortage of trained personnel, aging and poorly motivated staff, limited mobility, and scarce resources to cover operational costs. Because of a freeze in recruitment of extension staff for a long time, the counties visited are not recruiting active extension staff to replace the aging pool, which has left field activities.

4.39 Many of the private service providers that mushroomed during the project years when finance was available to pay for the services have also gradually withered away after the end of the project, leaving an important vacuum as the public extension system also declined. The demand-driven pluralistic extension system envisioned under NASEP did not fully materialize, despite the potential and opportunities in some value chains. Except for some enterprises where the farmers have the economic incentive to pay for the services, there is high uncertainty that the CIGs and cooperatives are able to pay for service providers to efficiently help smallholders to increase their productivity. This underpins the continuing and complementary role of the public extension service in the process of building a pluralistic and demand-driven extension system. Integrating the CESD approach into the extension system will require the counties to support the small-scale farmers and enterprises which currently are not able to pay for private extension services and further strengthen the cooperatives and producer groups currently struggling and facing imminent collapse. This will require the counties to increase allocation of resources to agriculture and find ways to enhance synergies between the public and private extension services. The regulatory frameworks and quality standards for demand-driven agricultural service delivery which were not undertaken by the project will facilitate this process.

Outcomes

4.40 The PDO indicator was that the average yields of selected agricultural products in smallholder farming systems would grow from 3 percent at baseline to 7 percent a year as a result of enhanced research and extension efforts. The final impact evaluation study failed to collect reliable data on the selected products across the target areas. IEG used the Tegemeo baseline survey from target and control sublocations (Tegemeo Institute 2011) and the CESD evaluation study by Egerton University (Government of Kenya 2015c) to establish relatively comparable data. A difference in difference analysis

of this data indicates that, compared with the 2011 baseline, yields for participating farmers in the target areas on average increased by 19 percent for honey, 22 percent for cow milk, 113 percent for fish, but declined by 5 percent for Irish potatoes. Although the endline in the KAPAP impact evaluation crop-specific data were weak, yields also seem to have increased for maize and beans—important food security crops—as well as sorghum and millets (table 4.6). The overall increase in adoption and yields for participating farmers in CIGs compared with nonparticipants was also confirmed from IEG visits and discussions with selected CIGs in the five counties (see appendix J). Despite the variability across value chains and counties, the adoption and yield levels for the selected enterprises are consistently high for participants compared with nonparticipants. The overall diffusion of these technologies, however, remains limited to the target areas and additional effort is needed for scaling up results to wider areas. The impact of KAPAP on yields of major food crops such as maize at the national level remained low or negligible (for example, data from the Food and Agriculture Organization show that maize yields stagnated around 1.75 tons per hectare despite the increase in production from about 2 million to 3.5 million tons primarily owing to expansion in the area harvested from 1.5 million to 2 million hectare since 2000; see figure 4.2).

4.41 In addition, the new varieties, agronomic practices, and innovations developed by KALRO are potentially relevant at the national level. But there is no evidence of diffusion, adoption, and impact of these technologies on the beneficiaries—valuable data and evidence that could have been collected through the socioeconomics unit of KALRO. Research grants also produced some national public goods relevant beyond the project's target districts (see appendix H). However, the envisaged Agricultural Research Fund for enhancing sustainability of funding for agricultural research did not materialize. Similarly, the creation of a sustainable financing mechanism for demand-driven agricultural support services through an Agricultural Development Fund (ADF) was not achieved. The regulatory framework and quality standards for farmer demand-driven agricultural service delivery also was not established.

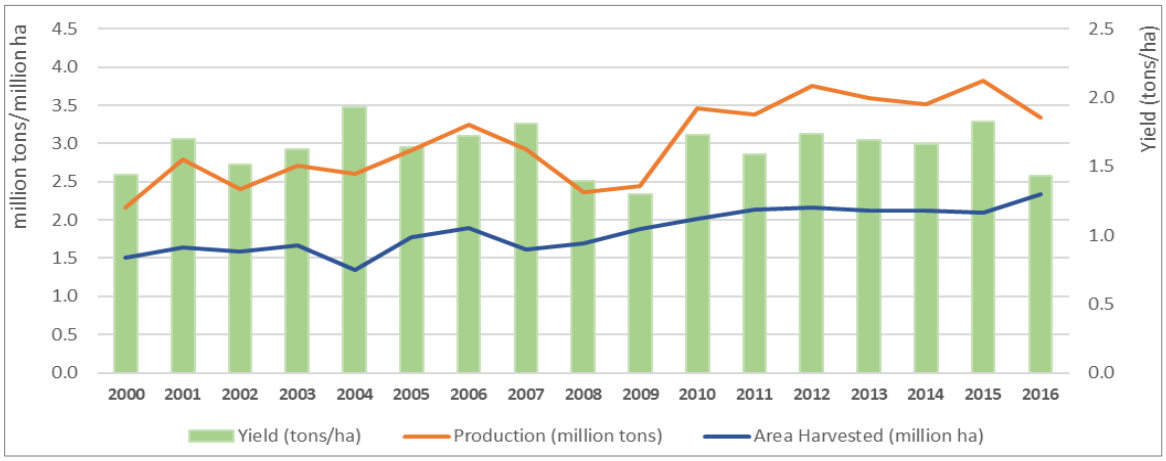
Table 4.6: Crop-Livestock Yield Net Gains from KAPAP Interventions: A Double Difference Comparison

Value Chain	Units	Baseline		Endline		Double Difference	Effect Relative to Baseline (%)
		Treated	Control	Treated	Control	Net Effect	
Apiculture	kg/hive	36	18	52.3	27.5	6.8	18.9
Bananas	kg/ha	3308	1523	13119	-	-	-
Dairy cow	liters/cow/year	1020	1081	3087	2922	226	22.2
Fish	kg/ha	1000	1000	2331	1200	1131	113.1
Local poultry	Kg/farmer	11.4	7.6	46.05	-	-	-
Sorghum	kg/ha	615	1163	4530	2855	2223	361.5
Maize	kg/ha	1710	1675	4329	2703	1591	93.0

Value Chain	Units	Baseline		Endline		Double Difference	Effect Relative to Baseline (%)
		Treated	Control	Treated	Control	Net Effect	
Beans	kg/ha	287	319	1329	946	415	145.0
Millets	kg/ha	675	885	2812	2424	598	89.0
Irish Potato	kg/ha	6620	5130	5335	4179	-334	-5.0

Source: Baseline data from Tegemeo gender disaggregated baseline study (Tegemeo Institute 2011); Endline data from Egerton University's CESD evaluation study (Government of Kenya 2015c).

Figure 4.2: Maize Production and Yield Trends in Kenya



Source: FAOSTAT

4.42 However, similar to KAPP I, KALRO continued to undertake highly diversified research activities covering multiple major and minor crops, livestock production, range management, animal health, biotechnology, and natural resource management. This has led to lack of focus in a few key areas, fragmentation of effort, and several unfinished and terminated activities when the third phase of KAPP did not materialize. Whereas the underlying rationale for the creation of KALRO was to make the national research system more innovative, responsive, and accountable, the socioeconomics research which is central for enhancing the impact orientation and responsiveness of agro-biological research has not received sufficient attention and support. To enhance adoption and use of innovations at the sector and farm levels, the technology development process needs to be informed through deeper analysis, and identification and targeting of client and market needs and priorities. Despite significant research outputs, the research to extension linkage also remains weak and many research products either do not reach farmers or their uptake remains low. This reduces the overall returns from public research investments. With these shortcomings **the efficacy of the first objective is assessed to be substantial**.

Objective 2 - Increase the incomes of participating smallholder farmers in the project area

4.43 The project activities are expected to contribute to this subobjective of increasing farm incomes by improving access to and adoption of agricultural technologies, as well as empowering stakeholders and promoting the development of agribusiness in the target areas. The outputs contributing to yield growth are discussed above. The main outputs related to market and agribusiness development are presented below.

Outputs

Output 2a: Policy and Institutional Support

4.44 The project financed the development of an agribusiness strategy, which was adopted in 2012. In addition, it supported the development of the third livestock master plan and stakeholder consultations for developing the Livestock Strategy and the Beekeeping Bill. The National Aquaculture Strategy and Development Plan (2010–15) and the National Aquaculture Policy were also developed in cooperation with the Food and Agriculture Organization and the European Union (World Bank 2016, 23). However, the review of the Cooperatives Policy was not completed.

Output 2b: Agribusiness and Market Development

4.45 The project strengthened the Kenya National Federation of Agricultural Producers (KENFAP, now KENAFF) by endowing it with reliable Internet connectivity, a heavy-duty server, desktop computers (20) for the regional branch offices, and an interactive website. This allowed the KENFAP to easily update its database and relay other information to regional offices. KENFAP also helped strengthen the emerging cooperatives as well as strengthen regional and national farmers' associations by assisting them in developing their strategic plans (World Bank 2016, 32). The project further supported private contracted service providers engaged in supporting the CIGs to develop business plans for selected value chains. This included support in developing relevant training materials with inputs from different stakeholders, including universities and line ministries (World Bank 2016, 33).

4.46 However, following the midterm review recommendations, some agribusiness development activities envisaged in the PAD were not fully implemented. Agro food parks and agribusiness development centers were not established mainly because they were too ambitious and there was limited prior experience in Kenya.[66] The project instead supported CIGs to form cooperatives to benefit from organized marketing and value addition.[67] In addition, neither the index-based weather insurance products (partial agribusiness risk guarantee fund) nor the agribusiness council/central repository were carried out partly because the former has been piloted in drought-prone areas by other projects in Kenya.

4.47 One innovative aspect of the project that has been implemented partially is the promotion of rural agro-processing activities through off-grid renewable energy. Although the original target was five off-grid renewable energy projects, KAPAP managed to complete two projects: Mbuvo Solar Project in Makueni County and Korkora Solar Project in Garissa County. The first project was intended to serve 580 value chain members (World Bank 2016, 34). The Korkora Project, commissioned in March 2016, is expected to serve 1,200 beneficiaries. These are good examples of providing reliable and affordable off-grid energy for agribusiness development in rural Kenya.

Outcomes

4.48 The agribusiness development component was the key for enhancing the incomes of farmers through better linkages with markets and value-adding activities. Among other indicators, the increase in this subobjective was measured more directly using the PDO indicator on the cumulative increase (above the 2009 level) of incomes of men and women farmers who participated in KAPP I from smallholder agricultural activities. The target set for this indicator was a 35 percent increase for men and 45 percent for women by year five compared with the baseline value of K Sh 130,207 for men and K Sh 78,481 for women. How the income was to be measured and which value chains would be considered was not clarified in the project documents, but IEG sees this as the increase in net incomes (total revenue less variable costs) across the targeted enterprises for smallholder farmers. The other related indicator was the percent increase in earnings of smallholder beneficiaries, measured by the increment of income from all farmers, including those who had not participated in KAPP I. The target set for this indicator was 60 percent increase for both men and women by year five.

4.49 The project impact evaluations have not collected relevant and reliable data to make a meaningful assessment of the achievement of this subobjective. However, the average annual income data from selected value chain products from the impact assessment survey shows that men in all the sampled counties were not able to reach the income target set for end of project and only women livestock beneficiaries in Garissa surpassed the 45 percent target. The worst-performing county for males was Kisii, while Butere Mumias performed poorly for females (Government of Kenya 2015c).[68]

4.50 There is no evidence, however, to support the claim made in the ICR (World Bank 2016) that average income increased by 59.51 percent for male farmers (from K Sh 130,207 to K Sh 207,693) and by 67.94 percent for female farmers (from K Sh 78,481 to K Sh 131,801). On the other hand, focus group interviews during IEG field visits to the sampled CIGs in selected counties indicated that net farm income gains for CIG member participants varied across locations and enterprises but was about 30 percent higher on average compared with nonparticipants (appendix J, table J.3). Although the project's

net income effects are likely to vary across value chains and counties, relevant M&E data were not collected to measure the effect.

4.51 The IEG field study also indicated that only about one-third of the farmer cooperatives were active even if many were operating under capacity, and two-thirds have become dormant after project closing (appendixes K and L). Similarly, about 60 percent of the CIGs were not active after the project closed. This raises significant questions regarding the sustainability of the productivity and income gains resulting from the project. In addition, one of the impact evaluations indicated that about half (49 percent) of the value chains supported by the project posted negative returns (Government of Kenya 2015c). The cases from the field visits, however, suggest that the current status of the cooperatives is related to the level of financial support received from the project. Many of the active cooperatives are those that received core funding for enterprise development, indicating that technical support and payment of the contracted services alone was not sufficient to enhance viability.

4.52 The evidence indicates that the overall increase in net income is limited and many of the enterprises were not economically viable. With these shortcomings, **the efficacy of the second objective is rated modest**.

Efficiency

4.53 **Efficiency of KAPAP is rated substantial, with shortcomings.** The project had several design features that helped deliver the desired outcomes at low cost. First, instead of creating stand-alone entities for project implementation, the project mainstreamed its activities into government structures to reduce administrative overheads (in addition to strengthening ownership and sustainability). Second, agricultural research funds were granted not to individual researchers but to consortia to maximize the use of human and physical capital, and to fast-track technology development. Third, the extension model used the approach of CIGs as entry points to the farming community, which helped lower the cost of intervention per farmer for contracted services. Fourth, the private service providers were paid based on outcomes rather than outputs as agreed with the community. Fifth, project beneficiaries were highly sensitized to engage in the most profitable value chains possible under their circumstances.

4.54 The project, however, suffered from administrative and institutional inefficiency. It was unable to absorb about $16.09 million of project funds, which were eventually cancelled. Financial management was weak. The project effectiveness was delayed because of unresolved phase I financial audit issues, delays in setting up the project's secretariat, and failure by the government to release funds from the designated account to the project account. Project implementation progress was slow and ran behind

schedule by more than 15 months. Throughout its implementation the project also suffered from problems that constrained its ability to disburse funds on time.

4.55 At appraisal, the economic and financial efficiency analysis was carried out to determine the minimal national impact on selected commodities.[69] The *without project* scenario was equated to the average production in 2006–07 from the FAOSTAT database. Assuming a 20-year investment horizon, the financial analysis showed that to obtain a rate of return of 14 percent on the proposed off-farm investment in agricultural research and extension (including components on policy and institutional development and on farmer and stakeholder empowerment), it was sufficient to generate farm yield increase of 0.07 percent every year, or 8.9 percent cumulative net increases in productivity compared with the baseline.[70] The estimation indicated a financial internal rate of return (FIRR) of 84 percent on investment in agribusiness development or NPV of $2.11 billion for 20 years, and economic internal rate of return of 85 percent or NPV of $2.45 billion for 20 years with 14 percent discount rate. Both results suggested the agribusiness component to be an economically and financially viable investment for the country.

4.56 At closing, only financial analysis was performed to determine the return on the investments.[71] Incremental revenue by participating farmers used in the analysis was derived from productivity gain owing to improved technologies, and enhanced access to markets in terms of higher prices owing to organized marketing and value addition. Assuming a 20-year investment horizon, a discount rate of 12 percent and that project participants will maintain their new level of productivity and incomes, the FIRR and NPV were re-estimated at 38 percent and $59.5 million, respectively. Although the internal rates of return and NPV figures are not comparable between appraisal and ICR stage owing to different approaches in investment cost assumptions,[72] the figures are consistent with high rates of return for agricultural research and extension investments estimated in other African countries. Despite an economic and financial efficiency analysis conducted for the agribusiness component at appraisal, no analysis was done for all four project components at closing.

4.57 Nevertheless, sensitivity analysis in the ICR showed that even with a 30 percent drop in farmers' revenue the project would still be viable (FIRR 23 percent). A drop of this magnitude could be triggered by multiple factors (such as adverse weather, input price shocks, and seasonal output price swings). Overall, the project supported a well-diversified array of value chains, which mitigates against (but does not eliminate) the likelihood and impact of an across-the-board revenue drop of a catastrophic magnitude.[73]

Ratings

Outcome

4.58 **The overall outcome for KAPAP is assessed as moderately satisfactory.** Relevance of objectives was rated **substantial** and relevance of design was rated **modest**. Efficacy of the first objective was rated **substantial** but the efficacy of the second objective was rated **modest** owing to limited income growth and weak profitability of value chains. Efficiency was rated **substantial** despite some weaknesses in administrative and institutional efficiency. Consequently, there were moderate shortcomings in the achievement of the project's objectives and in its relevance, leading to an overall outcome rating of **moderately satisfactory.**

Risk to Development Outcome

4.59 **IEG rates risk to development outcome as high.** The main risks did not originate from the exogenous factors such as adverse weather conditions (identified at ICR stage) that affect the productivity gains and incomes to smallholder farmers. The main risks to development outcomes are associated with the difficulties of scaling up the promising pilots and the main institutional reforms introduced and tested through the two phases of KAPP. The key among these is the "domestication" of NASEP and its implementation framework which was developed under the centralized system of government to be strongly aligned with the devolved system whereby the new county governments assume the mandate for agriculture-related rural services including extension and animal health. The role of the national government is now confined to policy formulation, research, and general regulation of the sector. The NASEP approach for development of a demand-driven, responsive, and pluralistic agricultural extension system to enhance the delivery of services to smallholder farmers is seriously diminished by the disconnection and weak coordination between the national and local agencies in implementing NASEP at the county level.

4.60 The viability and sustainability of the CESD model, which was piloted through KAPAP as the flagship approach, also remains uncertain. The IEG field visits to selected counties and CIGs confirmed that many of the beneficiaries are unable to sustain the CESD model except for certain profitable enterprises (such as dairy, honey, and fruits and vegetables). Many of the private service providers that flourished during the project years were not also sustained after the end of the project when the funds that financed private sector services dried up. IEG visits to the five counties indicated that following the fall in demand only about a third of the private service providers seem to be active. With the exception of a few enterprises where the farmers have the incentive to pay for extension services, it seems therefore unlikely that the CIGs and cooperatives would be able to pay for private service providers. The CESD approach will also require establishing regulatory frameworks and quality standards for private service providers.

4.61 The viability and sustainability of some of the core farmer institutions that the project supported for empowering smallholder producers and facilitating commercialization of agriculture also face high risks. The IEG field study indicated that only about one-third of the farmer cooperatives were active, even if many were operating under capacity, and two-thirds have become dormant after the project closing (appendixes K and L). Similarly, about 60 percent of the CIGs were not active. The freeze in the recruitment of public extension officers and weak attention accorded to investments in agriculture at the county level (with some exceptions) has handicapped succession planning in the extension service. The profit-oriented private providers generally favor high potential areas where farmers have the capacity to pay for services, while poor farmers in low potential areas and those producing low value products remain underserved. Kenya has not yet attained the African commitment as part of the Maputo Declaration to allocate about 10 percent of the national budget to agriculture.[74] Whereas the government budget for the core agriculture line ministries has grown in nominal terms over the past decade, the share of agriculture (in terms of allocations to the core ministries) remains low and has declined relative to the situation before the devolution, that is from 3.3 percent before 2013/14 to 2.5 percent after this period (table 4.7).

Table 4.7: Budget Allocation to Agriculture

YEAR	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	Average
Total government budget (K Sh, billions)	789.36	922.56	1,165.53	1,459.90	1,600.00	1,700.00	1,530.00	1,768.45	2,640	1,508
Core sector ministries (K Sh, billions)	27.94	36.72	37.41	38.8	37.51	39.15	40.56	49.96	56.8	42.1
Share of core ministries	3.54%	3.98%	3.21%	2.66%	2.34%	2.30%	2.65%	2.83%	2.15%	2.77%
Growth rate for core ministries		31.42%	1.88%	3.72%	-3.32%	4.37%	3.60%	23.18%	13.69%	9.82%

Source: Based on data provided by MOAFLI (July and August 2018).
Note: The composition of the core line ministries in Kenya has changed over time. In March 2013, the Ministry of Agriculture, Ministry of Livestock Development, and the Ministry of Fisheries Development were merged into one Ministry of Agriculture, Livestock, and Fisheries. Irrigation was also added later under the same ministry.

Bank Performance

Quality at Entry

4.62 **Quality at entry is rated moderately unsatisfactory.** The design benefited from the experience and lessons from the first phase in terms of coordination with other government programs and building capacity. The design of the first three components was similar to those in the first phase of the APL. However, the fourth component, agribusiness and market development, despite its innovative aspects, lacked critical

analytical work to underpin the ambitious design and sequencing of activities. This led to the cancellation of some important subcomponents, including agro food parks, agribusiness development centers, and a partial agribusiness risk guarantee fund, and the scaling back of off-grid energy subprojects following the midterm review. The weakness in financial management that was a key challenge in phase I also persisted under phase II; the mitigation measures identified at the appraisal stage were not successful in mitigating this risk during implementation.

Quality of Supervision

4.63 **Supervision is rated moderately unsatisfactory**. The project benefited from having the World Bank task team leader in the country office but there was a high turnover in the task team leaders. Although regular supervision produced action plans that guided implementation, it suffered from some major shortcomings. First, the cancellation of $16.1 million of project funds led to activities being dropped late into the project. Second, M&E suffered from serious weaknesses at the design and implementation stages. The commissioned impact evaluation failed to build on the baseline sample and methodology to collect relevant data.[75] The analysis also suffered from severe methodological weaknesses and did not produce valuable evidence on the key PDO indicators, including yields and net income changes for the selected enterprises. Although this was primarily an implementation issue, timely supervision and technical advice from the World Bank project team based in Nairobi could have prevented this loss. Third, there were deficiencies in providing regular financial management and procurement support to the government and the project secretariat to avoid ineligible expenditures.

4.64 **Overall Bank performance is rated moderately unsatisfactory**.

Borrower Performance

Government Performance

4.65 Government performance is rated **moderately unsatisfactory.** As in phase I, the government provided strong support as evidenced by adoption of a series of policy reforms for revitalizing agriculture and making extension responsive, pluralistic, and demand driven. The government also maintained support for the project secretariat throughout the project's life, including key project staffing and office space. However, the project suffered from a slow start and from the transition into the devolved structure, mandated by the new constitution (2010) and the reconstitution of the Ministry of Agriculture—necessitating changes in the institutional arrangements for implementing the project. The government was slow in resolving issues that delayed project effectiveness and the complex treasury procedures that affected the release funds, leading to cancelation of $16.09 million of project funds. The counterpart funding ($3.79 million) was only 27 percent of the amount committed at appraisal. In addition,

local government ownership and commitment to achieving development objectives declined following the devolution. After project closing, the county governments (with some exceptions) have not shown strong commitment to revitalizing extension and improving productivity of smallholder agriculture. Financial management suffered from severe weaknesses in tracking disbursements and the final audit found K Sh 167,563,754 ($1.675 million) of residual ineligible expenditures that was refunded to the World Bank.

Implementing Agency Performance

4.66 Implementing agency performance is rated **moderately unsatisfactory.** Internal capacity weaknesses in project and financial management persisted throughout implementation. Some important activities were either not completed or were rushed toward the end to meet the closing date. For example, IEG discussions with key implementing partners clearly indicated that many of the cooperatives were established before the groups were ready to organize and form cooperative societies. This implies that at least some of the cooperatives were registered prematurely before the CIGs were ready to formalize the association through a demand-driven and bottom-up process of change and empowerment. This has reduced the sense of ownership and affected the viability of many of the cooperatives, and several have regressed to operating just as CIGs. The wider geographic coverage of the primary cooperatives also contributed to lack of strong social capital and trust.

4.67 Similar to phase I, the research by KARI/KALRO lacked focus and strategic direction, with the fragmented effort leading to numerous startups and unfinished tasks. The weak research-to-extension system also failed to produce visible national impacts on key food security crops (for example, on maize productivity, which remains one of the lowest in the region). In addition, despite the project having a full-time M&E specialist, the M&E system was not fully rolled out and failed to track essential project performance indicators. In addition, the impact evaluation was methodologically flawed and did not build from the well-conceived baselines which started in phase I to collect valid and relevant data, rendering the M&E system ineffective, despite the significant resources used.

4.68 **Overall, borrower performance was moderately unsatisfactory.**

Monitoring and Evaluation

4.69 **The overall M&E quality rating is modest.** The M&E design had significant deficiencies, including ambitious interest in developing a sectorwide M&E system. The design difficulties further affected the implementation of the project's M&E framework, and the final impact evaluation suffered methodological weaknesses and failed to collect data on the key indicators. In addition, there was very limited evidence of use of the M&E system for project management.

M&E Design

4.70 The project aimed to support the development of two types of M&E systems: (i) a harmonized, sectorwide M&E system for the entire agricultural sector at the national level, and (ii) the project-specific M&E system, supporting project-specific M&E—linked to the project's MIS. The harmonized and sectorwide M&E system, inherited from phase I, was highly unrealistic and ambitious. The project's own M&E system was inadequate and suffered from poor design, including definition of SMART indicators to measure the progress toward measuring the PDO and the intermediate outcomes. Despite the relatively simple PDO, the design included six different indicators to measure changes in yields and income, but many lacked clear definition or were difficult to measure or monitor. The PDO, defined in terms of yields and income, was too narrow for the complex and multidimensional project and failed to capture the salient outcomes in terms of enhanced institutional capacity, efficiency and knowledge development, and farmer empowerment.

M&E Implementation

4.71 The implementation of the project's M&E framework faced significant shortcomings. First, the MIS was operationalized almost two years after the project start-up, leading to inadequate capture of initial baseline conditions. Second, similar to KAPP I, there was a disconnection between the well-conceived and gender-disaggregated baseline and the final survey, which significantly diminished the quality of the impact evaluation and the evidence base needed to demonstrate development outcomes. Although the M&E framework implemented a well-conceived baseline data collection, including both beneficiaries and nonbeneficiaries, the value of this data was diminished when the final impact evaluation commissioned by the project failed to capitalize on the unique data collected starting in phase I by Tegemeo Institute. Third, the MIS was not properly configured to, for example, aggregate summary data at the national level for common value chains collected from various counties. Fourth, monitoring data from farmers suffered from inconsistency and poor reporting by some counties. Finally, despite some effort, the plan to develop the harmonized and sectorwide M&E system stalled when the ASCU was dissolved in 2012 and the line ministries were restructured by the new government after the 2013 elections leading to the establishment of a consolidated Ministry of Agriculture, Livestock and Fisheries.

M&E Use

4.72 As reported in the ICR (World Bank 2017, para 37) the "use of the M&E system for project management purposes was limited." The M&E design and implementation suffered from weaknesses as noted above. The ICR itself relied mostly on information and data from the project's final impact assessment which had its own deficiencies. The shortcomings and inconsistencies in the M&E system created limitations when comparing baseline and endline data in the impact assessment. Despite the complexity

of the design and potential to engage strong agencies to implement a rigorous M&E system, the project's MIS failed to inform or shape critical management and implementation decisions.

5. Lessons

The following lessons are drawn from the experience of the KAPP program.

Sustained government ownership and commitment are key to achieve complex and sectorwide institutional reforms. KAPP sought to improve sector performance by undertaking complex policy and institutional reforms in research and extension along with changes in the underlying legal and regulatory frameworks. KAPP was a pioneer in the effort to revitalize the largely ineffective and public-sector-dominated research and extension systems through reforms to introduce demand-driven and pluralistic approaches. Despite the challenges of sectorwide coordination and fundamental changes in sector governance, sustained government ownership and commitment to improving the efficiency of the agricultural sector can result in substantive reforms in the national agricultural research and extension systems.

Effectiveness of institutional reforms and project outcomes requires sustained effort through continuous realignment with the changing context. KAPP supported significant policy and institutional reforms, but it faced challenges in sustaining the implementation of these reforms through the devolution of power and resources to county administrations. The devolution provided significant powers and responsibilities for the agricultural sector to the counties and enhanced local ownership, but the lack of local capacity, unclear priorities for agriculture, and weak coordination and alignment with the new setting affected implementation and effectiveness of the extension reforms, including the sustainability of the cooperatives and farmer common interest groups. The long-term effectiveness of institutional reforms depends on sustained effort, capacity building, and continuous realignment to new conditions.

Participatory and client-driven approaches with strong priority setting and regular evaluation are critical to stimulate and transform the agricultural research system. A conclusion from this project is that considerable effort is needed to make agricultural research more responsive, demand-driven, inclusive, and effective in developing technologies and stimulating uptake by its clients. KAPP resources were used to support a wide range of core and new research initiatives but it led to fragmentation of effort and the proliferation of small-scale activities. Agricultural research can benefit from a mechanism that clearly articulates priorities from the demand side, as a basis for research planning, and from effective instruments that connect research with extension.

Provision of agricultural extension services to poor small-scale farmers as a public good requires a sustainable financing mechanism. The public good characteristics of agricultural research and extension in Kenya continue to offer the rationale for public sector participation in both. KAPP's approach was to introduce pluralism into the extension system by supporting public funding of a private sector fee-for-service delivery model. The public sector played a leading role when the private sector lacked an incentive to provide extension services to poor farmers unable to pay for such services. Although this model worked well when project financing was available it was not sustained after the project closed. Public funding complemented by cost-sharing with farmers tied to marketing of surplus produce—through cooperatives or farmer groups—may contribute to bolstering funding arrangements for agricultural extension to poor small-scale farmers.

Public sector funding for extension services can be decoupled from public provision to strengthen complementarities and create space for private sector participation and improved service delivery. KAPP piloted the contracting of private providers using farmer grants and demonstrated that the public sector can engage and deliver extension services using private providers. This is more justified in areas where the private sector lacks the motivation to deliver such paid services without public support. Public funding can be decoupled from public provision to provide contracted services to small-scale farmers, which creates space for a more efficient delivery of services using the private sector and contributes to strengthening complementarities between the public and private extension systems.

Scaling up the contracted service delivery model using the privatized extension system requires development of new public regulatory and quality control systems. The KAPP experience shows that contracted extension service delivery by private fee-for-service extension is viable for market-oriented, high-value products (such as dairy) where farmers' net benefits are higher than the cost of accessing such services. However, it was not possible to scale up this model without the development of new public regulatory systems that ensure high-quality technical content of private fee-for-service extension.

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[1] During the same period, about 64 percent of the total population was in rural areas. The survey further revealed extreme poverty, with 3.9 million people—of which 3.2 million were in rural areas— who struggled to live in conditions of abject poverty and were unable to afford the minimum required food consumption basket. Overall poverty refers to households and individuals whose monthly adult equivalent

total consumption expenditure per person is less than K Sh 3,252 in rural and periurban areas, and less than K Sh 5,995 in core urban areas. Extreme poverty refers to households and individuals whose monthly adult equivalent total food and nonfood consumption expenditure per person is less than K Sh 1,954 in rural and periurban areas, and less than K Sh 2,551 in core urban areas (KNBS 2018).

[2] The core agriculture sector encompasses crops, livestock, and fisheries-related economic activities. More broadly the sector also includes institutions involved in land and water management, cooperatives, environment, forestry, and regional development, including development of arid and semiarid lands.

[3] There is a wide literature on agricultural extension and reforms, including contracted extension services (see Umali 1997; Davis and Place 2003; Feder, Birner, and Anderson 2011; and Kidane and Haggblade 2016). The evaluation benefited from review of the existing literature.

[4] The Ministry of Agriculture, Livestock and Fisheries was formed through Executive Order No. 2/2013 of May 20, 2013. It comprises three state departments, namely Agriculture; Livestock, and Fisheries which had been separate line ministries since 2008. In 2015, the Department of Irrigation Technology and Infrastructure under the State Department of Agriculture was transferred to the newly established Ministry of Water and Irrigation, but later returned as a separate State Department for Irrigation under the Ministry of Agriculture, Livestock, Fisheries and Irrigation. In 2013, by act of parliament, KARI merged with the Coffee Research Foundation, the Tea Research Foundation, and the Kenya Sugar Research Foundation to form the Kenya Agricultural and Livestock Research Organization (KALRO). Overseeing 16 research institutes, KALRO is the premier national institution bringing together research programs in food crops, horticultural and industrial crops, livestock and range management, land and water management, and socioeconomics.

[5] World Bank management agreed to a reallocation of the IDA credit and IDA grant funds on June 6, 2008. The project was provided a 12-month extension based on the midterm review to make up for the delays in implementation progress, inadequate flow of funds, and inadequate counterpart government funds in the first year.

[6] The agriculture line ministries had overall responsibility for project oversight through the ICC. While KARI retained the ultimate fiduciary responsibility for KAPP I, some fiduciary responsibility was passed on to the KAPP Secretariat at the central level, and to the DSUs at the district/local level as they develop some capacity.

[7] The membership of the KAPP Steering Committee (KSC) in phase I was composed of the directors of KARI, National Environmental Management Authority (NEMA), Veterinary Services, Livestock and Agriculture, Fisheries, representatives of Kenya National Federation of Agricultural Producers (KENFAP), and representatives of the Ministries of Cooperative Development, Ministry of Natural Resources and Wildlife Management, Ministry of Finance, civil society, NGOs and community-based organizations.

[8] The ASPSC comprised 13 nominees of the ministries represented in the ICC, representatives from Ministries of Finance, Trade, Energy, Industrialization and Roads, the director of KARI, and senior officials representing the private sector, universities, and NGOs.

[9] The ASPSC was responsible for approving (i) work program proposals for applied research, extension and empowerment, agribusiness and investment projects, including the oversight of microprojects planned and implemented at the regional level; (ii) the annual work plans and budgets of investment projects (such as KAPAP), before recommending their endorsement by the ICC; (iii) monitoring of the implementation progress of investment projects; and (iv) reviewing and making recommendations on proposed policy changes to the ICC.

[10] The KAPP Secretariat was staffed by professionals, selected through an open and competitive process and seconded from the line ministries for the duration of the project. Staff performance was evaluated at midterm. Confirmation of appointment of all technical staff was subject to review and approval by the World Bank.

[11] This later expanded to four entities when the Ministry of Fisheries Development and Ministry of Livestock Development became separate entities in 2008. Presidential Circular No. 1 (2008) elevated the department to a Ministry of Fisheries Development and placed the Kenya Marine and Fisheries Research Institute in the new ministry.

[12] Although KARI retained the ultimate responsibility for project financial management and procurement for the duration of KAPP I, it gradually built financial and procurement capacity within the KAPP Secretariat and other implementing institutions and gradually devolved responsibility to them by the end of phase I. Initially, disbursements were made on the basis of statements of expenditures, direct payment, and special commitments, while the transition to report-based disbursements and financial management reporting (FMR) was progressively introduced and became effective by the end of phase I. The KAPP Secretariat was also responsible for managing the consultative processes, and coordinating the information, monitoring, evaluation, and analytical input into those processes, information communication and public relations associated with KAPP and KAPAP. Except for specific activities that will be undertaken by other implementing agencies (for example, policy studies), the secretariat was responsible for facilitating and coordinating the implementation of the project with the other implementing agencies.

[13] Each DSU was staffed with at least two professionals, a district coordinator, a monitoring and evaluation specialist, and a supporting accountant, secretary, and driver.

[14] These were the Ministries of Agriculture, Livestock Development, Fisheries Development, Cooperative Development and Marketing, KARI, and KENFAP. Although the KAPP Secretariat formally held responsibility for implementation of the NARS component, KARI/KALRO retained responsibility for the KARI/KALRO subcomponent. The fiduciary responsibility for KAPAP was vested initially with the Ministry of Agriculture, which later in 2013 became the Ministry of Agriculture, Livestock and Fisheries.

[15] Triggers for moving from the first into the second phase include (i) a national extension policy and related institutional and implementation framework approved by the government; (ii) two cycles of project monitoring and evaluation completed, with at least 85 percent of the district intervention impacts evaluated; and (iii) at least 60 percent of the Kenya Agricultural Research Institute (KARI) component implemented and evaluated as satisfactory.

[16] The PAD further elaborates the means to include the following: "(a) reforms in extension to increase pluralism, responsiveness to clients and participation by private providers; (b) an evolutionary change in the existing system of agricultural research to improve accountability and impact; and (c) increased empowerment of producer organizations to influence the planning, design, implementation, funding and monitoring and evaluation of research, extension, training and capacity building activities." The project was extended for 12 months following the midterm review to make up for the delays in implementation progress and inadequate flow of funds and inadequate counterpart funds in the first year.

[17] Among these were (i) incorporation of the National Agricultural Research Project, Phase II's competitive grants under a new KAPP I research grant facility; (ii) the requirement that Agricultural Technology and Information Response Initiative (ATIRI) collaborate in local farmers' forums to ensure the responsiveness of research proposals to farmers' demands; (iii) the requirement that all new research proposals include a dissemination strategy; and (iv) following the experience of the Arid Lands Resource Management Project in Kenya, steps to mainstream the activities of KAPP I's newly created DSUs by linking them to existing district bodies.

[18] The KAPP I KPIs included: (i) NARS action plan adopted in year two and implementation initiated by year three; (ii) collaborative activities occupy 50 percent of project financing to non-KARI research institutes; (iii) inventory of KARI technologies and institutional capabilities carried out and database developed by end of year one, and updated annually thereafter; (iv) progressive devolution of KARI resource allocation and accountability for adaptive research programs to centers and center research advisory committees; (v) six extension approaches tested and proven cost effective; (vi) 20 client forums created and functioning at district and divisional levels; and (vii) 40 producer organizations investing in technology multiplication.

[19] This follows from the Sector Social and Environmental Assessment (SESA) which was conducted during the design stage to lay out the steps for mainstreaming environmental and social issues into the three phases of the KAPP.

[20] High financial management risks were identified owing to a weak control and low capacity environment of the existing government system, to potential delay in allocation of counterpart funds, government delay in submission of audited accounts, and lack of KAPP Secretariat experience handling World Bank–financed projects. To address these concerns, a number of project-specific risk mitigation arrangements were proposed in the project design. These include the creation of an Inter-Ministerial Steering Committee to be responsible for overall project implementation supervision, monitoring and reporting, institutional arrangements to place all fiduciary responsibility with KARI, and the subcontracting of an independent annual audit to a private firm of auditors who will report to the Controller and Auditor General (CAG).

[21] These included a plan for a stand-alone accounting system, including hiring of a consulting firm to do capacity building for KARI and the project secretariat; streamlining of disbursements to district units and research centers; and strengthening of oversight and internal audit functions by the project steering committee. The lessons learned have been incorporated in the second phase of the APL.

[22] The IEG mission and field visits to selected counties indicate that the initial activity under KAPP I was the piloting of selected approaches for delivering pluralistic extension services which were piloted in four locations in each district. After the piloting of the extension models, four value chains were selected in each county initially through a participatory approach that enabled farmers in each location to select their priority enterprises (commodity value chains). KAPP I then supported the establishment of three CIGs for each of the selected value chains to facilitate access to demand-driven extension services, new technologies, and agribusiness services using contracted service providers and empowerment of producer organizations. This was undertaken in tandem with the macro level policy and institutional reforms in research and extension systems.

[23] Under industrial and horticulture crops alone the research covered: vegetables (tomatoes, French beans, African leafy vegetables, herbs and spices, medicinal plants); aromatic plants (aloe, vanilla, moringa); fruits (bananas, passion fruits, avocado, papaya, mangoes, citrus); flowers (lilies, gladiolus, tulip, moby dick, anthurium); nuts (macadamia, cashew, groundnuts); industrial crops (pyrethrum, cotton); and oil crops (sunflower, soya beans, safflower, castor, jatropha, oil palms). The program developed partnerships with other stakeholders such as international universities, private institutions, international agricultural research centers, NGOs and community-based organizations through memoranda of understanding (MoUs) and letters of agreement (World Bank 2010a, 26).

[24] The ICR indicated that only two KARI centers (Molo and Perkerra) and a subcenter (Matuga) were included in the ATIRI activities (World Bank 2009a, para 18).

[25] Under KAPP, it was expected that ATIRI would be modified to be the main means for planning, implementing, monitoring and evaluation of farmer demand-driven activities. ATIRI was also expected to contribute to capacity building and empowerment of farmer groups. The anticipated ATIRI operational modalities were, however, not effected during phase I. Under phase II, ATIRI was devolved into an outreach and partnership program (World Bank 2009a).

[26] The ICR-KAPP I (World Bank 2009a, 22) reported that farmers in the North Eastern province who are largely pastoralists favored a multidisciplinary pastoralist approach. In the Coast province, the farming systems approach for technology and development and transfer which allows farmer-to-farmer learning was more popular.

[27] The three indicators were (i) increased uptake of technologies and practices; (ii) integrated research and extension policy and institutional framework in place by 2007; and (iii) pilot activities in 20 districts testing pluralistic extension approaches and supporting client empowerment. The second and third indicators are formulated more as outputs and do not directly capture the outcomes in terms of effects or behavior changes that follow from policy and institutional reforms. Since KAPP was implemented in two phases, the

long-term impacts of KAPP I also form part of the impacts of KAPAP. For farmers who benefited from the two phases, the impacts are difficult to isolate, and the project's M&E framework was not designed to capture the contribution of the first phase to the total impacts of KAPP.

[28] KAPP I intended to support KARI in reducing this dependence and set up the Agricultural Research Investment Services (ARIS) as a subsidiary private company for internal income generation. Although the draft legal instruments and business plan for ARIS were developed, they were not finalized and approved. However, KARI initiated some ARIS pilot activities in some KARI centers (such as commercializing KARI's surplus farm resources, laboratory and analytical services) but ARIS could not be established without the legal mechanism.

[29] The sample size was drastically reduced to 800 households but maintained the original distribution into target and control groups. The well-designed baseline survey implemented by the Tegemeo Institute covered 15 out of the 20 pilot districts stratified into 8 agro-regional zones and was carried out from July to September 2006. The baseline collected data from 2,027 households, 60 percent (1,202) in target areas and 40 percent (825) in control areas within the same districts. Given the wide geographical area and sectorwide interventions of KAPP I, this is likely to reduce the level of precision in estimating the adoption effects of the project despite the substantive baseline data collected which remained largely underutilized.

[30] Difference-in-difference is a useful technique to use when randomization on the individual level is not possible. The method requires data from pre- and post-intervention, such as cohort or panel data (individual-level data over time) or repeated cross-sectional data (individual or group level). The approach removes biases in post-intervention period comparisons between the treatment and control group that could be the result from permanent differences between those groups, as well as biases from comparisons over time in the treatment group that could be the result of trends owing to other causes of the outcome (Wooldridge 2013).

[31] This indicates that even if adoption in the target areas increased only by 3.3 percent, the net increase considering the decline in adoption by the same percentage in the control areas, the overall effect of the project is higher than the change in the target areas (also showing the value of a control comparison group).

[32] For better accountability, it would be useful for project design to consider as part of its PDO and outcome indicators the real changes that could be directly attributed to the intervention.

[33] The EDPs were introduced in two cycles in the 20 districts and 80 divisions targeted by KAPP I. The EDPs included fish farming, vegetables, intensive dairy, and snow peas. The EDPs introduced new activities that were considered to be economically and financially viable.

[34] This was also to allow for sufficient time to develop and release the research product, and the time taken by the farmers to progressively adopt the new technology. The analysis used farm models, which were fed with average price, input, output, and adoption rate data from the rural household baseline survey (2006) and the technology adoption survey (2008). Yields for previous years (2005–07) were calculated by interpolation techniques or linear regressions.

[35] Quantifiable benefits included (i) increased yields owing to the uptake by farmers of KARI's new technologies; (ii) improved adoption of chemical fertilizer on maize; (iii) improved agricultural practices; (iv) enhancement of agricultural research and development of extension services; and (v) other factors, such as the participation of farmers in formal markets. Nonquantified benefits included (i) increased nonmonetary benefits at the household level; (ii) benefits in terms of rural income and purchasing power; (iii) social benefits in terms of food security and nutrition at the household scale; (iv) environmental protection from soil, water, and environment conservation technologies; and (v) economic externalities (World Bank 2010a, annex 3).

[36] ICR reported 4.6 percent adoption of improved seeds for maize and potato, 3.1 percent improved seeds for mango, 9.4 percent improved dairy cattle breed, compared to the PAD estimated target adoption rate after 20 years of 15 percent, 30 percent, 30 percent, and 10 percent, respectively (World Bank 2010a).

[37] Although careful domestication and continual adjustments are needed to make NASEP better aligned with the devolved structure, several of the institutional changes (such as contracted service delivery and rural cooperatives) and the development outcomes initiated through the project face high risks of not being maintained or sustained (see the section on KAPAP for details).

[38] As the ICR notes, KARI only had limited experience at the time in managing a multisectoral research and development project with community involvement which required setting up of local-level implementation structures (World Bank 2009a, 5).

[39] Both major and minor crops as well as new and nontraditional crops were allocated scarce resources, thereby thinly spreading the effort and making it hard to address the critical challenges that limit productivity growth and improve food security in line with the SRA.

[40] Recognizing the gap in the quality of the M&E system, the project team modified the results framework in August 2006 to clarify targets and improve measurability although these indicators remained focused on outputs. The amendment was not formally approved by the World Bank and thus was not used for project assessment (World Bank 2009a).

[41] The 2006 baseline covered 15 of the 20 pilot project districts and sampled a total of 2,027 households. In the 2009 technology adoption survey, number of both districts and households was substantially scaled down to 800 households in 9 districts.

[42] Based on satisfactory progress made under two triggers and moderately satisfactory progress under one trigger, the Kenya Agricultural Productivity and Agribusiness Project (KAPAP—phase II of the APL) was approved by the Executive Directors on June 11, 2009.

[43] Triggers for moving from the second to third phase included (i) the government approved Agricultural Sector Development Strategy (ASDS) 2010–2020 by year 1, prepared an ASDS implementation framework and investment plan in year 2, and its implementation started by the midterm review in year 3 of KAPAP; (ii) the government rolled out the implementation of the National Agricultural Sector Extension Policy (NASEP) and set out the institutional framework for regulation and financing of commercial extension/advisory services by the midterm review in year 3; and (iii) the institutional mechanisms for the implementation of the National Agricultural Research System (NARS) policy were in place by year 2 and the restructuring of the Kenya Agricultural and Livestock Research Organization (KALRO) was completed by the midterm review in year 3 of KAPAP.

[44] The Vision 2030 aimed to boost growth in this sector through enhancing agricultural productivity, extending land use for agricultural production especially in Arid and Semi-Arid Lands (ASALs), strengthening market supply chains, and increasing value addition of agricultural produce (Government of Kenya 2007).

[45] Furthermore, the PDO is in line with the Comprehensive Africa Agricultural Development Program developed by the New Partnership for Africa's Development (NEPAD) of the African Union.

[46] As laid out in the PAD, KAPAP intended to support: (i) improvement of research and extension systems and their linkages to sector priorities through the implementation of ASDS, NASEP, and NARS policies, including improved planning, coordination, funding, and implementation of public agricultural programs aimed at sector transformation, growth, and reduced risk; (ii) empowerment of farmer organizations and other stakeholders to influence planning, design, funding, implementation, and monitoring and evaluation of agricultural research, extension services, training, and capacity building activities; (iii) development of agribusiness along commodity chains aimed at improved value addition and marketing; and (iv) integration and mainstreaming of gender and other crosscutting issues (HIV/AIDS, youth, and environment) throughout the project area and along the value chains.

[47] There were strong links with the Global Environment Facility–supported Kenya Agricultural Productivity and Sustainable Land Management Project (KAPSLMP-P088660).

[48] KAPAP KPIs are set as percentage increase in: (i) average yields of selected agricultural products in smallholder farming systems in the project area; (ii) earnings of men and women from smallholder agricultural activities in the project area; (iii) public investments in the agricultural sector; and (iv) participating men and women smallholder farmers who are satisfied with extension, empowerment, and agribusiness services.

[49] This was needed to clearly capture the target values and the achievements and to include the core indicator and its targets, as well as to standardize the unit of measurement for the relevant indicators to avoid double counting of the beneficiaries.

[50] Each RSU had a mandate to undertake the delegated functions of the KAPP Secretariat: (i) to coordinate, in consultation with the District Development Committees (DDCs), all consultative, planning, and implementation processes at the district and division levels, including micro-projects implemented at the local level; and (ii) to assume monitoring and evaluation, financial management, procurement, and public relations functions.

[51] The RSUs and the Regional Agricultural Sector Steering Committees (RASSSCs) were renamed, respectively, to County Service Units and County Agricultural Sector Steering Committees, in line with the county government structure.

[52] The midterm review mission observed the persisting concern in delays of disbursement with the remaining 41.7 percent of the total credit amount yet to be disbursed for 18 months to the original closing date of December 31, 2014.

[53] In the past year, the number of beneficiaries has increased by 67 percent to over 220,000, significant increases in yields and incomes were recorded among the project beneficiaries, the number of CIGs has almost doubled to more than 4,800, and a total of 85 cooperatives and five companies with a membership of close to 120,000 were registered. The collaborative research supported under the project also made good progress with promising results, which the various industry players have started to adopt, and the KARI research program continued to register good progress, with a total of 185 technologies/varieties/innovations released for use.

[54] Some of the remaining activities included collaborative research activities, expansion of community interventions to include more areas in each county, capacity building for the newly formed cooperatives and other marketing groups, consolidation of farmer empowerment and organization, engagement with the targeted 20 county governments in the operational areas, and ensuring that supported community groups implement and account for the various grants.

[55] Environmental issues identified in KAPAP include (i) loss of natural habitat, (ii) use of inappropriate farming practices, (iii) agriculture/wildlife conflicts, (iv) agro-processing pollution, (v) misuse of pesticides, and (vi) proneness to climatic fluctuations (especially drought). Social issues identified include (i) inability of resource-poor farmers to access extension services and inputs, (ii) inappropriate technology and thus poor adoption, (iii) inadequate access and control of production functions for women, (iv) impact of HIV/AIDS on production systems and livelihoods, and (v) KAPAP activities were envisaged to have longer-term impacts on indigenous peoples indirectly affected by project activities (for example, through change in diet and livestock-related activities).

[56] These frameworks were developed to fully comply with environmental legislations and procedures in Kenya and with the World Bank's environmental and social safeguard policies. Subprojects and community micro-projects were screened according to KAPAP-specific ESMF, IPMF, and IPPF to assess the potential negative impacts that would require attention prior to their implementation in order to adequately address the World Bank's safeguard standards.

[57] The KAPAP-IPPF built upon the IPPF developed under the World Bank–supported Kenya Agricultural Productivity and Sustainable Land Management Project (KAPSLMP). It was based on free, prior, and informed consultations with indigenous peoples undertaken in five phases for the KAPSLMP and made

customized proposals for further free and informed consultants with the indigenous peoples in the KAPAP project (Government of Kenya 2009c). Measures were put in place to (i) avoid potentially adverse effects on the indigenous peoples' communities; or (ii) when avoidance is not feasible, minimize, mitigate, or compensate for such effects; and (iii) ensure that the indigenous peoples receive social and economic benefits that are culturally appropriate and gender- as well as intergenerationally inclusive.

[58] In Nakuru, the indigenous people were engaged in honey production; in West Pokot, they were also engaged in apiculture as well as poultry, dairy, and agroforestry value chains; and in Trans Nzoia, they were involved in apiculture, poultry, and vegetables.

[59] Only about 19 percent of the revised funding (or 14 percent of the original IDA funding) was absorbed by end of FY2012–13.

[60] The FY12 audit report by the Kenya National Audit Office (KENAO) was qualified on the basis of insufficient supporting documents. In November 2014, the World Bank's financial management team carried out another in-depth review for FY13, which identified some ineligible expenditures amounting to K Sh 1.4 billion. In mid-May 2016, the World Bank, in collaboration with the government's Internal Audit Department, initiated a verification exercise to determine the final ineligible amount, if any, to be refunded to the World Bank. Over 50 percent of the expenditures were declared eligible by mid-June 2016. The ICRR noted a statement from the Agriculture Global Practice (AGR GP) on behalf of the task team that: "the Government of Kenya informed the Bank that at the time of an in-depth review of financial management of the KAPAP, funds had just been disbursed to the county governments and other executing agencies."

[61] Under the 2013 Act, the research institutes have a broader mandate to undertake research as well as promote adoption of new technologies and innovations, including (i) to advise on and develop appropriate systems to promote balanced, diversified, and sustained agricultural development and to optimize agricultural production through adaptive and investigative research; and (ii) to facilitate the use of improved production technology, and to establish adequate feedback systems from agricultural producers in order to achieve and maintain national self-sufficiency and export capacities in agricultural products.

[62] The intermediate outcome target was indicated as the number of "technologies and innovations generated that directly respond to women and men smallholder priorities along selected product value chains."

[63] To enhance access to agricultural information to men and women farmers, KAPAP aimed to establish information desks at division (236) and location (472) levels and link them to their respective County Agricultural Information Resource Centers. This was dropped as the project adopted other approaches deemed more cost-effective for providing farmers with information on markets and technologies, including radio, television, bulk SMS, posters, and education tours.

[64] Given the large number of institutions involved, this faced some institutional resistance because of lack of common vision or a lack of champions with the requisite technical and political gravitas (World Bank 2016, 52).

[65] According to one study, about 78.6 percent of the sample farmers in the target areas and 74.7 percent in the control areas are willing to pay for contracted extension services. However, only 10.7 percent in treatment and 7.1 percent in control areas were actually paying for some contracted services (Government of Kenya 2015c).

[66] The agro food parks and agribusiness development centers were dropped following the midterm review, which recommended that the project instead focus on "identifying key agribusiness investment opportunities for value addition to be undertaken at county level from the already developed business plans." In addition, the credit risk partial guarantee was cancelled (World Bank, 2016 33).

[67] Some examples include marketing of onions in West Pokot, processing of honey among the Ogieks in Nakuru, processing of peanut butter by the groundnut value chains in Butere Mumuas and Homa Bay counties, selling rabbit meat in supermarkets in Nakuru, and targeted export markets by the meat value chain in Garissa exporting beef to the United Arab Emirates.

[68] Some project information argues for deliberate underreporting for various reasons; diversion of produce to informal marketing channels and exclusion of home consumption could be the reasons for low income growth. Although this may be valid, underreporting is likely to be the case in the baseline and the value chain income should have captured both home consumption and marketed surplus.

[69] Eleven commodities were identified as priority by the ASARECA-IFPRI study: maize, sorghum, wheat, banana, mango, pulses, poultry, sheep, beef, dairy, and aquaculture (World Bank 2009b).

[70] This was equivalent to 0.44 percent average annual increases in productivity compared with the baseline. In terms of economic values, the required minimum impact is 0.06 percent yield increase every year (or 7.6 percent accumulative increase in productivity over 20 years, or 0.38 percent increase in productivity per year compared with the baseline). The appraisal further performed an economic and financial analysis for indicative enterprise models planned in agribusiness component 4.

[71] The ICR justified the omission of economic efficiency analysis with the consideration that, with the exception of maize, the agricultural market is generally considered to be fairly competitive without significant distortions and most of the agricultural outputs were mainly destined for local markets and thus nontradable (World Bank 2017).

[72] At appraisal, the internal rate of return and NPV were only estimated for component 4, that is, $21.74 million was taken as the only investment costs. The ICR analysis used all the project investments (except the amount spent on feasibility studies for agro food parks whose future implementation was still uncertain) because they all played a role in the observed outcomes (World Bank 2017).

[73] The Evaluation Report on Contracted Extension Service Delivery Model (KAPAP-CSDM) also estimated the cost of implementing the model at K Sh 11,785 for servicing a farmer group and K Sh 353 for an individual farmer. For the resources invested in the model, every shilling generated K Sh 15.2 as estimated from the benefit-cost ratio (BCR), and the initial invested shilling multiplied 14 times as estimated from a return on investment (ROI) of K Sh 1,415.2 net benefits. At closing, the report estimated positive BCR and ROI for 40 percent of the 95 value chains but negative for 49 percent of them. The value chains that created the most wealth were the meats value chain in Garissa County (BCR 373; ROI 37,214), followed by honey in Nakuru (BCR 235; ROI 23,385) and mango in Makueni (BCR 191; ROI 19,008). Some of the worst-performing value chains were poultry and grains in Trans Nzoia, potato in Nyandarua, and cassava in Nakuru (Government of Kenya 2015c).

[74] African heads of state at the Second Ordinary Assembly of African Union, in 2003, in Maputo, Mozambique endorsed a declaration on agriculture in Africa. The so-called Maputo Declaration commits African countries to allocate at least 10 percent of the national budget to agriculture, and to achieve at least 6 percent annual agricultural growth.

[75] The baseline survey for KAPAP (2011) conducted by the Tegemeo Institute was consistent with the KAPP I baseline survey (2006) but this long-term monitoring framework which established valuable data from surveying beneficiaries and nonbeneficiaries in 15 out of 20 counties was dropped when the commissioned impact evaluation for KAPAP (2015) adopted its own new approach, diminishing the value of the existing longitudinal data for measuring the projects' outcomes and impacts.

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Appendix A. Basic Data Sheet

Kenya Agricultural Productivity Project (IDA-39290 IDA-H0980)

P082396

Table A.1 Key Project Data

Financing	Appraisal Estimate *($, millions)*	Actual or Current Estimate *($, millions)*	Actual as Percent of Appraisal Estimate
Total project costs	70.37	78.87	112.1
Loan amount	40.00	42.04	105.1
IDA	27.00	28.34	105.0
IDA grant for poorest countries	13.00	13.70	105.4
Cofinancing	30.37	36.83	121.3
Cancellation	-	-	-

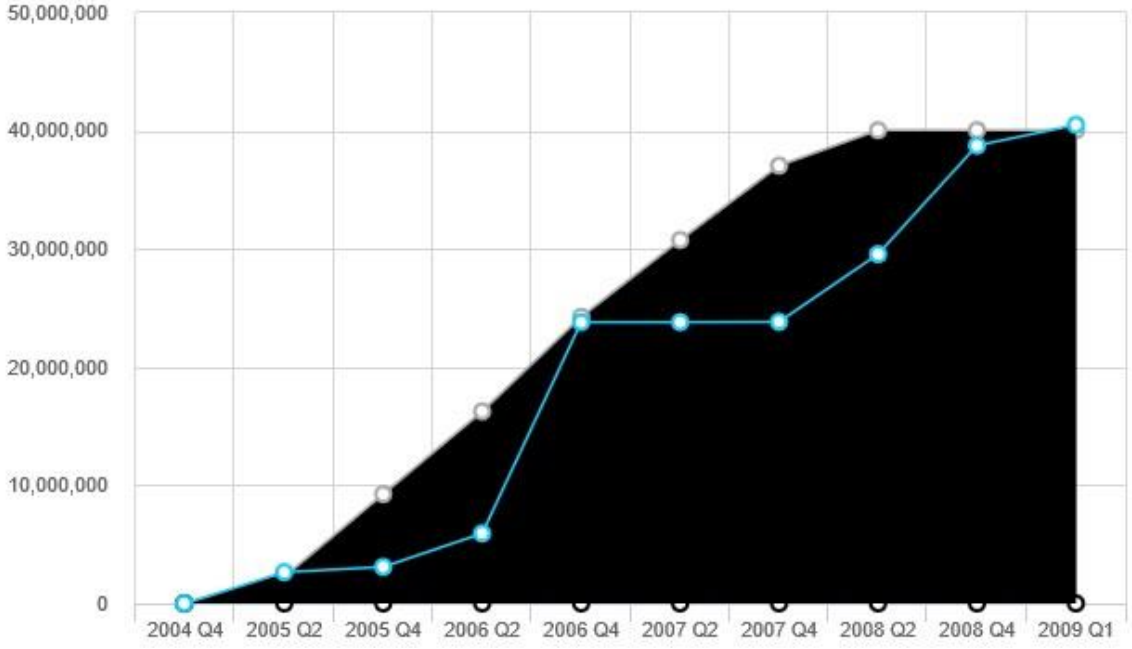
Table A.2 Cumulative Estimated and Actual Disbursements

Disbursements	Appraisal Estimate ($, millions)	Actual ($, millions)	Actual as Percent of Appraisal
2004 Q1	0	0	-
2005 Q2	2,250,000.00	2,642,566.83	117.45
2005 Q4	9,249,999.98	3,086,498.48	33.37
2006 Q2	16,249,999.96	5,926,891.69	36.47
2006 Q4	24,249,999.94	23,800,232.32	98.15
2007 Q2	30,749,999.92	23,800,232.32	77.40
2007 Q4	37,049,999.90	23,800,232.32	64.24
2008 Q2	40,049,999.88	29,555,006.99	73.80
2008 Q4	40,049,999.88	38,748,112.40	96.75
2009 Q1	40,049,999.88	40,500,670.43	101.13

Table A.3 Commitment and Disbursement Summary ($, millions)

Source	Net Commitment	Total Disbursed	Undisbursed	% Disbursed
IDA credit	27.00	28.34	0.00	99.6
IDA grant for the poorest countries	13.00	13.70		104.6
Total	40.00	42.04	0.00	100.01

Figure A.1 Cumulative Estimated and Actual Disbursements ($)



Note: Blue line = actual disbursement; shaded area = estimated disbursement.

Table A.4 Project Dates

Event	Original	Actual
Concept review	10/17/2003	10/17/2003
Appraisal	03/01/2004	06/14/2004
Board approval	06/15/2004	06/17/2004
Signing	06/25/2004	06/25/2004
Effectiveness	10/21/2004	10/21/2004
Closing date	12/31/2007	12/31/2008

Table A.5 Staff Time and Cost

Stage of Project Cycle	World Bank Budget Only	
	Staff Time *(no. weeks)*	Cost[a] *($, thousands)*
Lending		
FY04	42	316.91
FY05	6	7.25
FY06	-	0.00
FY07	-	0.00
FY08	-	0.00
Total	48	324.16
Supervision or ICR		
FY04	-	0.00
FY05	40	87.02
FY06	52	112.91
FY07	26	110.62
FY08	44	124.62
FY09	8	0.00
Total	170	435.17

Note: ICR = Implementation Completion and Results Report. Cost of supervision not available for FY09 from the World Bank's systems.

a. Including travel and consultant costs.

Table A.6 Task Team Members

Name	Title[a]	Unit
Lending		
Moctar Toure	Task Team Leader at appraisal	-
Christine Cornelius	Lead Operations Officer	AFTAR
Moses Sabuni Wasike	Senior Financial Management Specialist	AFTFM
Andrew Mwihia Karanja	Agricultural Economist	AFTAR
Turi Fileccia	Senior Agriculturalist	FAO
Fred Bitanihirwe	Project Analyst	FAO
Michael Foster	Senior Agriculturist	Sasakawa Global 2000
Gem Kodhek	Agricultural Economist	Tegemeo Institute
Enos Esikuri	Environment Specialist	ENV
Tesfaalem Gebreiyesus	Senior Procurement Specialist	AFTPC
Hyacinth Brown	Senior Finance Officer	LOAG2
Hisham Abdo Kahin	Legal Counsel/Consultant	LEGAF
John Boyle	Environment Safeguards Specialist	AFTS1
Roxanne Hakim	Social Safeguards Specialist	AFTS2
Dahir Elmi Warsame	Senior Procurement Specialist	AFTPC
Melissa Brown	Junior Professional Associate	AFTS2
Sandra Jo Bulls	Team Assistant	AFTS2
Lucie Muchekehu	Program Assistant	AFCE2
Supervision or ICR		
Andrew Mwihia Karanja	Senior Agricultural Economist (Task Team Leader)	AFTAR
Henry Amena Amuguni	Financial Management Specialist	AFTFM
Karen Mcconnell Brooks	Sector Manager	AFTAR
Sandra Jo Bulls	Program Assistant	AFTEN
Maina Gathu	Consultant	AFCE2
Jacob Kampen	Consultant (Research)	AFTAR
Berhane Manna	Senior Agriculturist	AFTAR
Lucie Muchekehu	Program Assistant	AFCE2
David J. Nielson	Lead Agriculture Services Specialist	AFTAR
Tom Mboya. Owiyo	Consultant (M&E)	AFCE2
Almaz Teklesenbet	Program Assistant	AFTAR
Dahir Elmi Warsame	Senior Procurement Specialist	AFTPC
Moses Sabuni Wasike	Senior Financial Management Specialist	OPCFM
Mohammed Taqi Sharif	Consultant/ICR Team Leader	AFTAR
Jane K. Njuguna	Consultant/ICR Team Member	AFTAR
Julien Vallet	Consultant/ICR Team Member	AFTAR
Germaine Mafougong	Program Assistant	AFTAR

Note: ICR = Implementation Completion and Results Report.
a. At time of appraisal and closure, respectively.

Kenya Agricultural Productivity and Agribusiness Project (IDA-45920) P109683

Table A.7 Key Project Data

Financing	Appraisal Estimate *($, millions)*	Actual or Current Estimate *($, millions)*	Actual as Percent of Appraisal Estimate
Total project costs[a)]	98.58	70.31	71.3
Loan amount	82.00	65.95	80.4
IDA credit	82.00	65.95	80.4
Cofinancing	16.58	4.36	26.3
Borrower[b)]	14.13	3.79	26.8
Beneficiary[c)]	2.45	0.57	23.3
Cancellation[d)]		16.095	

[a)] In addition to IDA credit and cofinancing from borrower and beneficiary, KAPAP received a $24.47 million grant from the European Commission Trust Funds at appraisal, which amounted to $25.38 million in actual grant disbursement. This support from the European Union Food Crisis Rapid Response Facility Trust Fund was for the related project "Enhancing Agriculture Productivity Project" which had the following components: (a) Agricultural Credit Guarantee Scheme; (b) Agricultural Input Vouchers Scheme; and (c) Orphan Crops Program. It was implemented by the Ministry of Agriculture in coordination with KAPAP but it did not directly contribute to the KAPAP activities.

[b)] The borrower's contribution of $14.13 million at appraisal includes $8.45 million in duties and taxes and $5.60 million in budgetary contribution to the project.

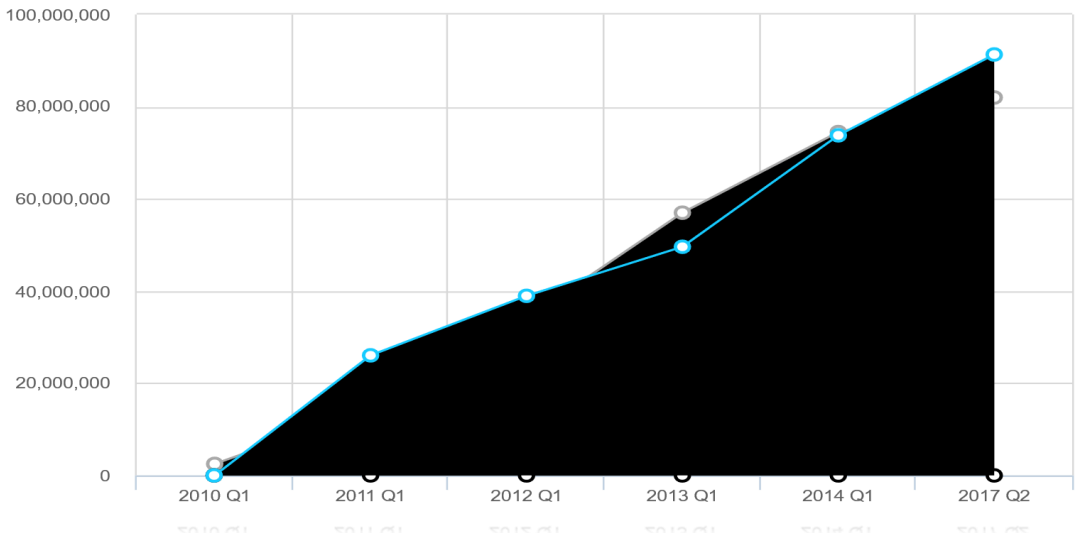
[c)] Farmers' contribution only refers to their paid share capital in cooperatives. Information on their own contribution in materials and labor was not routinely documented, making it difficult to value it in monetary terms as had been envisaged at appraisal.

[d)] At midterm review in June 2013, $16.095 million was cancelled from the original credit amount, which reduced the credit to $65.95 million.

Table A.8 Cumulative Estimated and Actual Disbursements

Disbursements	Appraisal Estimate ($, millions)	Actual ($, millions)	Actual as Percent of Appraisal
2010 Q1	0	0	-
2011 Q1	14,500,000.00	26,053,287.00	179.68%
2012 Q1	34,000,000.00	38,965,240.08	114.60%
2013 Q1	57,000,000.00	49,610,023.19	87.04%
2014 Q1	74,500,000.00	73,789,332.09	99.05%
2017 Q2	82,000,000.00	91,331,344.33	111.38%

Figure A.2 Cumulative Estimated and Actual Disbursements ($)



Note: Blue line = actual disbursement; shaded area = estimated disbursement at appraisal.

Table A.9 Commitment and Disbursement Summary ($, millions)

Source	Net Commitment	Total Disbursed	Undisbursed	% Disbursed
IDA credit	64.28	65.95	0.00	100.00
European Commission Trust Funds	24.47	25.38	0.00	100.00
Total	88.75	91.33	0.00	100.00

Table A.10 Project Dates

Event	Original	Actual
Concept review	12/16/2008	12/16/2008
Appraisal	03/23/2009	05/15/2009
Board approval	06/11/2009	06/11/2009
Signing	07/06/2009	07/06/2009
Effectiveness	03/05/2010	03/04/2010
Closing date	12/31/2014	09/30/2015

Table A.11 Staff Time and Cost

Stage of Project Cycle	World Bank Budget Only	
	Staff time *(no. weeks)*	Cost[a] *($, thousands)*
Lending		
FY08	-	0.00
FY09	28.26	108,260.44
Total	28.26	108,260.44
Supervision or ICR		
FY10	7.78	27,765.28
FY11	14.63	47,190.39
FY12	12.66	45,749.51
FY13	24.88	117,959.22
FY14	30.17	118,737.41
FY15	14.24	66,916.29
FY16	23.45	100,142.15
Total	127.81	524,460.25

Note: ICR = Implementation Completion and Results Report.
a. Including travel and consultant costs.

Table A.12 Task Team Members

Name	Title[a]	Unit	Responsibility or Specialty
Lending			
Almaz Teklesenbet	Program Assistant	AFTAR	
Andrew Karanja	Senior Agricultural Economist, TTL	AFTAR	Former TTL
Asa Torkelsson	Senior Gender Specialist	PRMGE	
Catherine Ragasa	Consultant/Economist	ARD	
Christine Cornelius	Program Coordinator	AFTAR	
Dahir Warsame	Senior Procurement Specialist	AFTPC	
Dana Rysankova	Senior Energy Specialist	AFTEG	
Henry Amuguni	Financial Management Specialist	AFTFM	
Hermann Pfeiffer	Senior Agricultural Officer (Extension)	FAO/CP	
J.-J. Franc de Ferrière	Consultant/Agribusiness Specialist	FAO/CP	
Ladisy Chengula	Senior Natural Resources Management Specialist	AFTEN	
Lisa Paglietti	Consultant/Economist	FAO/CP	
Luisa Matsinhe	Program Assistant	AFTAR	
Mohammed Taqi Sharif	Consultant/Institutional Specialist	AFTAR	
Monica Okwirry	Program Assistant	AFCE2	
Nightingale Rukuba-Ngaiza	Senior Counsel	LEGAF	
Tom Owiyo	Consultant/M&E Specialist	AFCE2	
Yasmin Tayyab	Senior Social Development Specialist	AFTCS	
Supervision			
Almaz Teklesenbet	Program Assistant	AFTAR	
Andrew Karanja	Senior Agricultural Economist - TTL	AFTAR	
Asa Torkelsson	Senior Gender Specialist	PRMGE	
Catherine Ragasa	Consultant/Economist	ARD	
Christine Cornelius	Program Coordinator	AFTAR	
Dahir Warsame	Senior Procurement Specialist	AFTPC	
Dana Rysankova	Senior Energy Specialist	AFTEG	
Henry Amuguni	Financial Management Specialist	AFTFM	
Hermann Pfeiffer	Senior Agricultural Officer (Extension)	FAO/CP	
J.-J. Franc de Ferrière	Consultant/Agribusiness Specialist	FAO/CP	
Ladisy Chengula	Lead Agriculture Economist	GFA07	Current TTL
Lisa Paglietti	Consultant/Economist	FAO/CP	
Luisa Matsinhe	Program Assistant	AFTAR	
Mohammed Taqi Sharif	Consultant/Institutional Specialist	AFTAR	
Monica Okwirry	Program Assistant	AFCE2	
Nightingale Rukuba-Ngaiza	Senior Counsel	LEGAF	
Tom Owiyo	Consultant/M&E Specialist	AFCE2	
Yasmin Tayyab	Senior Social Development Specialist	AFTCS	
ICR			
Ladisy Chengula	Lead Agriculture Economist	GFA07	
Irene Musebe	Agriculture Economist	GFA07	
Sophie Rabuku	Program Assistant	AFCE2	
Eustacius Betubiza	Primary Author, Consultant	GFA07	

Note: ICR = Implementation Completion and Results Report; TTL = task team leader.
a. At time of appraisal and closure, respectively.

Appendix B. Project Areas

KAPP I districts	KAPAP districts
West Pokot	West Pokot, Central Pokot, North Pokot
Nakuru	Nakuru, Molo, Nakuru North, Naivasha, Njoro
Trans Nzoia	Trans Nzoia West, Trans Nzoia East, Kwanza
Nyandarua	Nyandarua North, Nyandarua Central, Nyandarua South, Kipipiri
Nyeri	Nyeri South, Nyeri North, Nyeri Central, Nyeri East
Homa Bay	Homa Bay, Ndhiwa
Gucha	Gucha, Gucha South
Siaya	Siaya, Ugenya
Taita - Taveta	Taita, Taveta
Kilifi	Kilifi, Kaloleni
Tana River	Tana River, Tana Delta
Kwale	Kwale, Kinango, Msambweni
Garissa	Garissa, Fafi, Lagdera
Wajir	Wajir East, Wajir South, Wajir North, Wajir West
Meru Central	Meru Central, Imenti North, Buuri, Imenti South
Makueni	Makueni, Mbooni, Kibwezi, Nzani
Embu	Embu
Kakamega	Kakamega North, Kakamega Central, Kakamega South, Kakamega East
Busia	Busia, Samia, Bunyala
Butere-Mumias	Butere, Mumias

Source: World Bank 2009b, p.19

Appendix C. Project Components

KAPP I

Component 1: Facilitation of Policy and Institutional Reforms

This component aimed to transform previously disparate and disjointed efforts into a coordinated system within the government that results in improved outcomes and more efficient resource allocation. Support for this component was divided under two subcomponents: (i) KAPP I coordinating bodies, and (ii) support to the national reform process which envisaged the establishment of three consultative mechanisms, the National Extension Task Force (NETF), National Research Task Force (NRTF), and National Farmers Forum (NFF). Activities under this component were designed to support the creation of coordination structures and consultative forums for more integrated systems of research, extension and farmer empowerment, and support to the Ministry of Agriculture, Livestock and Fisheries in national capacity building, and technical assistance for policy analysis. Institutional capacity building was expected to facilitate implementation of KAPP activities at national and district levels, and to act as a forum for advancing further policy dialogue.

Component 2: Support to Extension System Reform

The objective of this component was to facilitate a consultative process that will build consensus among stakeholders for a new extension concept and policy. This component built on achievements made under the National Agricultural Extension Policy (NAEP) framework by facilitating the development and internalization of a strategy to build a new system of the national agricultural extension, including the formulation and adoption of a new National Agricultural Sector Extension Policy (NASEP) and its implementation framework by 2007. Support was provided to two subcomponents: (i) facilitation of consultations for extension reform, and (ii) learning pilots and capacity building to test different extension methodologies and delivery systems. Activities under this component included (i) to clarify and rationalize the roles and functions of public, private, and civil society organizations; (ii) to streamline and develop more effective and responsive public services; (iii) to enhance capacity among non-public extension service providers; and (iv) to increase performance and sustainability of the system.

Component 3: Support to Research System Reform

Under this component, the objective was to reform the agricultural research sector so that it encompasses a plurality of actors and becomes more efficient and accountable.

This component aimed to develop a policy instrument and required framework for the institutional and operational functioning of the entire National Agricultural Research System (NARS) for a responsive, demand-driven, and market-oriented technology generation system and pilot collaborative research activities that makes the best and most sustainable use of the available resources. Funding was provided to two subcomponents: (i) to facilitate a consultative process for the establishment of a NARS, which included a comprehensive inventory and institutional assessment of all research institutions in the country; and (ii) support to the Kenya Agriculture Research Institute (KARI) and for its high priority research programs.

Component 4: Support to Farmer/Client Empowerment

This component aimed to establish and support client consultative structures at all levels, and to provide means for improved access to technology, research, and extension services. This last component focused on the reorientation from a supply-driven to a demand-driven service system, through the empowerment of farmers to demand services and providing access to productivity-enhancing agricultural services, as well as building farmers' institutional, management, and technical capacity to plan enterprise development. Two subcomponents included (i) establishment of institutions for farmer organization and empowerment at national, district, and grassroots levels; and (ii) targeted interventions for client empowerment providing training and grants to producer organizations to develop enterprise plans. Activities under this component intended to develop institutional and financial mechanisms that will improve farmers' access to information on technology and services, scale-up application of technology innovations, and give farmers greater influence over the provision of research and extension services.

KAPAP

Component 1: Policy/Institutional and Project Implementation

This component was conceived to improve coordination of the sector and project implementation structures. Two subcomponents implemented activities at both national and local levels: (i) policy and institutional support for a sectorwide approach, driving the policy/reform agenda, and mainstreaming gender; and (ii) support to project implementation and M&E, including the development of a harmonized, sectorwide M&E system linking to a centralized management information system, impact assessment, communication strategy, and networking of stakeholders along the agricultural product value chains.

Component 2: Agricultural Research Systems

This component focused on supporting the research system in the country. It had two subcomponents: (i) support to the NARS to operationalize the NARS policy developed during KAPP phase I for better coordination of agricultural research in Kenya; and (b) Support to KARI for its research programs and institutional support with the aim to make KARI a key player in the proposed NARS. The second subcomponent further focused on promoting an agricultural innovation approach, which is a shift from previous paradigms that focused on capacity building and institutional strengthening. KAPAP also planned to support the development of the necessary legal and administrative instruments necessary for the establishment of an Agricultural Research Trust Fund for KARI and the development of KARI's Agricultural Research Investment Services (ARIS) business plan, to facilitate higher generation of internal revenue.

Component 3: Agricultural Extension, Farmer and Other Stakeholder Empowerment

This component aimed to support the government to implement NASEP and lay the foundations for sustainable intensification and diversification of agricultural production systems and improved linkages to both markets and agribusiness, to generate greater impact for agricultural productivity growth and improved risk management. It included two subcomponents: (i) support the government to implement NASEP targeting the implementation of a pluralistic, participatory, demand-driven, and market-oriented, professional and decentralized extension and innovation system at local and national levels; and (ii) support to empowerment and organization of farmers/clients (for example, the National Federation of Agricultural Producers and cooperatives), service providers, and other stakeholders, toward increased smallholder productivity and transformation of subsistence farming to commercial agriculture for increased income and improved livelihoods.

Component 4: Agribusiness and Market Development Component

This new component aimed to empower public and private stakeholders along selected commodity value chains to plan, design, and set up sustainable agribusinesses through the delivery of agribusiness services and support to set up appropriate funding instruments with value addition and producers' linkages with input and output markets. It included two subcomponents: (i) support to agribusiness development, and (ii) linking rural agro-processing activities to off-grid energy sources. The first subcomponent would support the following interrelated activities: (i) create a network of agribusiness development centers to lead the value chain structuring process while providing agribusiness and market development services to assist stakeholders in elaborating bankable projects; (ii) design and establish appropriate agribusiness funding instruments to be rolled out by financial institutions, and support the development of market-based weather risk products to be rolled out to farmers by insurance companies; (iii) support the creation of one agro food park in each of the four selected regions where relevant agro-processing facilities and marketing infrastructures would be bundled

together along specific value chains; and (iv) enhance training in agribusiness management and food technologies to meet market demands. In conjunction with the Rural Electrification Authority (REA) and the Ministry of Energy, the second subcomponent would set up pilot activities to link agro-processing to local renewable energy sources (such as mini-hydro, biomass, wind, and solar).

Following the midterm review in June 2013, which rated the KAPAP implementation progress toward meeting its project development objective as **moderately unsatisfactory,** although the number of project components was maintained, a series of restructurings were made to some of the components (World Bank 2013):

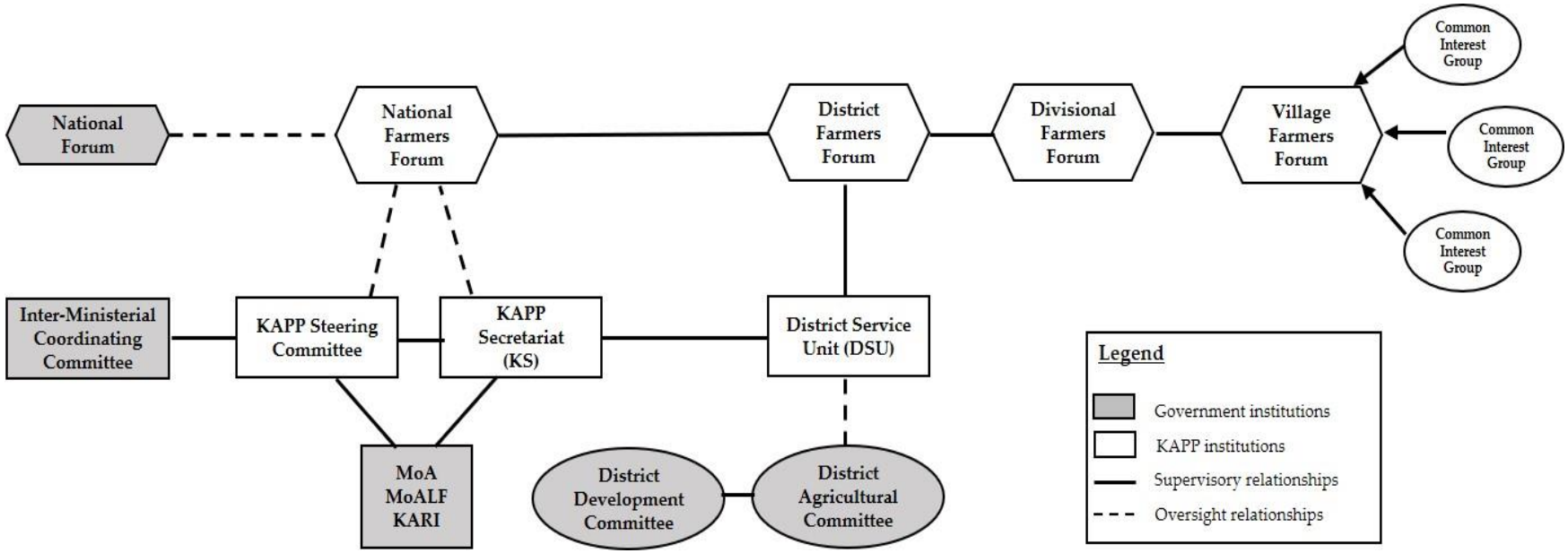
- **Component 1** – While policy support at the national level should continue, there was need for the project to intensify the support for policy interventions to develop promoted value chains at the county level, and to support the development and harmonization of grades and standards of key commodity value chains. Further recommendation included to support initial operationalization of the Kenya Agriculture and Livestock Research Organization (KALRO), documentation of project success and impact assessment, and develop staff skills.
- **Component 2** – The collaborative research grants should be deepened and scaled up to better reflect the value chain consortium approach, with more support in the areas of consortium development, postharvest management, climate change, feeds and feeding, and to enhance the platform for rapid dissemination of information, knowledge and technologies, including enhancing research–extension–farmer and other stakeholder linkages and collaboration. In addition, the project would support the control and surveillance of maize lethal necrotic disease and the External Programme Management Review (EPMR) of KARI and other key KALRO institutes.
- **Component 3** - The midterm review suggested a priority shift toward scaling up the community interventions to cover all the subcounties in the 20 counties with a target of doubling the current number of direct beneficiaries.
- **Component 4** - The scope of activities had to be downsized, in particular the development of the agro-food parks and the agribusiness development centers. Owing to a severe delay in their actual development and unrealistic deadlines for completion of expected results within the remaining project period, the funds that were intended for these activities were redirected instead to identify key agribusiness investments for value addition to consolidate and scale up county-level interventions from the already-developed business plans, and to support public interventions that can create a stable enabling agribusiness environment. The restructuring also recommended to fast track the implementation support to the linking of agro-processing activities to off-grid energy sources.

Reference

World Bank. 2013. "Mid-Term Review Mission – Kenya Agricultural Productivity and Agribusiness Project (KAPAP)." Aide Mémoire, June 10–21, 2013. World Bank, Washington DC.

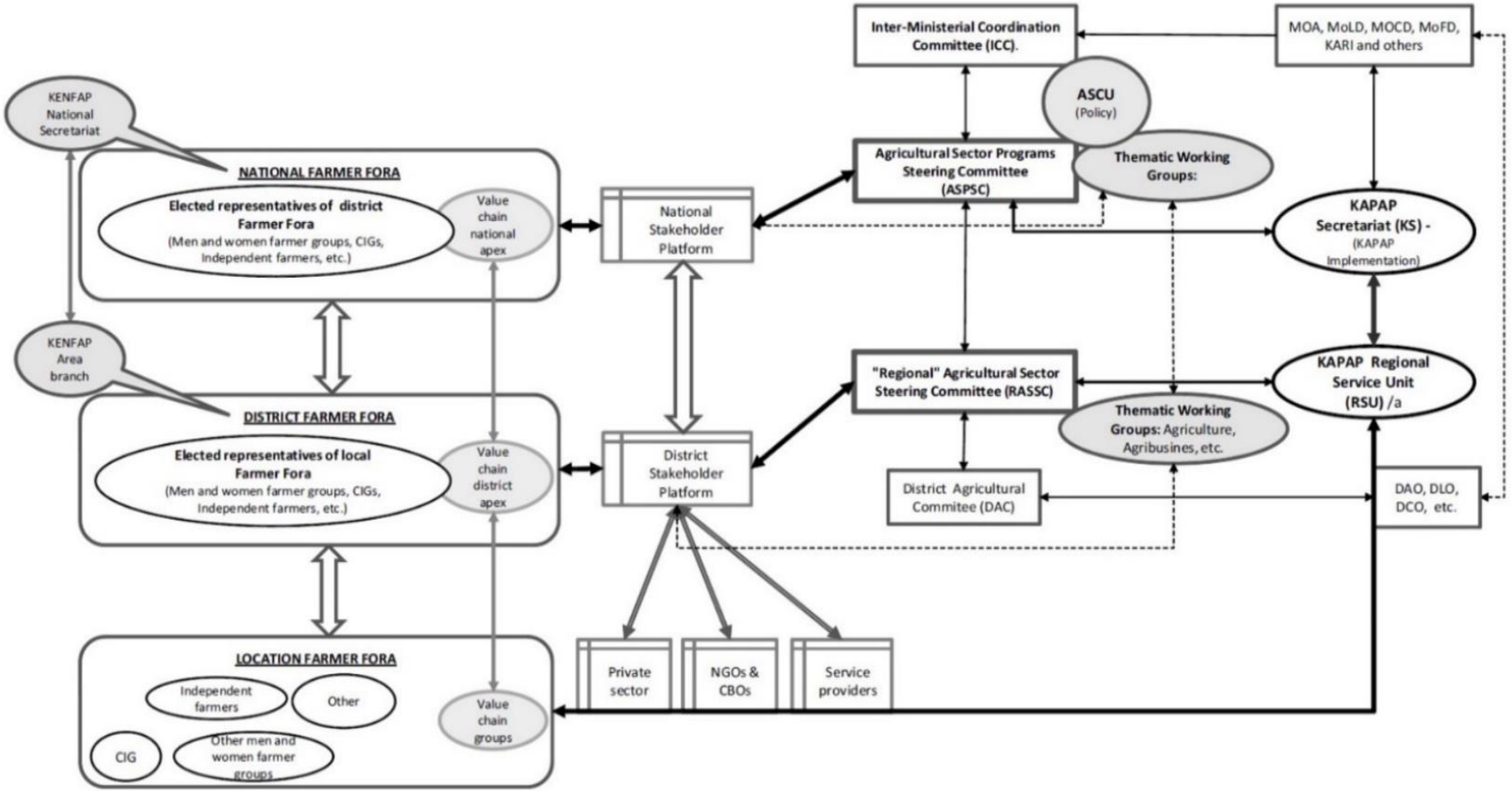
Appendix D. Project Implementation Arrangements

Figure D.1: KAPP I



Source: World Bank 2004b.

Figure D.2: KAPAP



Source: World Bank 2009b.

Appendix E. Methodology and Focus Group Interview Instrument

a) Methodology

KAPP I

The Independent Evaluation Group (IEG) gathered the evidence through a critical review of the project's evaluative evidence, including the project's impact evaluation report and the Implementation Completion and Results Report (ICR), which led to analysis of the existing data on key indicators using the double-difference or difference-in-difference to estimate the net changes resulting from project activities. The difference-in-difference approach (also applied in the ICR) used data from target and control areas before and after the project and allows estimation of the potential causal contribution of the project's activities in driving the outcomes.

This was supplemented by interviews with the project management unit, meetings with relevant government officials and key stakeholders (see appendix F), as well as field-level data and evidence collected by IEG in five counties through interviews of senior agriculture sector directors and/or officers (including crops, livestock, fisheries, and cooperatives) as key informants and focus group interviews with 19 randomly selected common interest groups (CIGs) in the five target counties visited by IEG teams (see appendix G). In an effort to gather comparative data on selected parameters on selected value chains (see appendix E(b) below for the focus group interview instrument), moderated discussions were held using a structured instrument with a group of participating and nonparticipating smallholder farmers.

KAPP II

Similar to KAPP I, IEG first critically reviewed the quality of findings in the existing evaluative studies, including the baseline and impact evaluations commissioned by KAPAP. The best available information on selected performance indicators was extracted for further analysis using more robust analytical approaches such as the double-difference or difference-in-difference analysis. IEG found that despite the strong baseline data collected, the commissioned impact evaluations failed to collect data on many key variables necessary to measure farm productivity (such as crop and livestock yields) and income changes. Given the weak data collected at the end of the project, more rigorous analysis (using difference in difference or other methods) could only be carried out on a few targeted enterprises. The project's impact evaluation report was weak and failed to provide useful evidence to show the net gains resulting from the project.

The phase II analysis was supplemented by interviews with the project management unit, meetings with relevant government officials and key stakeholders (appendix F), as well as field-level data and evidence collected by IEG in five counties through interviews of senior agriculture sector directors and/or officers (including crops, livestock, fisheries, and cooperatives) as key informants and focus group interviews with 19 randomly selected CIGs in the five target counties visited by IEG teams (appendix G). In an effort to gather comparative data on key parameters and selected value chains moderated interviews were conducted by IEG using a structured instrument (see appendix E(b) below) with groups of participating and nonparticipating smallholder farmers.[76]

The findings and lessons from the KAPP experience were further strengthened from review of the evidence from the wider global literature on agricultural extension and institutional reforms, including contracted extension services (Umali 1997; Davis and Place 2003; Feder, Birner, and Anderson 2011; and Kidane and Haggblade 2016).

b) **Instrument used for Focus Group Interviews (FGIs)**

Date _____ Facilitators _____

Name of CIG_____

Number of CWGs involved in the Group: _____

Chairperson _____ Contact number: _____

1. Respondents for the Focus Group Discussion

Name	Role in the CIG *	Gender	Age	Education	Contact number

(*) for non-members indicate non-member

2. Basic characteristics of the CIG

County		Year of establishment	
Sub-county		Legal status	( ) Registered as legal business entity ( ) Not registered
Location		Currently functional?	( ) Yes ( ) No
Main value chain/commodity for the CIG		Member of a legal Cooperative or not?	( ) Yes ( ) No
Level of diversification of value chain/enterprise (number of agribusiness enterprises for CIG)		If member of legal Cooperative – name and is the Coop functional	Coop Name: _____ Functional: ( ) Yes ( ) No
Name the key enterprises relevant for the group		Number of members of the CIG	Male: Female:
Membership fee		CIG has Bank Account	( ) Yes ( ) No
CIG Governance (elected officials)		Capital level for the CIG	
		CIG Governance: regular financial auditing	( ) Yes ( ) No

3. Level of support received from KAPP and KAPAP

3.1 Did your CIG receive in-kind support from the Kenya Agricultural Productivity Project (2004-2008) or Kenya Agricultural Productivity and Agribusiness Project (KAPAP) 2009-2015? If yes indicate below:

	Training in Agribusiness Development	Grant for value chain or enterprise development	Extension service (agricultural advice)	Output Marketing service or market information	Access to inputs or input market information	Credit access from local Bank	Agro-processing or local value addition

KAPP (2004-2008)							
KAPAP (2009-2015)							
Other support (name projects (2004-2015))							

3.2 Did your CIG receive financial support from KAPP and KAPAP?

	Year _____	Year _____	Total received (KSH)
KAPP (2004-2008)			
KAPAP (2009-2015)			
Other sources (specify)			

Remarks……
……

3.3 How relevant (in terms of improving agricultural productivity and incomes of the CIG members) was the support (in-kind and financial) from KAPP and KAPAP compared support from other projects during the same period?

	Compared to _____	Compared to _____	Compared to _____
KAPP (2004-2008)			
KAPAP (2009-2015)			

Codes: Similar = 1; More relevant =2; Less relevant = -2

4. **Describe the contribution of KAPP and KAPAP in terms of the following areas for commercializing and transforming smallholder agriculture**

   i) **Use of contracted Extension Services –** Did your CIG use contracted agriculture extension service providers since 2004? Yes/No_____

   If Yes, what was the contribution of KAPP and/or KAPAP in accessing demand-driven and contracted extension services and have you continued this after the end of the projects?

	Extent of use during KAPP	Main service providers	Extent of use during KAPAP	Main service providers	Extent of use after KAPAP (post-2015)	Main service providers
Use of contracted extension service providers by CIG						

Extent of use of contracted extension providers: None, Low, Moderate, High

If your CIG is currently not using contracted extension providers, why not? (e.g. poor quality of extension service, unprofitability of such services to the group, etc.)
……
……
……

   ii) **Are any members of the CIG privately engaging contracted or private extension providers post 2015?** Yes/No_____

   If Yes, indicate the share of the CIG members and non-members who are currently using private or contracted extension service providers.

	% farmers using private or contracted service providers	**Key enterprises for which contracted providers are used**
CIG members in private		

Non-CIG members in private		

iii) Use of Contracted Agribusiness Service – Did your CIG use any contracted agribusiness service provides since 2004? Yes/No_____

If Yes, what was the contribution of KAPP and/or KAPAP in accessing demand-driven and contracted agribusiness services and have you continued this after the end of the projects?

	Extent of use during KAPP	**Main service providers**	**Extent of use during KAPAP**	**Main service providers**	**Extent of use after KAPAP (post 2015)**	**Main service providers**
Use of contracted agribusiness service Providers by CIG						

Extent of use of contracted agribusiness service providers: None, Low, Moderate, High

If not using contracted agribusiness service providers, why not (e.g. poor quality of service, unprofitability of such services to the group, etc.)

……
……
……
……

iv) Are any members of the CIG privately engaging contracted agribusiness service providers post 2015? Yes/No_____

If Yes, indicate the share of the CIG members and non-members who are using private or contracted agribusiness service providers.

	% farmers using private or contracted agribusiness service providers	**Key enterprises for which contracted agribusiness service providers are used**
CIG members in private		
Non-CIG members		

v) **Participation in agro-processing or value addition –** Was your CIG involved in local agro-processing or value addition since 2004?
Yes/No_____

Main agro-processing operation _____
What was the contribution of KAPP and/or KAPAP?

	Extent of operation during KAPP	**Extent of operation during KAPAP**	**Extent of operation after KAPAP (post 2015)**
Participation in agro-processing or value addition			

Extent of operation or participation: None, Low, Moderate, High

If the CIG has stopped participating in agro-processing or value addition post-2015, why?
……
……
……
……

vi) **Participation in other agribusiness enterprises –** Did your CIG participate in other local agribusiness enterprise or value chain since 2004?
Yes/No_____

If yes, in which other enterprises is your CIG involved in?
_____

	Extent of operation during KAPP	**Extent of operation during KAPAP**	**Extent of operation after KAPAP (post 2015)**
Participation in other agribusiness enterprise			

Extent of operation or participation: None, Low, Moderate, High

If currently not involved in other agribusiness enterprise, why?
……
……
……
……

vii) **Market information** – Did your CIG receive regular and timely market information or main contacts with buyers of your produce since 2004? Yes/No_____

If yes, what was the contribution of KAPP and/or KAPAP?

	Extent of access during KAPP	**Main service providers**	**Extent of access during KAPAP**	**Main service providers**	**Extent of access after KAPAP**	**Main service providers**
Access to market information						

Extent of access: None, Low, Moderate, High

If the CIG is currently not accessing market information, why?

……
……
……
……

viii) **Contracted buyers –** Did your CIG use contracted buyers for your produce since 2004? Yes/No_____

If yes, what was the contribution of KAPP and/or KAPAP?

	Extent of use during KAPP	**Main buyers**	**Extent of use during KAPAP**	**Main buyers**	**Extent of use after KAPAP (post 2015)**	**Main buyers**
Use of contracted buyers for your produce						

Extent of use: None, Low, Moderate, High

If the CIG is not using contracted buyers, why?

……
……

……
……

ix) **Contracted suppliers of inputs –** Did your CIG use contracted suppliers for your main inputs e.g. fertilizer and improved seeds?
Yes/No_____

If yes, what was the contribution of KAPP and/or KAPAP?

	Extent of use during KAPP	**Main suppliers**	**Extent of use during KAPAP**	**Main suppliers**	**Extent of use after KAPAP (post 2015)**	**Main suppliers**
Use of contracted suppliers of inputs						

Extent of use: None, Low, Moderate, High

If the CIG is not using contracted suppliers for inputs, why?
……
……
……
……

x) **Physical market infrastructure and facilities –** Did your CIG access marketing shades, storage facilities and transport services for its activities? Yes/No_____

If yes, what was the contribution of KAPP and/or KAPAP?

	Extent of access during KAPP	**Main suppliers**	**Extent of access during KAPAP**	**Main suppliers**	**Extent of access after KAPAP (post 2015)**	**Main suppliers**
Access to market infrastructure and facilities						

Extent of access: None, Low, Moderate, High

If the CIG is not accessing market infrastructure and facilities, why
……
……
……

……

xi) **CIG Commercial Viability –** Has the CIG achieved commercial viability for its main value chain enterprises? Yes/No_____

If yes, what was the contribution of KAPP and/or KAPAP?

	Viability during KAPP	**Main Enterprises**	**Viability during KAPAP**	**Main Enterprises**	**Viability after KAPAP (post 2015)**	**Main enterprises**
CIG commercial viability						

Commercial viability: Non-viable, marginally viable, moderately viable, highly viable

If not commercially viable, why?

……
……
……
……

xii) **Empowerment of producer groups –** Has the CIG helped its members gain voice and better negotiate access to training, capacity building and other services and influence the planning and implementation of relevant agricultural programs in the community? Yes/No_____

If yes, what was the contribution of KAPP and/or KAPAP?

	Extent of empowerment during KAPP	How	Extent of empowerment during KAPAP	How	Extent of empowerment after KAPAP (post 2015)	How
CIG contribution to empowerment of producers						

Extent of empowerment: None, Low, Moderate, High

If the CIG was not able to contribute to empowerment of producers, why?

……
……
……
……

xiii) Adoption of agricultural, livestock of fisheries technologies and practices: has the adoption of the technologies (e.g. fertilizer, improved seeds, new livestock breeds, soil and water management, etc.) increased since 2004/2005? Yes/No_____

If yes, what was the contribution of KAPP and KAPAP (in terms of % increase in adoption in your CIG and how does this compare to other farmers who did not participate in KAPP or KAPAP)?

Farmers	**For the main crop/livestock enterprises indicate the % of households adopting technologies or best practices promoted by KAPP and KAPAP**					
	Enterprise ----------	**Enterprise** ----------	**Enterprise** ----------	**Enterprise** ----------	**Enterprise** ----------	**Enterprise** ----------
KAPP (2004-2008)						
Non-KAPP (2004-2008)						
KAPAP (2009-2015)						
Non-KAPAP (2009-2015)						

xiv) Productivity or yield (e.g. tons/ha or kg/acre, liters of milk yield/day) – define the unit

Farmers	**Include each of the crops and livestock enterprises promoted by KAPP and KAPAP**					
	Enterprise ----------	**Enterprise** ----------	**Enterprise** ----------	**Enterprise** ----------	**Enterprise** ----------	**Enterprise** ----------
KAPP (2004-2008)						
Non-KAPP (2004-2008)						
KAPAP (2009-2015)						
Non-KAPAP (2009-2015)						

5. Overall Assessment: Changes in productivity and income and effect of KAPP and KAPAP

i) Can you tell us what would have happened if you did not participate in the CIG and remained individual farmers? (to see the effect of CIG participation and KAPP/KAPAP support together)

	It did not matter (effect is marginal)	**It made some difference (indicate the change in percent)**	**It made a major difference (indicate the change in percent)**
Agricultural productivity			
Net income of the CIG members			

ii) Can you tell us what would have happened if your CIG did not receive support from KAPP and KAPAP in terms of your overall agricultural productivity and incomes? (to isolate the direct effect of KAPP and KAPAP support from the total effect)

	It did not matter (effect is marginal)	**It made some difference (indicate the change in percent)**	**It made a major difference (indicate the change in percent)**
Agricultural productivity			
Net income of the CIG members			

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Feder, G., R. Birner, and J. Anderson. 2011. "The Private Sector's Role in Agricultural Extension Systems: Potential and Limitations." *Journal of Agribusiness in Developing and Emerging Economies* 1(1): 31–54.

Kidane, T., and S. Haggblade. 2016. "Different Agricultural Extension Systems Implemented in Africa: A Review." *Journal of Human Ecology* 55(3): 183–95.

Umali, D. 1997. "Public and Private Agricultural Extension: Partners or Rivals?" *The World Bank Research Observer 2*(2)*:* 203–224.

[76] Focus group interviews are conducted with a small group of respondents, typically six to eight, who voluntarily participate in a short interview (often between 30 and 60 minutes in duration). The participants, often selected based on their familiarity with the issues under study, are asked to reflect on questions asked by the interviewer who also ensures that the conversation flows freely and no one individual is allowed to dominate others. Participants then get to hear each other's responses and make adjustments based on what others in the group have said. The qualified collective response improves data quality in situations where individual respondents face recall or awareness issues on some aspects and others in the peer group are better able to fill gaps and/or provide qualifying responses based on reflection and group interaction.

Appendix F. List of Persons Met

No	Name	Organization	Title
World Bank			
1	Ladisy Komba Chengula	World Bank	Lead Agriculture Economist and Task Team Lead for KAPAP
2	James Muli Musinga	World Bank	Senior Agriculture Economist
3	Josephat Sasia	World Bank	Lead Transport Specialist
Government of Kenya			
4	Felister Makini	Kenya Agricultural and Livestock Research Organization (KALRO)	Director Crops
5	Felister Wambugha Mvoi Makini	Kenya Agricultural and Livestock Research Organization (KALRO)	Deputy Director General, Crops
6	Foutine Wandera	Kenya Agricultural and Livestock Research Organization (KALRO)	Assistant Director Livestock
7	Joseph Muriti	Kenya Agricultural and Livestock Research Organization (KALRO)	Director Livestock
8	Lusike Wasilwa	Kenya Agricultural and Livestock Research Organization (KALRO)	Assistant Director Crops
9	Wandera Foustine Peter	Kenya Agricultural and Livestock Research Organization (KALRO)	Director of Livestock Systems, KALRO Secretariat
10	John M. Mwaniki	Ministry of Agriculture and Irrigation, State Department for Crops Development	Director
11	Richard Leresian Lesiyampe	Ministry of Agriculture and Irrigation, State Department for Crops Development	Principal Secretary
12	Grace Agili	Ministry of Agriculture, Livestock and Fisheries	Former Director of AIRC, current Deputy Director, Parliamentary Business Unit
13	John I. Njoroge	Ministry of Agriculture, Livestock and Fisheries	Assistant Director of Agriculture, Directorate of Agribusiness and Market Development
14	Zakayo Magara	Ministry of Agriculture, Livestock and Fisheries	Deputy Director Crop Resources
15	Symon C.J. Mburia	State Department for Co-operatives, Ministry of Trade, Industry & Co-operatives	Senior Officer
16	Njoroge Irungu	State Department of Crops Development – Policy and External Regulations	Director
17	Joyce Thaiya	State Department of Livestock Development	
18	Sammy Macharia	State Department of Livestock Development	

19	Samuel Matoke	State Department of Livestock Development	Director
County Officers			
20	John Nyaga	Embu County	Chair, Country Agriculture Officer
21	Josephine Kinoti	Embu County	Crops Officer
22	Judith Katumo	Embu County	
23	Patrick Muita	Embu County	Crops and Link to Services
24	Patrick Muteri	Embu County	Cooperatives
25	Zipporah Marei	Embu County	Livestock
26	Amos Ndunda	Makueni County	Director of Crops
27	David Musyoki	Makueni County	Director of Livestock
28	Lawrence Nzunga	Makueni County	Minister of Agriculture
29	Stanley Nungutu	Makueni County	Director of Fisheries
30	Lawrence Mbobwa	Meru County	Crops Officer
31	Mary Mburugu	Meru County	Agribusiness Officer
32	Patrick Ng'ang'a	Meru County	Director of Agriculture
33	Samuel Otieno	Meru County	Cooperatives Officer
34	Silas Kamundi	Meru County	Livestock Officer
35	Joseph Bett	Nakuru County	Crops Officer
36	Joseph Kimani	Nakuru County	Fisheries Officer
37	Paul Njagi	Nakuru County	Cooperatives Officer
38	Peter Njoroge	Nakuru County	Director of Agriculture
39	Raymond Mwangi	Nakuru County	Livestock Officer
40	Alice Gichuki	Nyeri County	Director of Agriculture
41	Beatrice Theuri	Nyeri County	Statistics Officer
42	Caroline Macharia	Nyeri County	Crops Officer
43	Lucy Mwangi	Nyeri County	Livestock Officer

District Service Units			
44	Antony Gateri	District Service Units (DSU)	Former staff, Embu County
45	Esther Wambua	District Service Units (DSU)	Former staff, Makueni County
46	Jane Ndungu	District Service Units (DSU)	Former staff, Nyeri County
47	Joseph Muia	District Service Units (DSU)	Former staff, Garissa County
UN and Bilateral Agencies			
48	Romano Kiome	USAID ACUB	Chief of Party - USAID AUCB, Former PS Ministry of Agriculture, Former DG of KARI
49	David Mwangi Njuru	Delegation of the European Union to Kenya	Rural Development Officer
50	Myra Bernardi	Delegation of the European Union to Kenya	Head of Section, Agriculture, Job Creation and Resilience
51	Anne Chele	Food and Agriculture Organization	Agriculture Policy Officer
52	Barrack Okoba	Food and Agriculture Organization	Climate Smart Agriculture Officer
53	Gabriel Rugalema	Food and Agriculture Organization	FAO Representative in Kenya
54	Stanley Kimere	Food and Agriculture Organization	Agronomist
55	Tito Arunga	Food and Agriculture Organization	Agribusiness Officer
56	Duncan Marigi	Swedish International Development and Cooperation Agency	Program Manager, Agriculture and Rural Development
57	Samson Okumu	USAID	Activity Manager, Agriculture, Business and Environment Office
Research institutions			
58	Prasana Bodapuli	CGIAR-CIMMYT	Director, Maize Global Program
59	Moses Siambi	CGIAR-ICRISAT	Regional Director for Eastern and Southern Africa
60	Festus Njoge	Kenya Agricultural and Information Resource Centre	Mass Media Expert
61	David Kios	Kenya Animal Genetic Resource Centre (KARGRC)	Chief Executive Officer

NGOs and Evaluation			
62	Bengi Albert	Kenya Climate Smart Agriculture Project (KCSAP)	
63	Edwin C. Ikitoo	Kenya Climate Smart Agriculture Project (KCSAP)	Coordinator Climate-Smart Agricultural Research and Innovation
64	Florence Odweso	Kenya Climate Smart Agriculture Project (KCSAP)	Former KAPAP Secretariat
65	Francis K. Muthami	Kenya Climate Smart Agriculture Project (KCSAP)	National Coordinator
66	Gilbert Muthee	Kenya Climate Smart Agriculture Project (KCSAP)	Former KAPAP Secretariat
67	Jane Ngugi	Kenya Climate Smart Agriculture Project (KCSAP)	Former Gender and Social Development Specialist for KAPP/KAPAP
68	Priscilla Muiruri	Kenya Climate Smart Agriculture Project (KCSAP)	Former KAPP/KAPAP secretariat, current Project Coordinator
69	Charles Mbuthia	Kenya National Farmers Federation (KENAFF)	Programs Officer
70	Daniel Gachohi	Kenya National Farmers Federation (KENAFF)	Program Officer
71	Daniel Mwenda M'Mailutha	Kenya National Farmers Federation (KENAFF)	Chief Executive Officer
72	George Nyamu	Kenya National Farmers Federation (KENAFF)	Program Coordinator
73	Janet Omollo	Kenya National Farmers Federation (KENAFF)	County Coordinator, Homa Bay, Siaya
74	Judy Nkatha	Kenya National Farmers Federation (KENAFF)	County Coordinator, Meru
75	Wairumu (Pauline) Kariuki	Kenya National Farmers Federation (KENAFF)	National Chair of Kenya Poultry Farmers Association, Poultry Producer's Association
76	Winnie Mitani	Kenya National Farmers Federation (KENAFF)	County Coordinator, Kilifi
77	Francis Baiya	Retired	Former M&E Expert

Appendix G. Sampled Common Interest Groups for IEG field visits

County	Value chain or enterprise	CIG	Year of Establishment
Nakuru	Apiculture	Mariashoni Bee Keepers Group	2014
	Rabbit	Tumaini Rabbit Centre	2015
	Fish	Mumwela Fish Value Chain	2013
Nyeri	Dairy	Nyakia Dairy Self-Help Group	2011
	Banana	Iruri Banana Growers Self-Help Group	2011
	Rabbit	Giathege Rabbit Keepers	2012
	Potato	Aberdare Potatoes Growers	2013
Meru	Banana	Mulango Mukono Banana Self-Help Group	2014
	Black Beans, Sorghum	Ruiri Cereal Growers	2008
	Dairy	Naari Dairy Farmers Society	1972
Makueni	Cassava, Legumes, Non-Farm Business	Mbuvo Solar Off-Grid Company Limited	2010
	Poultry	Wendano Tangu	2011
	Green Grams, Poultry, Mango	Kavuko Green Grams	2015
	Mango	Kyamwali Fruit VC Development SHG	2012
Embu	Banana	Kiagucu-Gachichiro Banana Growers	2013
	Fish, Table Banking, Merry Go Round	Mukatha Aquaculture	2010
	Passion fruits	Sweet Yellow Passion Growers	2011

Appendix H. Competitive Research Grants to National Agricultural Research Systems

	Value Chains	Lead Institution	Implementing Agencies	Examples of the Achievements
1	Cereals	Egerton University	Egerton University and Consortium	High yielding sorghum variety for brewing selected and cost-effective thresher/dryer promoted.
2.	Fruits (mango and passion fruit)	KALRO Kandara (Thika)	KALRO Kandara (Thika) and Consortium	Salinity-tolerant mango root stocks propagated and distributed Passion fruit varieties screened for disease resistance
3.	Vegetables (African indigenous vegetables, mushroom, and French beans)	Mount Kenya University	Mount Kenya University and Consortium	Preferred pumpkin seed varieties multiplied
4.	Dairy (cow, goat and camel milk)	KALRO, Embu	KALRO, Embu and Consortium	Multifaceted evaluations with potential for better animal nutrition and health; thermos-stable culture for yoghurt preparation evaluated
5.	Meats (beef and indigenous chicken)	University of Nairobi	University of Nairobi and consortia members	Interventions for indigenous chicken promoted, resulting in reduced mortality and higher productivity
6.	Aquaculture (Fish - Nile, tilapia, Ningu, and catfish)	Kenya Marine and Fisheries Research Institute, Sagana	KMFRI Sagana and Consortium	Improved tilapia fingerlings distributed, better feed formulated, value addition promoted, and information and communications technology systems to link farmers to markets developed
7.	Natural resource management (such as planting of trees, soil and water conservation) as well as cross cutting	Kenyatta University	Kenyatta University, KALRO National Agriculture Research Laboratories	Soil and water conservation technologies promoted
8.	Maize lethal necrotic disease	KALRO National Agriculture Research Laboratories	Kenyatta University, KALRO National Agriculture Research Laboratories and Consortium	Awareness created, epidemiology carried out, and vectors identified – still work in progress

Appendix I. Technologies and Innovations Developed by KARI/KALRO through KAPAP Support (2010–14)

Value Chain	Number of Technologies Developed	Varieties Developed and Released, and Extent of Adoption	Productivity Gain (%) on Farmers' Fields over Existing Technologies in the Hands of Farmers
Cereals	54	Of which 39 maize; 8 wheat; 2 rice; 1 sorghum; and 4 finger millet varieties have undergone National Performance Trial (NPT) and Distinctness Uniformity and Stability (DUS) trials and released. Drought-tolerant and insect-resistant maize and bio-fortified sorghum are undergoing confined field trials.	Maize: 10% (0.5 t/ha) above check variety for mid-, dry-, and low-land varieties and 5% (0.25 t/ha) for high-land varieties (5.5 t/ha for improved and 5 t/ha for check varieties). 35 varieties Wheat: 5% (0.2 t/ha) above check variety (4.2 t/ha for improved and 4 t/ha for check varieties). 16% i.e. from 2.5 tons to an average of 3.0 tons/ha. Support from KAPAP was in tandem with other sources such as 'Durable Rust Resistance Wheat' Rice: 5% (0.15 t/ha) above check variety (3.15 t/ha for improved and 3 t/ha for check varieties) Sorghum: 5% (0.18 t/ha) above check variety (3.78 t/ha for improved and 3.6 t/ha for check varieties). The variety KM 32-1 yielded 2.52 tons/ha, Gadam 2.37 tons/ha and KARI MTAMA 1 2.14 tons/ha. The results indicated a 4.78% yield increase above the best check and 8.35% yield increase above mean of checks for km 32-1 sorghum variety Finger Millet: 5% (0.1 t/ha) above check variety (2.1 t/ha for improved and 2 t/ha for check varieties)
Grain Legumes	11	10 MAC beans and 1 chickpea have undergone NPT and DUS and released.	Mac Beans: 5% (0.12 t/ha) above check variety (2.52 t/ha for improved and 2.4 t/ha for check varieties).

Value Chain	Number of Technologies Developed	Varieties Developed and Released, and Extent of Adoption	Productivity Gain (%) on Farmers' Fields over Existing Technologies in the Hands of Farmers
		Groundnut - 2 groundnut varieties: ICGV-SM 88710 and ICGV-SM 88749 identified for tolerance to rosette virus disease and recommended to farmers. Brochure for aflatoxins management in groundnut seed production developed and promoted Soybean - Dual SB 19 soybean variety recommended to farmers for production and soil fertility improvement	Chickpea: 5% (0.05 t/ha) above check variety (1.05 t/ha for improved and 1 t/ha for check varieties).
Root and Tubers, and Oil Crops	27	13 sweet-potatoes, 3 cassava, 10 MAC beans and 1 chickpea have undergone NPT and DUS and released. Virus resistant bio-fortified cassava are undergoing confined field trials. Sesame - One improved sesame line: KSIM 001 tolerant to Phyllody virus disease identified and 100 kg of seed multiplied under irrigation in collaboration with KVDA. Three sesame land races identified by seed purification from local seed mixture Oil palm - 3 Oil palms hybrids: Deli x Ghana, Bamenda x Ekona, Tan x Ekona identified for commercial production; acreage under oil palm production increased by 15%. Hole size of 50 x 45 cm validated as optimum for planting oil palm	Sweet Potatoes: 5% (1.5 t/ha) above check variety (31.5 t/ha for improved and 30 t/ha for check varieties) Cassava: 5% (1.8 t/ha) above check variety (37.8 t/ha for improved and 36 t/ha for check varieties)
Fruits and Vegetables	25	Some 25 varieties and 10 management technologies and innovations have been adopted in some areas. Tissue culture protocols for banana, cassava, sweet potato, vanilla and aloe vera developed; Coconut tissue culture protocol under validation. 2 mango rootstock varieties (turpentine, 13-1) and 3 management technologies and innovation (jelly seed control, mango weevil and fruit fly control) have been adopted in some areas	Mango: 10% gain in productivity Avocado: 10% gain in productivity Passionfruit: 5% gain in productivity Papaya: Average growth of 5.6% over the period 2012–16

Value Chain	Number of Technologies Developed	Varieties Developed and Released, and Extent of Adoption	Productivity Gain (%) on Farmers' Fields over Existing Technologies in the Hands of Farmers
		5 mango exotic varieties (Tommy Atkins, Kent, Van Dyke, Haden and Sabine) have been promoted 1 avocado rootstock variety resistant to root rot disease (G77) validated and promoted, 2 commercial varieties Hass and Fuerte have been promoted in new areas 5 sweet yellow varieties developed and gazetted 6 advanced TKA-tomato lines with resistance/tolerance to nematodes and bacterial wilt developed and tested on-farm in hotspot areas) 5 Tomato varieties (Anna F1, Nuru F1, Tylka F1, Tegemeo F1, Libra F1) evaluated for performance under "greenhouse" cultivation 2 kale lines developed in collaboration with CABI and released as varieties Tosha and Kinale Commercial cotton varieties are HART 89 M and KSA 81 M; Yield potential is 2 to 2.5 tons/ha, respectively: The national average is 0.6 tons/ha. Use of the improved technologies i.e. Certified seeds of the 2 varieties, crop health and agronomic packages recommended by KALRO, farmers are expected to triple their current yields.	Tomato: TKA lines-20% yield gain; F1 Hybrids in greenhouse- yields 4-5 times higher than open field Brassica: Released kale varieties -30% productivity gain Cotton: Use of the improved KALRO technologies will triple the current cotton yields i.e. productivity gain of approximately 300 and 200% for HART 89M and KSA 81M respectively.
Animal production	15	Hatching capacity has been increased in Kakamega; Research facilities in KARI Naivasha rehabilitated and stocked with pedigree pigs.	
Animal health	13	Contagious caprine pleuropneumonia latex agglutination kit commercialized; brochure on appropriate tsetse and trypanosomiasis control strategies for Isiolo and Marsabit developed; OrmaBoran—a trypano-tolerant cattle herd—established at Alupe; East Coast Fever vaccine validated;	

Value Chain	Number of Technologies Developed	Varieties Developed and Released, and Extent of Adoption	Productivity Gain (%) on Farmers' Fields over Existing Technologies in the Hands of Farmers
		accreditation of Virology Reference Diagnostic Laboratory/residue analysis laboratories in Muguga to 17025:2005.	
Biotechnology	5	Tissue culture protocols for banana, cassava, sweet potato, vanilla, and aloe vera developed; coconut tissue culture protocol under validation; drought-tolerant and insect-resistant maize; virus resistant bio-fortified cassava; bio-fortified sorghum; and insect-resistant cotton are undergoing confined field trials.	
Aquaculture	0		
NRM	4	Reconnaissance surveys have been conducted in Kajiado Central and Isinya districts of Kajiado County for multipurpose land use planning and soil maps and reports are available; A total of 34 databases have been created Validation and promotion of soil and water management for maize and dry beans has been done in Central Kenya; Performance small scale irrigation system and schemes has been assessed and recommendations on improvement given; drainage technologies and strategies for managing technologies for water-logged agricultural lands and Vertisols developed.	Yield gain from improved NRM: Recommendations for specific improvements in small scale irrigation schemes done in 25 counties. Adoption of recommendations led to 20 to 100% increase in production through crop yields and productive land expansion due to water saving. Application of ridges and farm yard manure application in waterlogged soils resulted in 17-25% yield gains compared to existing farmer's practices for Green gram and tomato crops. This significantly enhanced household income.
Apiculture	0		
Pyrethrum	0		
Total	154	The technologies developed are indicated to be responding to the needs of both women and men since the targeted crops (maize, cassava, banana, sorghum, aloe) are key enterprise for both men and women farmers. Over 60% of the beneficiaries for sorghum and aloe are indicated to be women.	

Source: Provided by KALRO, July/August 2018

Appendix J. Estimated Differences in Adoption and Yields and Net Farm Income for Selected Enterprises in Sampled Common Interest Groups

Table J.1: Estimated Differences in the Rates of Adoption of Improved Agricultural Technologies

Enterprise or Product	County	Common Interest Group	Members (% adopters)	Nonmembers (% adopters)
Banana	Embu	Kiaguchu Gachichiro	90	50
Banana	Nyeri	Iruri	40	10
Banana	Meru	Mulango-Mukono	60	10
Beans	Meru	Ruiri	60	10
Cassava	Makueni	Mbuvo solar off-grid	100	50
Chicken	Makueni	Wendano Tangu	70	30
Dairy	Makueni	Kikoko	80	20
Dairy	Nyeri	Nyakia	60	40
Dairy	Meru	Naari	100	60
Fish	Embu	Mukatha Aquaculture	100	20
Fish	Nakuru	Mumela	20	0
Green grams	Makueni	Kavuko Green grams	40	20
Honey	Nakuru	Mariashoni	60	40
Mango	Makueni	Kyamwali fruit	100	60
Passion	Embu	Sweet yellow passion growers	60	30
Potato	Nyeri	Abadare	70	30
Rabbit	Nakuru	Tumaini	70	30
Rabbit	Nyeri	Giathege	60	20

Source: IEG Focus Group Interviews, July 2018.

Table J.2: Estimated Yield Differences for Selected Enterprises

Value Chain	Common Interest Group	Unit	Participants	NonParticipants
Banana	Kiaguchu Gachichiro, Embu	tons/acre	35	20
Banana	Iruri, Nyeri	kg/tree	140	50
Banana	Mulango-Mukono, Meru	tons/acre	5	1
Beans	Ruiri, Meru	bags/acre	6	3
Cassava	Mbuvo solar off-grid, Makueni	tons/ha	20	8
Chicken	Wendano Tangu, Makueni	chickens per family	40	5
Dairy	Kikoko, Makueni	liters/cow/day	12	3
Dairy	Nyakia, Nyeri	liters/cow/day	15	5
Dairy	Naari, Meru	liters/cow/day	10	3
Fish	Mukatha Aquaculture, Embu	number per pond	300 (tilapia) and 800 (catfish)	100 (catfish)
Fish	Mumela, Nyeri	number per pond	700	0
Green grams	Kavuko Green grams, Makueni	bags/acre	4	3
Honey	Mariashoni, Nakuru	kg/hive	10	4
Mango	Kyamwali fruit, Makueni	tons/acre	3.5	2
Passion	Sweet yellow passion growers, Embu	tons/ha	15	8
Potato	Abadare, Nyeri	bags/acre	80	40
Rabbit	Tumaini, Nakuru	rabbits per farm	50	30
Rabbit	Giathege, Nyeri	rabbits per farm	20	5

Source: IEG Focus Group Interviews, July 2018.

Table J.3: Estimated Changes in Net Farm Income for KAPAP Participants (Compared with Nonparticipants) for Selected Enterprises

Enterprise Value Chain	Common Interest Group	% Change in Net Farm Income Compared with Nonparticipants
Rabbit	Tumaini, Nakuru	20
	Giathege, Nyeri	20
Fish	Mumela, Nyeri	20
Potato	Abadare, Nyeri	40
Dairy	Nyakia, Nyeri	30
	Naari, Meru	40
Banana	Iruri, Nyeri	30
	Mulango-Mukono	40
Beans	Ruiri, Meru	40
Apiculture	Mariashoni, Nakuru	40
Cassava	Mbuvo solar off-grid, Makueni	35
Mango	Kyamwali fruit, Makueni	30
Chicken	Wendano Tangu, Makueni	50

Dairy	Kikoko, Makueni	30
Green grams	Kavuko Green grams, Makueni	10
Banana	Kiaguchu Gachichiro, Embu	30
Fish	Mukatha Aquaculture, Embu	40
Passion	Sweet yellow passion growers, Embu	15

Source: IEG Focus Group Interviews, July 2018.

Appendix K. Status of KAPAP-Supported Cooperatives and Agricultural Extension in Selected Counties

Table K.1: Status of Cooperatives in Selected Counties

Counties	KAPAP Supported Cooperatives	Value Chains that Received Core Funding	Dormant	Partially Active	Active or Vibrant Cooperatives [b]
Embu	4 (Banana, Mango, Fish, Passion fruit)	Banana, Fish	Passion	Mango	Banana, Fish
Makueni	6 (Poultry, Mango, Dairy, Legumes (green grams)) [a]	Mango, Poultry, Dairy	Green gram	Poultry	Mango, Dairy
Meru	5 (Fruits, Grains, Rabbit, Dairy, poultry)	Dairy, Banana, Grains	Poultry, Rabbit, Fruits	-	Dairy, Banana, Grains
Nyeri	5 (Dairy, Rabbit, Potatoes, Banana, Fish)	Potato, Rabbit	Banana, Fish	Rabbit	Potato, Dairy
Nakuru	6 (Apiculture, Poultry, Rabbit, Fish, Dairy, Pyrethrum)	Dairy, Apiculture	Poultry, Rabbit, Fish, Pyrethrum	-	Dairy, Apiculture

[a] There is at least one cooperative for each value chain, with some, such as mango and dairy, having more than one cooperative in different subcounties.

[b] Active or vibrant means that the cooperatives are actively functional by producing desired volumes, aggregating their produce and marketing it jointly. However, they are often unable to pay for private extension services except in the case of dairy where agricultural extension and veterinary services are provided by the dairy cooperative on a check off basis.

Source: IEG field visit (July 2018).

Table K.2: Status of Agricultural Extension

Counties	Public Extension Staff	Average Extension Workers per Ward	Remarks
Makueni	150	5	Agriculture budget is about 8 percent of county budget. The estimated number of farm households is 207,282. Hence, 1 extension officer serves about 1,381 households.
Embu	300	15	Agriculture budget is about 2% of the county budget. The estimated number of farm households is 116,400. Hence, 1 extension officer serves about 388 households.
Meru	170	2 (but some wards do not have any extension agents)	Extension staff recruitment is frozen and the private extension service has been unable to fill the gap. The estimated number of farm households is 314,736. Hence, 1 extension officer serves about 1,851 households.
Nyeri	145	2 (but some wards do not have any extension staff)	Extension staff recruitment is frozen but aiming to hire interns to provide extension services; bought four new vehicles and a number of motorbikes for extension staff but limited budget for fuel. The estimated number of farm households is 149,797. Hence, 1 extension officer serves about 1,033 households.
Nakuru	489 but majority are currently in administrative duties and approaching the retirement age	2 (but some wards do not have any extension staff)	Extension staff recruitment is frozen. The estimated number of households is 381,175. Hence, 1 extension officer serves about 779 households.

Source: IEG field visit (July 2018).

Note: The number of farm households in each county is estimated based on the projected 2018 county population less the population in the main cities divided by five (as the average family size). This does not exclude medium and large farmers who can afford to pay for private extension services.

Appendix L. Status of Farmer Cooperatives Supported by KAPAP

Enterprise	Dormant	Semi-dormant	Partially Active (below capacity)	Vibrant	Total	Percent by Enterprise	Percent Vibrant	Percent Vibrant + Below Capacity + Semi-Active
Fruit Processing	5	0	0	0	5	10.2	0.0	0.0
Banana	1	1	0	1	3	6.1	33.3	66.7
Dairy	3	1	6	4	14	28.6	28.6	78.6
Dairy Goats	1	0	0	0	1	2.0	0.0	0.0
Fish	5	0	0	0	5	10.2	0.0	0.0
Grains	1	0	0	1	2	4.1	50.0	50.0
Honey	3	0	0	1	4	8.2	25.0	25.0
Horticulture	1	0	0	0	1	2.0	0.0	0.0
Investments	1	0	0	0	1	2.0	0.0	0.0
Potato	1	0	0	0	1	2.0	0.0	0.0
Poultry	5	0	0	0	5	10.2	0.0	0.0
Rabbits	1	0	0	0	1	2.0	0.0	0.0
Sorghum	1	0	0	0	1	2.0	0.0	0.0
Various activities	1	0	0	0	1	2.0	0.0	0.0
Vegetables growing and processing	2	0	0	0	2	4.1	0.0	0.0
African Bird Eye Chili	0	0	0	1	1	2.0	100.0	100.0
Mango	1	0	0	0	1	2.0	0.0	0.0
Total	33	2	6	8	49	-	-	-
Percent from total number of cooperatives (*N* = 49)	67.3	4.1	12.2	16.3	100.0	100.0	16.3	32.7

Source: IEG analysis based on data provided by Department of Cooperatives and Enterprise Development and IEG field visits.

Appendix M. Borrower Comment

MINISTRY OF AGRICULTURE, LIVESTOCK, FISHERIES AND IRRIGATION
STATE DEPARTMENT FOR CROP DEVELOPMENT
Office of the Principal Secretary

Telephone: 2718787
Fax: 725774
When replying please quote;

KILIMO HOUSE
CATHEDRAL ROAD
P.O .Box 30028
NAIROBI

REF: MOALF/KCSAP/GER/LET/VOL.1(12)

14th January,2019

The Country Director
World Bank Group
Delta Center, Upperhill
P.O Box 30577 00100
NAIROBI

RE: KENYA AGRICULTURAL PRODUCTIVITY PROGRAM (KAPP) IEG PROJECT PERFORMANCE ASSESSMENT REPORT

Attached herein, kindly find the comments from the Project Secretariat on the above for your consideration.

Prof. Hamadi I. Boga, PhD
Principal Secretary

1. **ISSUE 1: Achievement of the Objectives:**

    a. 4.25 (Pg. 29) since the technology generation and national research targeted many crops, livestock, animal diseases and fish production activities, the targeted enterprises for increasing yields were not clearly defined and varied across targeted counties.

    b. Pg. 34 … focused on Service Providers (SP) rather than farmers … (though citing a (World Bank 2016, Pg. 31-32).

    RESPONSE: The contracted SPs delivery system was demand driven and managed by farmers. Therefore, the statement that 'focus on SP rather than farmers' does not arise unless substantiated.

    c. Pg. 36 …. no evidence of diffusion, adoption and impact of these technologies by the beneficiaries …. no valuable data and evidence.

RESPONSE: The statement is very strong considering the existence of an Outreach and Partnership program of KALRO. It should be substantiated with clear supportive evidence.

2. **ISSUE 2: 4.41 (Pg. 36) … However, the envisaged Agricultural Research Fund (ARF) for enhancing sustainability of funding for agricultural research did not materialize.**

RESPONSE: The ARF could not have been established earlier because the legal framework (an Act of Parliament and regulations) was not in place. Subsequently, the responsibility of generating research funds was transferred from KALRO to NACOSTI.

3. **ISSUE 3: 4.42 (Pg. 37).** However, like KAPP I, KALRO continued to undertake highly diversified research activities covering multiple major and minor crops, livestock production, range management, animal health, biotechnology, and natural resource management. This has led to lack of focus in a few key areas, fragmentation of effort and several unfinished and terminated activities when the third phase of KAPP did not materialize.

RESPONSE:

- Research problems experience during the interface between KAPP Phase I and Phase II (KAPAP) and the failure of KAPP to proceed to Phase III were directly related to policy and project design and not the multiplicity and diversity of the KARI/KALRO research programmes.

- The diverse KALRO research activities both in crops, livestock and NRM address real needs of the different Kenyan communities. It is therefore not clear how KALRO was to focus on a narrow research agenda.

4. **<u>ISSUE 4:</u> 4.50 (Pg. 39) there is no evidence, however, to support the claim made in the ICR (World Bank 2016) that average income increased by 59.51 percent for male farmers (from KES130,207 to KES 207,693) and by 67.94 percent for female farmers (from KES 78,481 to KES131,801). How did the reviewer arrive at the 30 percent figure?**

<u>RESPONSE:</u> The ICR report referred to, did a comprehensive review of the field activities before establishing the percentages given. What data did the current reviewer use to discount the earlier findings? This question is being raised in view of the fact the time allocated for this evaluation was inadequate and the field visits were limited.

5. **<u>ISSUE 5:</u> 4.64 Overall Bank performance is rated Moderately Unsatisfactory; and 4.65 Borrower Performance is rated Moderately Unsatisfactory**:

<u>RESPONSE:</u> We concur.

6. **<u>ISSUE 6:</u> 4.66 Implementing Agency Performance is rated Moderately Unsatisfactory:**

<u>RESPONSE:</u>

a. Internal capacity weaknesses in project and financial management persisted throughout implementation …... there were changes.

b. The key performance indicators were reviewed and adjusted.

c. The cooperatives were registered as a condition to receive grants rather than based on demand-driven and a bottom-up process of change to formalize the association …… The cooperatives were not formed to receive funds they were formed as a sustainability exit strategy to

empower the Common Interest Groups (CIGs), increase their capacity to borrow, optimize on economies of scales.

d. At completion stage of the project, most of the cooperatives were at the storming stage of group formation. Therefore, sense of ownership and viability of the cooperatives is towards group dynamics.

7. **<u>ISSUE 7:</u> Like phase I, the research by KARI/KALRO lacked focus and strategic direction:**

<u>RESPONSE:</u>

a. With the support of the project, KARI developed a well-focused Agricultural Research Strategic Plan.

b. During the project period, KARI was able to undertake all the necessary reforms and activities anticipated except the establishment of the Agricultural Research Trust Fund (ARF).

c. The upgrading of the KALRO ICT facilities to WAN and LAN was complete and equipment … Development of the National Agricultural Research System (NARS) policy and its adoption was achieved in 2012; Agriculture Research and Livestock Act was approved by the Parliament in 2013; and subsequently established KALRO.

d. Regarding weak research and extension linkages, KALRO created a department, Outreach and Partnership to address the gap and within that period, KARI developed a model for piloting Innovation Platform jointly tested by KARI and KAPP.

8. **<u>ISSUE 8:</u> 4.68 Overall, borrower performance was *Moderately Unsatisfactory***

<u>RESPONSE:</u>

a. The rating is heavily focused on the project performance before Mid-Term Review (MTR), and the MTR results and findings.

b. Statement on M&E system designed being done late is not correct. By project mid-term the M&E (PMIS) system was already in place.

c. Support to the NARS and KARI/KALRO achieved a lot of results: - NARS Policy of 2012, Kenya Agricultural and Livestock Research Act No. 17 of 2013; hence; establishment of KALRO, which replaced KARI shaping the

context of implementation, its achievements and the sustainability of its outcomes.

d. Devolution had no direct effect to the projects and did not affect the coordinating structures of the project since they remained at the National Government.

CONCLUSION:

The Project (KAPAP) rating is an underestimation of the project's achievement after the post the Mid-Term restructuring. The first two project evaluation clearly took this into account. The project implementation rating should be revised more favorably considering the highly significant achievements made after MTR. Based on this, Moderate Satisfactory would be a better rating