



1. Project Data

Project ID P112688	Project Name Eastern Africa Agricultural Productivity	
Country Africa	Practice Area(Lead) Agriculture	
L/C/TF Number(s) IDA-45670,IDA-45680,IDA-45690,IDA-46720	Closing Date (Original) 27-Feb-2015	Total Project Cost (USD) 90,000,000.00
Bank Approval Date 11-Jun-2009	Closing Date (Actual) 31-Dec-2015	
	IBRD/IDA (USD)	Grants (USD)
Original Commitment	90,000,000.00	0.00
Revised Commitment	119,749,349.27	0.00
Actual	119,695,400.40	0.00

Sector(s)

Agricultural Extension, Research, and Other Support Activities(80%):Agricultural markets, commercialization and agri-business(10%):Public Administration - Agriculture, Fishing & Forestry(10%)

Theme(s)

Rural services and infrastructure(60%):Rural policies and institutions(23%):Regional integration(17%)

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2. Project Objectives and Components

a. Objectives

The Eastern Africa Agricultural Productivity Project (EAAPP) was proposed in the Project Appraisal Document (PAD) as the first five year phase in a program of two Adaptable Program Loans (APLs). The program's objective was to "contribute to increased agricultural productivity and growth" (PAD, paragraph 18) in Ethiopia, Tanzania and Kenya. Uganda joined the program's first phase four months after the other three countries.

The Project Development Objective (PDO) for EAAPP's first phase defined in the PAD was to: "(i) enhance regional specialization in agricultural research; (ii) enhance collaboration in agriculture training and dissemination; and (iii) facilitate increased sharing of agricultural information, knowledge and technology across Recipients' boundaries" (paragraph 28)..



The PDO in the Financing Agreement (FA) for EAAPP was almost the same, namely: “(i) enhance regional specialization in agricultural research; (ii) enhance regional collaboration in agricultural training and dissemination; and (iii) facilitate increased sharing of agricultural information, knowledge and technology, across the Recipient’s boundaries.”

The Grant Agreement’s definition emphasized “regional collaboration” in part (ii) whereas this emphasis was absent from the PAD’s definition. In line with the ICR Review Guidelines, the PDO in the Grant Agreement will be used to assess the extent to which the project has achieved its objectives.

- b. Were the project objectives/key associated outcome targets revised during implementation?

No

- c. Components

The project had four components. All of them were aimed at achieving the project’s objectives in each participating country. According to the PAD (paragraphs 16, 18 and 21) the lead countries for the main lines of research were Ethiopia (wheat), Tanzania (rice) and Kenya (dairying). Uganda, which joined the program later than the other countries, led the research on cassava.

Component 1: Strengthening Regional Centers of Excellence (RCoEs); (appraisal cost US\$27.4 million; actual cost US\$30.47 million). This component was aimed at strengthening the institutional capacities that were needed to establish Regional Centers of Excellence (RCoEs). Capacity strengthening would focus on the physical facilities and human resources needed to sustain program objectives and outcomes at both the regional and national levels. There were two sub-components:

(a) Support to research infrastructure. This subcomponent would fund the rehabilitation and modernization of the selected research centers. It would entail the rehabilitation of infrastructure for regional training, greenhouses, irrigation facilities for research and seed multiplication activities, laboratory equipment, vehicles and farm machinery, library materials, as well as software and hardware to support an information system that will facilitate regional networks.

(b) Human resource capacity building. Graduate training at the MSc and PhD levels would also be financed in technical and social aspects pertinent to the program objectives. Where possible, MSc training would be at local universities while PhDs would be trained locally and abroad, with thesis work done within country through sandwich programs.

Component 2: Support to Technology Generation, Training and Dissemination (appraisal estimate US\$53.4 million; actual cost US\$47.70 million). This component will support technology generation, training, and dissemination that has been agreed at national and regional levels as evidenced by inclusion in an annual regional research plan for each commodity and for training and dissemination. Regional plans will be developed and agreed through regional meetings convened by the Association for Strengthening Agricultural Research in East and Central Africa (ASARECA) Research, training, and dissemination activities will cover the whole spectrum of the value chain—from basic production to postharvest handling, marketing, processing, and consumption.

Component 3: Improved Availability of Seeds and Livestock Germplasm (appraisal cost US\$29.4 million; actual cost US\$29.67 million) This component would support multiplication of seeds and breeds, strengthen the enabling environment for regional seed and breed trade, and improve the capacity of seed and breed producers and traders. Support would be targeted at the commodities selected in the RCoEs.

Component 4: Project Management and Coordination (appraisal cost US\$9.8 million; actual cost US\$11.00 million). This component provided funds to finance management and coordination at the national and regional levels.

- d. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Project Costs: The original project cost for this first phase project shown in the PAD was US\$90 million. However, after Uganda joined Phase 1 of the project and following final negotiations between the Bank and the four participating countries, the total appraised project cost was US\$120 million. According to Annex 1 (a) in the ICR the actual total cost was US\$119.72 although Section 1 of this template indicates that the actual cost was US\$119,695,400 as recoded in the project portal. .

Financing: All direct project financing was provided by the International Development Association.

Borrower Contributions: There was no mention of financial contributions to project by participating countries in Annex 1 of the ICR. However, the PAD makes it clear that the Association for strengthening Agricultural Research in Eastern and Central Africa (ASARECA) and the four governments all undertook to make financial contributions to the project’s implementation through separate agreements with ASARECA (Annex 6, paragraph 3). The ICR provides no information on the agreements between ASARECA and the participating



countries. ASARECA (financed by a multi-donor trust fund) was expected to obtain an additional \$10 million per year from the trust fund by virtue of its participation in the EAAPP. In addition, under the World Bank Operation Policy, governments made commitments to have and maintain adequate financial systems throughout the project implementation period, to include budgeting, accounting, internal controls, funds flow, financial reporting, and auditing arrangements to ensure they can readily provide accurate and timely information regarding project resources and expenditures, as well as to establish procurement systems in line with World Bank guidelines. However there is no information in the ICR on commitments or expenditures by governments to finance the implementation of these fiduciary responsibilities.

Dates: The US\$120.0 million IDA Credit was approved on June 11, 2009 for Ethiopia, Kenya and Tanzania. It was approved on November 12, 2009 for Uganda. The mid-term review (MTR) was held in November 2012. The original closing date for Phase 1A (Ethiopia, Tanzania and Kenya) was February 27, 2015 and for Phase 1B (Uganda) was June 30, 2015. Both these closing dates were extended to December 31, 2015.

Restructuring: The first project restructuring was on July 29, 2013 funds were reallocated between expenditure categories and components. These reallocations of funds formalized the reallocations were agreed during the MTR according to countries' own priorities – as follows:

- In Ethiopia funds were moved to scale up extension of technologies to farmers, focus on strengthening marketing value chains, and on deepening regional integration.
- In Tanzania funds were reallocated to strengthen the Regional Center of Excellence and upgrade the institutional and technical capacities of the Tanzania Official Seed Certification Institute.
- In Kenya reallocations were aimed at strengthening research and extension links and to increase support to agribusiness and marketing.
- In Uganda funds were reallocated to scale up technology dissemination, training, seed production and their distribution modalities, marketing linkages to ensure a greater impact for a wider range of farmers.

The project team clarified that the strengthening of agribusiness was through training and assistance with decisions on capital investments by small scale enterprises (e.g. seed merchants, bakeries and raw milk collectors) to develop value chains to improve their efficiency was an integral part of the project and measured by one of the intermediate outcome indicators. These enterprises were relevant to the improvement of demand for agricultural products and hence provided the incentives for farmers to use improved technologies to deliver products to various enterprises.

The PDO indicators were revised during the MTR to “better capture the PDO” (ICR, paragraph 28). This led to a formal restructuring of the results framework including “two indicators to explicitly capture the specialization and cross border technology sharing elements of the PDO: the ‘Rate of change in regional specialization and collaboration in agricultural research’ and ‘Rate of increase in information and knowledge transfer across national boundaries’ ” (ICR, paragraph 31).

The original and revised indicators were summarized in Table 1 in the ICR. However most of the final indicators were not relevant to measuring the extent to which the project's objectives were achieved. The ICR acknowledges that “Several PDO indicators went beyond the PDO, including ‘adoption of new technologies’, ‘land area under improved cultivars’, and ‘increase in productivity at farm level’. Instead of measuring the PDO directly, these measured the expected downstream benefits if the PDO were achieved” (paragraph 32). The changes in the outcome indicators did not justify a split rating for an assessment of the project's outcome because changes in the indicators made no material difference to measuring the extent to which the PDO was achieved. They merely provided an alternative measurement tools compared with the indicators defined in the PAD.

The second restructuring was on November 5, 2015 when the project closing dates for Phases 1A and 1B were both extended to December 31, 2015.

3. Relevance of Objectives & Design

a. Relevance of Objectives

In 2003 the Africa Union Summit declared that the Comprehensive Africa Agriculture Development Programme (CAADP) - an integral part of the New Partnership for Africa's Development (NEPAD) - was Africa's policy framework for agricultural transformation, wealth creation, food security and nutrition, economic growth and prosperity for all. Pillar IV of the CAADP policy framework emphasizes activities to improve agriculture research, technology dissemination and adoption. EAAPP objectives for the agricultural sectors in the four focus countries reflected the CAADP framework which was also consistent with contemporaneous World Bank Group (WBG) country assistance strategies (CASs) and country partnership strategies (CPSs). For example World Bank CASs and CPSs for Tanzania (FY2007-2010), Ethiopia (FY2008-2011), Kenya (FY2010-2013) and Uganda (FY2011-2015) all included references to enhanced agricultural research, improved agricultural extension and increased agricultural productivity as important strategic priorities. These priorities were also congruent with the objectives of the New Partnership for Africa's Development (NEPAD).

In addition, the PAD noted that “EAAPP supports the objectives of the World Bank's Africa Action Plan (2015), which identifies regional



integration as an important element to achieving higher economic growth and poverty reduction. It is also part of a larger commitment by IDA to assist countries to enhance long-term food availability by providing a mix of support for short-term supply responses and sustainable medium and longer-term investments in agricultural productivity” (paragraph 12).

According to the PAD, at the regional level EAAPP also provided a vehicle for implementing the agricultural productivity agenda of the Association for Strengthening Agricultural Research in East and Central Africa (ASARECA), which was created to enhance regional collective action in agricultural research for development, extension, training, and education. Indeed ASARECA has been mandated by the Common Market for Eastern and Southern Africa (COMESA) and the Forum for Agricultural Research in Africa (FARA) to take a lead in coordinating implementation of Pillar IV in CAADP’s policy framework and the application of the principles of the FARA in East Africa. The PAD noted, inter alia, that “The total number of agricultural scientists in public institutes was similar in Africa and in the United States, but the average number of scientists per institute was only 30 in Africa, compared to 180 in the United States. The dispersion of agricultural scientists across so many small institutes in Africa was impeding the assembly of the critical mass of researchers needed to address inherently complex problems” (paragraph 6). The conclusion from this comparison was that a “The remedy for fragmentation and the problems associated with small countries is regional integration to create a largely shared technology space” (PAD, Annex 1, paragraph 24). This Review would add that this conclusion underlined the relevance of the need for “specialization”, “collaboration” and “dissemination” as core integrated elements in the project’s development objectives.

This Review therefore concludes that EAAPP’s three objectives were elements of a process which were highly relevant for the first phase of a program to strengthen regional agricultural research institutions, their collaboration, and the dissemination of improved technology. In this sense the project’s objectives were also highly relevant to the four countries’, ASARECA and the World Bank’s current development strategies.

Rating

High

b. Relevance of Design

The project’s activities focused on strengthening the regional centers of excellence (RCoEs), regional collaboration in the generation of agricultural technology and its dissemination as well as training, and facilitating increased sharing of agricultural information, knowledge and technology, across the boundaries of participating countries. The activities, embodied in the project’s components for which appraisal and actual expenditures are listed in Section 2c above, were **substantially relevant** to the project’s three development objectives. Specifically, the project’s activities were aimed at;

(a) Strengthening RCoEs – the intention was to achieve regional specialization of research activities and thereby raise the possibility of important technological breakthroughs which were relevant for all four countries.

(b) Supporting technology generation, training and dissemination – the intention was that annual regional research planning for each main commodity included in this project would make it possible to enhance regional collaboration in agricultural training and dissemination strategies for these commodities to farmers as well as training and dissemination of knowledge on marketing value chains for agricultural commodities to small scale enterprises.

(c) Facilitating the increased sharing of agricultural information, knowledge and technology across country boundaries – facilitation (e.g. certification of seed cultivars and livestock germplasm) and dissemination of knowledge would improve the availability of seeds and germplasm across country borders.

By mutual agreement the four participating countries gave varying emphasis to the three activities. However, a core feature of the project’s design was that research results would be available to all countries regardless of where the research was performed.

The project’s results matrix in the PAD (Annex 3) had shortcomings because it merely showed in the first column the program objectives (not an objective for this project), the three PDOs and the four components. In the second column there was a listing of the indicators for the program, PDOs and components. There was a third column which provided comments on the indicators. The results matrix did not reflect the project’s design because it failed to reveal a results chain, namely how actions by various institutions in the participating countries would carry out their specialized responsibilities in centers of excellence and collaborate to achieve the project’s objectives. As noted already in Section 2d of this Review the results matrix (Annex 3) was amended at the mid-term review (MTR) to “better capture the PDO” (ICR, paragraph 28). However, the basic inadequate structure of the results matrix remained unchanged.

Nevertheless, given this Review’s agreement with the high relevance of the project’s design as described in the PAD, the overall relevance of design is rated substantial at appraisal, as well as during project implementation and when the project closed.



Rating
Substantial

4. Achievement of Objectives (Efficacy)

Objective 1

Objective
Enhance Regional Specialization in Agricultural Research.

Rationale
Outputs

- **Regional Research Infrastructure:** Acquisition of research infrastructure and equipment according to plan in Regional Center of Excellence (RCoEs). The achievement was 199.8 percent compared with a target of 100 percent. (Annex 2, Table 2.1a). However, much of the infrastructure was not completed until the project was almost closed.
- **Research Scientists: Increasing** the number of research scientists working in regional research projects was achieved almost as planned. The number was 834 compared with a target of 904 – an 85 percent achievement (Annex 2, Table 2.1a). However, while the real success was achieving a critical mass of more than 30 research scientists per regional research center, there is no information in the ICR the quality of the increased staff.
- **Area of New Cultivars:** The rate of increase in land area with seeds from improved cultivars (new stable plant varieties bred through cultivation and selection) exceeded its target with a 15.12 percent increase compared with a target of 14.0 percent (ICR, paragraph 46). However, it is not clear from the ICR how the farmers were selected (in terms of who received the new stable plant varieties and whether these beneficiary farmers represented the "average" farmer in terms of their conditions e.g. land, capital, machinery, knowledge).
- **New Regional Technologies:** The number of new production technologies (technologies, innovations and management practices – TIMPs) developed by RCoEs was 472 compared with a target of 534 (ICR, paragraph 21 and Annex 2, Table 2.1a). The ICR states that some of these TIMPs were still being developed (paragraph 22); and that only 76 were disseminated to one or more countries. While the ICR provides some information on stakeholder satisfaction with available TIMPs (Annex 2, Table 2.1-b) and on the impact of higher yields of wheat, rice and dairying (Annex 2, Table 2.2), it provides no analysis of the extent to which the 472 TIMPs can be attributed to this project rather than to research that was already part of an existing research program. Nor does the ICR make any estimate of the relative importance or value added of the 76 TIMPs which were disseminated to farmers and to the growth of the agricultural sector in the participating countries. Learning which TIMPs were not relevant or could not be applied would have been just as important as knowing which TIMPs worked, and were adopted and applied by farmers effectively.

Outcome

- **Achievement of Regional Specialization:** Essentially the objective was leadership on specified fields of research by participating countries. Essentially Objective 1 was aimed at achieving leadership on specified fields of research by participating countries.
- **Achievement of Regional Specialization in Agricultural Research:** The rate of change in regional specialization and collaboration in agricultural research measured by combining five sub-indicators (defined in Box 1 in the ICR) was estimated at 73.75 percent compared with a target of 72.5 percent (ICR, paragraph 44). Meeting this target for this composite indicator meant that the objective of regional specialization in agricultural research (for the four countries) was substantially achieved during implementation.

Rating
Substantial



Objective 2

Objective

Enhance Collaboration in Agriculture Training and Dissemination

Rationale

Outputs

- **Colla**
- **Collaboration in Regional Facilities:** Regional Facilities were designed and built to facilitate strong collaboration and an effective working environment for agricultural research and development (AR&D) professionals, EAAPP was promoting agricultural research and development through funding cross border exchanges of staff and technologies, the provision of critical, state of the art laboratory technology, training and other support (ICR, para 21)
- **Capacity Building for Research:** The number of targeted stakeholders (e.g. research institutions, extension services) whose capacity building needs were addressed indicated enhanced collaboration. The number of stakeholders reached (735,000) far exceeded the target of 103,000 (ICR, paragraph 47). The same paragraph in the ICR also noted that the level of stakeholder satisfaction with the available TIMPs “uptake pathways” (another indicator of successful collaboration). The target of 82.5 percent for this indicator was substantially achieved according to the survey by the “Phase 1 Evaluation” (79.3 percent). However, it is not clear how the 735,000 benefitted from the project – other than they apparently stated that their “capacity building needs had been addressed” and that they were satisfied.
- **Training of Research Staff:** 1,932 staff received short and long term training and applied skills acquired through EAAPP funded agricultural research. This achievement compared with a target of 1,743 staff. (Annex 2, Table 2.1a), but there is no information in the ICR on the impact of the training other than by implication through the number of new technologies (TIMPs) developed.
- **Regional Projects/Cross Border Exchange:** Of the 33 agricultural research projects implemented 23 (70 percent) were carried out in all four EAAPP countries and 9 (27 percent) were carried out in three countries. The requirement was to have a minimum of two countries for each sub-project, so the project exceeded the minimum in 97 percent of the cases and demonstrated a commitment to cross border exchange (ICR, paragraph 49 and Table 4).

Outcomes

There were two areas which Objective 2 focused on, namely enhanced collaboration and in the development of improved technologies that could be disseminated.

- **Enhanced Collaboration:** The rate of change in regional specialization and collaboration in agricultural research measured by a composite indicator generated by combining five sub-indicators (defined in Box 1 in the ICR). This indicator was estimated at 73.75 percent compared with a target of 72.5 percent (ICR, paragraph 44). Despite the definition of this indicator as a “rate of change” the task team leader confirmed that it was actually a percentage change. Meeting this target meant that the objective of regional collaboration in agricultural research (for the four countries) was met substantially during implementation.
- **Satisfaction with Technologies, Innovations and Management Practices (TIMPs):** The proportion of stakeholder satisfied with the available technologies, innovations and management practices and uptake pathways also indicated successful collaboration and the target for this indicator was substantially achieved. The actual achievement of 67.1 percent satisfied compared with target of 75 percent (determined through surveys as part of the “Phase 1 Evaluation” and reported in the ICR, paragraph 46). There was, however, no information in the ICR on how “satisfaction” was measured or tested.

Rating

Substantial

Objective 3

Objective

Facilitate Increased Sharing of Agricultural Information, Knowledge and Technology

Rationale

Outputs



- **Sharing of Technologies among Countries:** According to the ICR the number of existing and new technologies disseminated in more than one EAAPP country was 150 compared with a target of 71 (paragraph 49 and Annex Table 2.1b), but the process for sharing knowledge and the results was not spelled out in the ICR.
- **New Cultivars Registered:** 29 new cultivars (new stable plant varieties bred through cultivation and selection) were registered in more than one EAAPP country compared with a target of 35 (Annex 2, Table 2.1b). However the ICR provided no information on subsequent actions or achievements such as seed multiplication after the registration of the cultivars.
- **Improvements in Productivity:** The ICR summarized improvements in the productivity of the three focus crops and dairying in the participating countries (paragraphs 51 to 58). Irrespective of whether improvements in productivity were relevant to the sub-objective considered here, there was no evidence in the ICR that productivity increases were attributable in the whole or in part to the research financed by the project.
- **Establishment of Agribusiness:** The number of agribusiness units established/strengthened was 270 compared with the target of 172. This result suggests that specialization was achieved because the number of agribusinesses based on the commodity of specialization for each country was well beyond expectations. Each agribusiness group was involved in a specific aspect of the commodity’s production, processing or marketing along its value chain. Accordingly, different groups were organized for milk, cassava and wheat value chains (ICR, para 45). However there is no evidence in the ICR regarding the impact of the increased agribusiness established or strengthened on producers or other value chain participants including who benefitted.
- **Business Incubation:** According to the ICR the business incubation process supported by the project in Uganda assisted the groups in getting specialized training on the relevant segment of the value chain. This process enabled agribusiness groups to focus on a specialized skill and benefit from it (ICR, para 45).

Outcomes

- **Increased Sharing of Information, Knowledge and Technology:** The “rate of increase in information and knowledge transfer across national boundaries” was 72.5 percent compared with a target of 85 percent (ICR, paragraph 48). While this outcome target was missed there were other shortcomings in the expected achievement of outputs (e.g. the dissemination of only 76 TIMPs compared with the 472 the ICR states were developed) that together led this Review to rate the achievements against this sub-objective as modest.

Rating
Modest

5. Efficiency

Recalling again that the project’s objectives were to: (i) enhance regional specialization in agricultural research; (ii) enhance collaboration in agriculture training and dissemination; and (iii) facilitate increased sharing of agricultural information, knowledge and technology across Recipients’ boundaries” were all institutional objectives. They were aimed at strengthening the capacity of four participating countries to undertake agricultural research and disseminate results to farmers. The efficiency with which these objectives were achieved is inherently difficult because of measurement challenges.

Analysis of Project Efficiency. Neither the PAD nor the ICR analyzed the efficiency with which these objectives were achieved. Rather, both documents focused on various outcomes of the research programs such as new crop varieties, their potential impact on higher yields and farm incomes. However these outcomes were not the project’s objectives, despite the fact that some of the project development indicators also sought such results. While, this section will briefly describe the analysis of efficiency in the PAD and the ICR, the main emphasis for this Review will be measurement of the efficiency with which research and extension institutions achieved regional specialization, collaboration and dissemination.

Evidence in the PAD on Efficiency in Agricultural Research Projects

The PAD presented an array of evidence based on (a) studies in various regions of the world which focused on rates of return from rice



and wheat research (see PAD, Annex 9, paragraph 9), (b) a “minimum incremental benefit stream” approach to justify the proposed EAAPP investment; and (c) an “incremental adoption” model to assess whether the proposed project could, under a reasonable set of operating assumptions, produce a desired minimum rate of return or minimum benefit stream (PAD, Annex 9, paragraph 14).

a . **Rates of return:** The evidence for rice indicated high rates of return on the costs of research ranging from 18-26 percent for mangrove rice in West Africa and in the range of 50-65 percent in Senegal PAD, paragraph 7).

b . **Minimal national impact.** This analysis was based on a number of assumptions concerning additional production costs (assumed to be a third of the percentage increase in farm yield), yield and output prices (PAD, paragraph 16). The PAD estimated the minimum annual growth rates in farm yields required to achieve an internal rate of return (IRR) of 14 percent over a project life of 20 years was 0.3 percent for rice in Tanzania, 0.315 percent for rice in Kenya and Ethiopia, 0.14 percent for wheat in Kenya, and 0.1 percent wheat in Tanzania and Ethiopia (PAD, paragraph 16) **check..**

c . **Incremental adoption.** The main conclusions were that the IRRs achieved were 21 percent for rice in Tanzania, 19 percent for rice in Kenya and Ethiopia, 27 percent for wheat in Ethiopia, 28 percent for wheat in Tanzania and Kenya, and 32 percent for dairying in Kenya – all greater than a reasonable discount rate.

Analysis in the ICR of the Efficiency of EAAPP

The ICR used estimates of (a) incremental crop incomes per farm household per year, and (b) a benefit cost analysis.

a . **Incremental crop incomes.** Using the analysis of efficiency in the End Line Phase 1 Evaluation for EAAPP the ICR presented average incremental real net crop incomes for farm households which were direct beneficiaries and non-beneficiaries of the project (Annex 3, Tables 3.1 and 3.2). The average incremental real net crop income for producers of the three key crops covered by the project were substantial. However the incremental real net income for dairying was negative. The average incremental net value of production (beneficiaries compared with non-beneficiaries) for farm households were \$307, \$175 and \$391 per year for wheat, cassava and rice respectively.

b . **Benefit/Cost analysis.** The estimated number direct project beneficiaries was 108,633 for wheat; 245,251 for cassava; and 265,125 for rice (EAAPP/ASARECA M&E 2015) for a total of 421,141 direct beneficiaries. Of these, the proportions reporting increased output/income as a result of taking up improved technologies were 29 percent for wheat producers, 46 percent for cassava and 68 percent for rice. The total net annual incremental value of the increased production by beneficiaries in 2014 over the non-beneficiaries compared with 2009 was estimated at \$9.68 million for wheat producers, \$19.93 million for cassava growers and \$70.65 million for rice producers. This represented a total net increase in the value of agricultural production of US\$100.3 million for the three crops. Dairying, with a negative incremental real rate of return was not counted. Since total project costs were approximately \$120 million the ICR asserted that project benefits would equal project costs in about 1.2 years.

However, the benefit/cost analysis raised two issues. First, although increased productivity and incremental incomes were an important expected benefit from the project, this was not the project’s core objective. Hence an analysis of this aspect of the project’s efficiency was irrelevant to the Phase 1 objective. Second, there was no assessment of the additional costs that may have been incurred by the four participating governments from their own budgets to support regional specialization in research and in collaboration as well as their contributions to additional extension programs. While neither the End of Phase 1 Evaluation nor the ICR provided an estimate of additional government counterpart costs, the data on incremental net economic benefits suggest that even if all additional government costs had been included in the analysis the overall benefit/cost ratio would still have been higher than unity.

Benefits and Costs of an Improved Regional Institutional Framework for Regional Agricultural Research

It was a challenge for the ICR to assess the efficiency with which the regional institutions achieved project’s development objective of enhancing regional specialization in agricultural research, collaboration and dissemination in the four participating countries.

In theory the efficient research frontier for any crop or product is determined by different combinations of skilled labor (research staff) and capital (working and fixed capital or equipment). The economically most efficient combination of labor and capital is determined by their relative unit costs or prices. Assessing such combinations is possible but analytical precision is typically constrained by the lack of adequate data. Nevertheless it should have been possible to explore technical efficiency and cost effectiveness of research staff allocations and research budgets for regional centers of excellence where the focus on research was unique.

A number of possible approaches can be listed:

(a) Did the average number of scientists in regional centers of excellence research institutions increase from the average of 30 which the PAD noted was inadequate (paragraph 6) because it did not represent a critical mass of scientists and was arguably inefficient? The aggregate number of research scientists “working in regional research projects” in Table 2.1 of Annex 2 in the ICR did not answer this question.

(b) Was it not possible for the ICR to assess the cost effectiveness of research for some sample technologies with and without the project?

(c) What made specialization in agricultural research in regional centers of excellence more efficient than before these centers were established.

(d) Could the ICR have compared the number of new production technologies developed, or cultivars registered, in the region in a period before the project started with the period during which the project was implemented?

(e) What were the benefits and costs of the large training program or, alternatively, was the large training program cost-effective?

Summary: This Review concludes that (a) the analysis of efficiency in the ICR was irrelevant to assessing whether the project’s objectives were achieved efficiently; and (b) the results of some of the analyses of institutional efficiency among those suggested above



could have provided significant insights into the efficiency with which the project’s objectives were achieved. In light of the absence of a relevant efficiency analysis, but at the same time not rejecting the proposition that the project improved the efficiency of institutions associated with the project, its efficiency is rated as modest.

Efficiency Rating
Modest

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal		0	0 <input type="checkbox"/> Not Applicable
ICR Estimate		0	0 <input type="checkbox"/> Not Applicable

* Refers to percent of total project cost for which ERR/FRR was calculated.

6. Outcome

The relevance of the project’s objectives and design were rated, respectively, high and substantial. Efficacy of the enhancement of regional specialization of agricultural research was rated substantial because, although it was not clear that a critical mass of research staff had been established in the centers or the extent to which research results were relevant to the challenges facing farmers, participating countries had established Centers of Excellence and delivered TIMPs. The efficacy of regional collaboration in agricultural training and dissemination was also rated substantial because there was evidence of successful collaboration among country research establishments in training and dissemination at the regional levels. On the other hand the efficacy of facilitating increased sharing of agricultural information, knowledge and technology, across the four country boundaries was rated modest because the target for the indicator for this objective was not met and there were other shortcomings in the achievement of this objective. The assessment of efficiency in the ICR was not relevant and therefore efficiency was rated modest. Overall the project had moderate shortcomings in its achievements and the project outcome is therefore rated as moderately satisfactory.

a. Outcome Rating
Moderately Satisfactory

7. Rationale for Risk to Development Outcome Rating

The core risk to EAAPP’s Phase 1 development outcome achievements depended on whether the participating countries would continue to support regional centers of excellence and collaboration in research - irrespective of the funding of a Phase 2 project which was foreshadowed in the PAD.

This project was originally conceived as Phase 1 of a ten year Adaptable Program Loan program (PAD, paragraph 16). However, when the World Bank announced at the close of the first phase that it would not provide funding for Phase 2 the project’s Steering Committee met in December 2015 and agreed to a strategy for continued inter-state collaboration in the EAAPP program (ICR, paragraph 38). The statements by each participating government in Annex 7 of the ICR reflect their conclusions that EAAPP was a valuable project and they intended that the project’s specialization through the Centers of Excellence and collaboration on research and dissemination would continue despite the Bank’s decision not to fund the second phase. However, there is no evidence in the ICR that the participating countries would provide adequate



financial support for the continuation of the specialization and collaboration on agricultural research achieved under Phase 1.

The ICR noted that “A review by the Bank and ASARECA showed that the triggers to proceed to Phase 2 were met by all four countries” (paragraph 29), but the ICR provided no evidence regarding the extent to which the triggers were fulfilled. Irrespective of this lack of evidence, meeting the triggers was not itself evidence that participating countries would be able to generate adequate financing to support the sustained implementation of Phase 1.

The Bank’s original decision not to finance Phase 2 was recently reversed and IEG was advised by the project team that the next phase of the project is being appraised. Nevertheless, until the continued program of specialization and collaboration has been agreed and sufficiently funded and the boost in the number of research staff in participating countries is maintained, the sustainability of the project’s first phase achievements is still a high risk. This Review therefore rates the risk to the development outcomes of Phase 1 as high.

- a. Risk to Development Outcome Rating
High

8. Assessment of Bank Performance

a. Quality-at-Entry

The Bank, along with ASARECA and the Common Market for Eastern and Southern Africa (COMESA), coordinated a series of discussions with the four participating countries regarding the concept of regional coordination of agricultural research and the prospect for commodity specialization and arrangements for collaboration in training and dissemination. Uganda, though part of the discussions, became a full participant later than the three other countries because of difficulties in agreeing on the commodity of specialization. Eventually the Government of Uganda agreed to take the leadership on specialization in cassava research which was highly valued by all countries including some outside of EAAPP. In preparing EAAPP, the Bank used the experience of Phase 1 of the West Africa Agricultural Productivity Program (WAAPP) to guide the design of EAAPP. WAAPP has already moved to a second phase. A testament to the project’s careful preparation and appraisal was the fact that the project’s objectives and components needed no amendment. In addition, as designed, all participating countries contributed to the close collaboration and coordination of their activities.

A moderate shortcoming in the project’s quality at entry was the results framework in the PAD because, although it listed the project’s indicators, it did not reflect the project’s design. The revision of the results framework at the mid-term review did not rectify its shortcomings.

Quality-at-Entry Rating
Moderately Satisfactory

b. Quality of supervision

The World Bank, in close coordination with ASARECA, fielded 11 supervision missions (typically two per year) to support the project’s implementation. Task team leaders from the Bank were assigned to each country and there was daily support from the individual country offices. The mid-term review (MTR) for the project was an opportunity to make adjustments to the project’s management and consequently the course of implementation. The allocation of funding was restructured to respond to the demand for scaling up activities in key areas. The PDO indicators were amended to ostensibly measure the project’s progress more accurately being made toward the achievement of the PDOs and inter alia to ensure that the four participating countries would measure progress appropriately following an agreed methodology. One aspect of the Bank’s supervision that caused considerable dismay and disruption among participating countries was the Bank’s announcement at the project’s close that it would not provide funding for Phase 2. Fortunately 1.5 years later this decision has recently been reversed but the Bank’s reputation among participating countries as a reliable development partner suffered.

The ICR stated that field interviews by the ICR preparation team revealed praise from staff in participating countries regarding role of the Bank as supervisor and of ASARECA as coordinator for the project.

Quality of Supervision Rating
Satisfactory

Overall Bank Performance Rating



Moderately Satisfactory

9. Assessment of Borrower Performance

a. Government Performance

According to the ICR the four participating governments provided overall good support and commitment to EAAPP and showed a willingness to learn about the benefits from regional cooperation. The main weakness was the slow process in establishing the modalities for sharing technology and in moving forward on research protocols, and in seed certification which was necessary for the sale of seeds across country borders (paragraph 77). The participating governments made significant contributions through their membership of the project's Steering Committee which was appointed during the mid-term review and subsequently facilitated cross border sharing of technologies, innovation and management practices (TIMPs) and a focus on the whole agricultural value chain, which led to scaling up of seed multiplication activities. It should also be noted that when the Bank announced at the project's close that it would not provide funding for Phase 2 the Steering Committee met in December 2015 and established a strategy for continued inter state collaboration on the EAAPP program (ICR, paragraph 38). The statements by each participating government in Annex 7 of the ICR reflect their conclusions that EAAPP was a valuable project. As a result the governments of Kenya, Tanzania and Uganda requested that the Bank support Phase 2 of the program.

Government Performance Rating
Satisfactory

b. Implementing Agency Performance

There were two groups of implementing agencies. One group composed of regional organizations. Among these ASARECA played an important role in coordinating EAAPP activities in different countries. The ICR stated that this role compensated for the lower level of involvement and experience of other the regional organizations that all had an interest in this project. The ICR noted in paragraph 24 that the coordinator in ASARECA was replaced during implementation to improve the coordinating function. The other group was made up of national institutions for research and extension which, according to the ICR, were "firmly committed to the program, took pride in its accomplishments and have strongly sought Phase 2" (paragraph 78). The research organizations also made strategic use of the high level training and scientist exchanges. The ICR stated that the research organizations "delivered higher than expected results in many cases and demonstrated true ownership of the EAAPP approach" (paragraph 78). The four governments were also responsible for financial management and procurement (ICR, paragraph 25). The Regional Centers of Excellence (responsible for implementing the M&E program) delivered on their responsibilities with detailed reporting on a quarterly basis.

Implementing Agency Performance Rating
Satisfactory

Overall Borrower Performance Rating
Satisfactory

10. M&E Design, Implementation, & Utilization

a. M&E Design

The PAD noted that at appraisal there was considerable concern in the research community regarding monitoring and evaluation of research results. These matters were carefully addressed at appraisal leading to a comprehensive M&E system for the project but in the event the system had some shortcomings. The PAD stated that "Each Regional Center of Excellence will have the primary responsibility for the project's M&E in activities for which it leads." However, as noted already, the results framework provided a weak foundation for the M&E program because it contained only indicators but no results chains. Also, no management information systems were established in the participating countries. In July 2011 (two years after project approval) a Performance Monitoring Plan was prepared which "laid out a monitoring and evaluation system that ASARECA and the RCoEs will implement to determine the project's success" (page 5). The PDO



indicators were revised at the project's mid-term review.

Nevertheless, the ICR concluded, "the revisions resulted in the addition of highly complex PDO indicators that attempted to track too many disparate outputs and were therefore difficult to interpret" (paragraph 74). In addition, as noted already in Section 4 of this Review, many indicators sought the achievement of rates of change whereas in practice the measures used were all percentage changes. The complexity and incorrect specification of indicators can be traced to the inadequately prepared results framework in the PAD.

b. M&E Implementation

Collection of information was done by the research institutions (managed by the Regional Centers of Excellence) in the participating countries using the Performance Monitoring Plan as the basis for the definition of the indicators, plans for data collection, responsibilities for data collection and the data presentation methods. The participating countries were diligent in the collection of data, but e collections lacked focus.

c. M&E Utilization

The ICR stated that the M&E framework, along with detailed quarterly M&E reporting in each country, guided decisions regarding reallocation of funds. The M&E is to be distinguished from the more complex PDO indicators, which were not relied upon for project management. The M&E clearly indicated that more funding was needed to scale up certain activities, among other things, in providing seeds, cultivars and dairying technologies to farmers in individual countries. The M&E also contributed to the measurement of compliance with Phase 2 triggers and helped build a case for Phase 2 which stimulated the EAAPP countries to request the second phase.

An impact evaluation for EAAPP was prepared as a planned part of the M&E system. This exercise was managed by ASARECA and resulted in the "End of Phase I Evaluation". Many of the conclusions from that report were used in the ICR.

M&E Quality Rating
Modest

11. Other Issues

a. Safeguards

EAAPP was an environmental Category B project. The project triggered safeguard policies in the areas of environmental assessment and pest management. The PAD added that Environmental and Social Frameworks were prepared for each participating country and for ASARECA, each of which incorporated a pest management plan. The Plans were disclosed in each country, by ASARECA and disclosed at the *Infoshop* (paragraph 102). According to the ICR, the construction of Regional Centers of Excellence, other renovations, and the use and disposal of chemicals complied with the requirements of the national environmental authorities/systems. The ICR also stated that an environmental safeguards specialist regularly participated in Bank supervision missions (paragraph 35). The ICR also noted that safeguards policy on involuntary resettlement was also triggered during implementation, and it reported that there were no unresolved issues (paragraph 35). This Review therefore concluded that during implementation this project complied with all safeguard policies triggered by the project.

b. Fiduciary Compliance

According to the ICR fiduciary activities were implemented smoothly with no unresolved issues (paragraph 35). The only reference to audits of the project in the ICR was in the summary of the Uganda Government's own ICR for the project which mentioned that "Audits conducted by government were unqualified" (paragraph 1.5). The Uganda Government's ICR also stated that "Procurement was speeded-up in the last two years but would have been better done if the project produced a strategic procurement plan up-front" (paragraph 1.5). The only general problem mentioned in the Bank's ICR was one "unsatisfactory" rating for financial management in the Implementation Supervision Report that



preceded the MTR because of a lag in disbursements.

With respect to procurement, the ICR stated that "except for some contract management issues, due to capacity limitations at the RCoEs and the consultancy firms supervising the contractors, that delayed the timely completion of the civil works in all of the program countries, there were (also) no unresolved issues and all ratings were moderately satisfactory or satisfactory. A complaint was made by a bidder after an award for seed cleaning machines regarding restrictive qualification criteria, but the Bank had given a no objection to the procurement because the bidder waited until contract award to register the complaint (paragraph 36).

c. Unintended impacts (Positive or Negative)

Nil

d. Other

Nil

12. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Satisfactory	Moderately Satisfactory	The difference between the ratings was caused by a "modest" rating for efficiency by this Review compared with a "substantial rating by the ICR.
Risk to Development Outcome	High	High	---
Bank Performance	Satisfactory	Moderately Satisfactory	The difference between the ratings was due to a rating of "moderately satisfactory" for quality at entry and "satisfactory" rating for supervision which, according to the harmonized guidelines, translates into a "moderately satisfactory" rating for overall Bank performance..
Borrower Performance	Satisfactory	Satisfactory	---
Quality of ICR		Substantial	---

Note

When insufficient information is provided by the Bank for IEG to arrive at a clear rating, IEG will downgrade the relevant ratings as warranted beginning July 1, 2006.

The "Reason for Disagreement/Comments" column could cross-reference other sections of the ICR Review, as appropriate.

13. Lessons

The ICR drew eleven lessons from the project. Those that had broader implications beyond EAAPP were as follows:

- **Project Design.** Agricultural research activities can have an enhanced impact when linked to extension, seed multiplication and agriculture input supplies are integrated into the overall project design. For example EAAPP included downstream activities with a high level participation of farmers that make agricultural research more relevant.



- **Allocation of Regional Responsibilities in Regional Programs.** In planning regional projects, substantial time should be allowed to have all parties agree on how to collaboratively determine their respective roles. For example, Kenya had its own wheat research program, but agreed to cede research leadership in wheat to another country..
- **Project Oversight.** Establishing a steering committee at a high level for a regional project can provide a necessary boost to projects requiring cross border cooperation. For example the Permanent Secretary level steering committee for EAAPP introduced at the mid-term review accelerated technology sharing and promoted discussions of modalities for better cooperation in technology sharing, while also promoting the broader perspective of the whole agricultural value chain.
- **Spillover Effects.** Implementers of regional agricultural programs should look for ways to capitalize on spillover effects. For example, new agricultural technologies reached countries outside of participating countries. These countries also contributed new technology, innovations and management practices that were not necessarily their comparative advantage.
- **Research Institutions as Public Goods.** Regional Centers of Excellence offer a special advantage to agricultural research and development in that they are regional public goods that are made available to the scientists and development professions of multiple nations. For example, Regional Centers of Excellence contribute to the strengthening regional collaboration and remain an asset shared by the participating countries and other countries. However, questions remained regarding the sustainability of the centers in terms of their budgeting and staffing and hence the lesson is that these issues need to be addressed.

This Review suggests another lesson, namely:

- **Integrity of Bank Commitments.** Requirements by the World Bank that country clients meet triggers to qualify for second phases of a project should be accompanied by a Bank commitment to contribute to financing a second phase if the triggers are met.

14. Assessment Recommended?

Yes

Please explain

At least three issues should be pursued in any subsequent assessment of this potentially very important regional project. They are (a) the quality of the significant increase in research staff resulting from the project's capacity building and training programs; (b) the quality of the technological advances emerging from the research financed by the project such as the 472 TIMPs that, according to the ICR, were generated by the project of which only 76 were disseminated before the project closed; and (c) how well have the project's core principles of centers of excellence and collaboration in research among participating countries been sustained.

15. Comments on Quality of ICR

The ICR was candid regarding the challenges faced by the project and its performance. It was internally consistent and drafted according to OPCS guidelines. It provided a considerable amount of evidence on the project's achievements which was drawn to a large extent from the independent "End of Phase 1 Evaluation". Many lessons were drawn but they were not all of general relevance. One area in which the ICR could have provided more analysis was the project's efficiency. Rather than repeating the cursory and largely irrelevant analysis of efficiency in the End of Phase 1 Evaluation there was scope for a more comprehensive analysis of the project's efficiency in terms of the project's core institutional capacity building objectives.



- a. Quality of ICR Rating
Substantial