IMPLEMENTATION COMPLETION AND RESULTS REPORT  
(TF-93070)  
ON A  
GRANT  
IN THE AMOUNT OF US$55.3 MILLION  
AND AN  
ADDITIONAL FINANCING IN THE AMOUNT OF US$5.6 MILLION  
TO THE  
ASSOCIATION FOR STRENGTHENING AGRICULTURAL RESEARCH IN  
EASTERN AND CENTRAL AFRICA  
FOR  
THE ASARECA MULTI DONOR TRUST FUND  

June 30, 2014
CURRENCY EQUIVALENTS

(Exchange Rate Effective June 23, 2014)

Currency Unit = US$
US$1.00 = 2593 UGX

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AF Additional Financing
AGROBIO Agro-Biodiversity & Biotechnology Program
ASARECA Association for Strengthening Agricultural Research in Eastern and Central Africa
CAADP Comprehensive Africa Agriculture Development Programme
CGS Competitive Grants System
CIDA Canadian International Development Agency
DA Designated Account
DFID UK’s Department for International Development
DP Development Partners
EC European Commission
ECA Eastern and Central African
ESMF Environmental and Social Management Framework
FAAP Framework for African Agricultural Productivity
FARA Forum for Agricultural Research in Africa
FM Financial Management
HVNSC High Value Non Staple Crops
IAR4D Integrated Agricultural Research for Development
ICU/IT Information and Communication Technology Unit/Information Technology
IFR un-audited Interim Financial Report
ISR Implementation Status and Results Report
KMUS Knowledge Management Unit and Up-scaling
KPI Key Performance Indicator
LFP Livestock & Fisheries Program
M&E Monitoring and Evaluation
MDGs Millennium Development Goals
MDTF Multi Donor Trust Fund
NARI National Agricultural Research Institutions
NARS National Agricultural Research Systems
NEPAD New Partnerships for African Development
NGO Non-Governmental Organization
NRM Natural Resources Management
OM Operational Manual
OP Operational Plan
ORAF Operational Risk Assessment Framework
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>PAAP</td>
<td>Policy Analysis and Advocacy Programme</td>
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<td>PCD</td>
<td>Partnerships and Capacity Development</td>
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<td>PDO</td>
<td>Project Development Objective</td>
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<tr>
<td>RF</td>
<td>Results Framework</td>
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<tr>
<td>SCP</td>
<td>Staple Crops Program</td>
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<tr>
<td>SG</td>
<td>Sub-Grantee</td>
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<tr>
<td>SIL</td>
<td>Specific Investment Loan</td>
</tr>
<tr>
<td>TIMP</td>
<td>Technologies, Innovations and Management Practices</td>
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<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
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<table>
<thead>
<tr>
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<tr>
<td>Vice President:</td>
<td>Makhtar Diop</td>
</tr>
<tr>
<td>Country Director:</td>
<td>Colin Bruce</td>
</tr>
<tr>
<td>Sector Manager/Sector Director:</td>
<td>Tijan Sallah/Jamal Saghir</td>
</tr>
<tr>
<td>Project Team Leader:</td>
<td>Assaye Legesse</td>
</tr>
<tr>
<td>ICR Team Leader:</td>
<td>Assaye Legesse</td>
</tr>
<tr>
<td>ICR Author:</td>
<td>Malathi Jayawickrama</td>
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A. Basic Information

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<tr>
<th>Country:</th>
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Environmental Category: B
Implementing Agencies:
Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA)

Cofinanciers and Other External Partners:

B. Key Dates

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<th>Process</th>
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C. Ratings Summary

C.1 Performance Rating by ICR

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<th>Outcomes:</th>
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<td>Bank Performance:</td>
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<td>Grantee Performance:</td>
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C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)

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<td>Overall Bank Performance:</td>
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## THE ASARECA MULTI DONOR TRUST FUND (MDTF)

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1. Project Context, Development Objectives and Design

1.1. Context at Appraisal

1. **The countries in Eastern and Central Africa had some of the highest poverty and hunger rates in the world.** About 40 percent of the 200 million population in Kenya, Ethiopia, Uganda, Rwanda and Tanzania were classified as poor and chronically food insecure in 2008. In six of the ten member countries of the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA)--Burundi, the Democratic Republic of Congo (DRC), Eritrea, Kenya, Madagascar and Rwanda--the share of the population living on less than one dollar a day had increased since 1990, despite generally positive national economic growth rates. Most of the poor lived in rural areas and depended on agriculture—a core economic sector that contributed over 30 percent of GDP (Gross Domestic Product) and employed above 60 percent of the population in Eastern Africa. These peoples’ incomes were limited by low productivity and poor market access.

2. **Many trials had demonstrated that better technologies such as improved seeds and soil management, and healthcare for livestock could double yields or do even better.** As agro-ecological zones crossed national borders, however, adapted technologies and best practices needed to be made available for adoption in appropriate zones throughout the region. A regional platform was viewed as having the ability to achieve economies of scale by identifying multiple partners at national level, and moving technologies and knowledge to potential users more efficiently than could be done on a country-by-country basis.

3. **ASARECA had been established in 1994 as a sub-regional non-profit organization of the National Agricultural Research Institutes (NARIs) in ten countries of Eastern and Central Africa, to catalyze and promote cross-border collaboration in agricultural research that leads to effective and efficient impact across the region.** ASARECA’s role was to support the system of integrated agricultural research for development (IAR4D), and deliver improved scientific knowledge, policy options and technologies as instruments to drive the sub-region towards meeting the Comprehensive Africa Agriculture Development Programme (CAADP) agenda, which had set a goal of 6 percent annual growth for the sector. CAADP Pillar IV in particular emphasized increasing agricultural productivity.

4. **ASARECA’s activities had expanded greatly over the years, necessitating institutional and organizational reforms.** In 2006, its programs that had been coordinated largely in a decentralized manner were consolidated at the Secretariat in Entebbe. ASARECA had developed a 10-year Strategic Plan to support prioritized areas of research. It also had a five-year Operational Plan (OP-I) 2008-2013, which detailed the implementation of the strategy, and set forth new structures, systems and directions necessary to achieve its mandated activities.

5. **A Multi-Donor Trust Fund (MDTF) offered a harmonized approach to investments in IAR4D in the sub-region;** an approach that was seen as essential to effectively and efficiently

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1 The ten countries were Burundi, DRC, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, Sudan, Tanzania and Uganda. South Sudan has since joined, making this eleven.
assist institutional reforms in ASARECA. The European Commission (EC) had been supporting ASARECA activities over several years, but due to administrative issues, in mid-2007, sought an alternative modality of support. The World Bank had gained valuable experience over many decades of support to agricultural research and extension world-wide, had several interventions in the majority of the ASARECA member states, and had provided leadership in donor coordination to strengthen African capacity in agricultural innovation. The 2008 World Development Report (WDR)\(^2\) that focused on Agriculture for Development and the Global Food Crisis of 2007/8\(^3\) also provided additional and strong justification for regional collaborative efforts to boost AR4D initiatives to address the food insecurity and rural poverty challenges.

6. Based on consultations with key donors, the recipient-executed MDTF was established, with the Bank as the administrator of the funds. The original estimated amount of the five-year MDTF was US$55.3 million to support ASARECA’s OP-I. The MDTF became effective on November 4, 2008.

1.2. Original Project Development Objectives (PDO) and Key Indicators

7. The project development objective was “to support a program of integrated agricultural research for development (IAR4D) as described in ASARECA's Operational Plan, to contribute to more effective use of resources devoted to agricultural research among the member countries and wider access to the results of research in the regional agricultural systems of Eastern and Central Africa”.

8. The Key Performance Indicators (KPIs) were: (i) percentage increase in adoption of technology innovations for agricultural production and processing (across the sub-region); (ii) number of best practices and methodologies implemented in knowledge management, advisory services, and integrated natural resource management practices; and (iii) number of advocated policy options implemented by stakeholders.

1.3. Revised PDO and Key Indicators, and reasons/justification

9. The team initiated a slight adjustment of the MDTF PDO and KPI at the MTR in September 2011, to include ‘dissemination’ of information on agriculture technologies and innovations, in line with a revision of the ASARECA OP-I Results Framework (RF). Subsequently, USAID (who joined the MDTF in 2012) and the EC pledged funds to the MDTF that exceeded the original estimated amount. The additional funds were mainly to support the

\(^2\) The WDR emphasized that agriculture continues to be a fundamental instrument for sustainable development and poverty reduction. It also highlighted the importance of multi-sectoral approach to capture the synergies between technologies, and the need to coordinate across countries to provide an expanded market and achieve economies of scale in AR4D initiatives.

\(^3\) The FAO report on the 2008 Food Crisis indicted the urgent need to respond and address the crisis that pushed an additional 115 million people into hunger, and confirmed that agri led growth appears to be a major element in the fight against poverty. Thus, boosting small farmers’ food production, enhancing agri productivity, improving nutrition and environmental considerations deserve priority considerations.
validation and scaling up of select agricultural technologies and best practices generated under the original project. Accordingly, the MDTF was restructured on October 4, 2012 to include additional financing (AF) of US$5.6 million and new targets to reflect the added results expected to be achieved with the increased funds. The restructuring also included realigning the PDO and the Results Framework (RF) to strengthen the links between the output and purpose level indicators and facilitate effective measurement of the KPIs (AF Project Paper, 2012).

10. **The Revised PDO:** To enhance access and utilization of agricultural research technologies and innovations in the regional agricultural systems of Eastern and Central Africa. This was to be achieved through supporting ASARECA’s implementation of identified areas of priorities in research development as described in its OP-I.

11. **The Revised KPIs:** (i) number of stakeholders accessing the technologies, innovations and management practices (TIMPs); (ii) percentage of stakeholders adopting new TIMPs in selected development domains; (iii) number of reform of policies, laws, regulations and procedures approved; (iv) level of stakeholder satisfaction with TIMPs; and (v) number of direct beneficiaries reached through ASARECA support (disaggregated by gender).

1.4. **Main Beneficiaries**

12. Ultimate benefits were expected to accrue to farmer households reached through ASARECA support and to non-beneficiary farmers through spillover effects. The immediate beneficiaries were in the ASARECA member countries and included the ASARECA Secretariat and a broad range of partners required to deliver ASARECA’s wide-ranging program of agricultural research, extension, and training services, i.e. universities, NARIs, NGOs, and the public and private sectors that impact publicly-supported agriculture productivity programs.

1.5. **Original Components**

13. **Component 1: Research for Development (US$43.46 million).** This component covered: (i) agricultural research and dissemination, to fund the generation of priority research sub-projects, mainly through a rigorous Competitive Grants System (CGS) or commissioned directly; (ii) agricultural policy analysis and dissemination, aimed to support policy research related to productivity, markets, public policy, and strategy for the sector. ASARECA was to disseminate the research findings and advocate to reform and improve policy decisions in the sub-region; and (iii) agricultural extension enhancement, to fund work with partners in the national programs to facilitate technology adoption and knowledge, including developing tools for the up-take of technologies to benefit agricultural extension and farmer empowerment.

14. **Component 2: Support to ASARECA's Governance Structures (US$1.51 million).** This component sought to strengthen the overall governance and oversight structures to enhance ASARECA’s ability to fulfil its mandate. Activities funded included technical assistance and advisory services with respect to internal operational procedures, financial management (FM) and procurement and information and communication capabilities.
15. **Component 3: Support to ASARECA's Management & Administration Structures (US$8.66 million).** This component aimed to strengthen the administration and research support of ASARECA and to improve the physical infrastructure of the headquarters.

16. **Component 4: Management, Administration & Supervision of the TF (US$1.7 million)** was to finance the costs incurred by the Bank in managing and supervising the MDTF.

1.6. **Revised Components.** Not Applicable.

1.7. **Other significant changes**

17. Project scope was scaled up to include 13 new sub-projects under the AF. The AF also financed to a lesser extent: (a) associated ASARECA monitoring and evaluation (M&E) activities, including capacity strengthening for the selected sub-project executing agencies; (b) ASARECA operational costs; and (c) a portion of Bank costs for continued grant oversight and administration. Allocations to Components 1 to 4 were increased respectively by (US$ million): 5.09; 0.05; 0.42; and 0.04. The beneficiaries remained small-scale farmers, with increased efforts to reach women and youth.

2. **Key Factors Affecting Implementation and Outcomes**

2.1. **Project Preparation, Design and Quality at Entry**

18. The MDTF was an appropriate tool to assist ASARECA to expand its activities in the sub-region, and add value to the work of the member-country NARS. The MDTF was prepared in a participatory manner in consultation with donors and ASARECA, and was open to multiple donor contributions; thus offering a coordinated approach to investments in IAR4D in the sub-region. It also facilitated the harmonization of procedures and formats to be applied by ASARECA, using its own procedures to meet the requirements of all the donors. ASARECA demonstrated keen ownership of the project and in strengthening its own capacity.

19. The MDTF incorporated lessons from Bank programs such as the regional West Africa Agricultural Productivity Project and similar competitive grant systems in several Pillar IV MDTFs, and from ASARECA’s past performance. These were: research needed not only for generating but also to focus on validation, scaling out and adoption of technologies. Research grants awards must be based on explicit economic, eco-regional, social, and technical criteria, and programs and sub-projects must be regularly reviewed, and regional projects were to address national interests and priorities to ensure ownership and coordination mechanisms.

20. The MDTF identified several risks and mitigation measures. ASARECA had established systems in FM, Procurement Guidelines and accounting policies with USAID support since 2002. Where these were inadequate for MDTF implementation, i.e. in in-house procurement capacity and the internal audit system, the MDTF required actions to mitigate risks.
2.2. Implementation

21. The ASARECA Secretariat demonstrated strong commitment to the project, which helped to overcome the many day-to-day challenges reported in regular Supervision Mission Aide Memoires. Overall, the MDTF was well implemented. Key factors that affected implementation and outputs/outcomes are as follows:

22. **The suspension of the European Development Fund (EDF) on June 30, 2007 (due to administrative issues) affected 22 CGS research sub-projects that had been approved for funding under the EC Grant, and had to be abruptly halted.** Contracts were suspended for eight sub-projects that had commenced research activities. The remaining 14 were at different stages of contracting. Eight had been signed, allocated funds but research work had not started. The remaining six had been evaluated, approved for funding but not signed. For financing purposes, detailed costing was required of all remaining activities of the suspended sub-projects. SG Agreements had to be amended and new contracts entered for financing under the MDTF. Some CGS sub-projects faced delays of over two years in the transition. Although these were revived under the MDTF, implementation suffered. The suspension also affected planning and budgeting at research institutions, and staffing of sub-project teams. In Uganda, the National Agricultural Research Organization (NARO) halted contracted CG research due to the unexpected shortfall in funds. Timely communication might have helped NARO to make alternative plans to its program. Sub-project teams had to be re-assembled and most sub-projects had to be extended in an effort to complete activities. For example, one project involving five countries, on Exploiting Market Opportunities for Value Added Dairy and Meat sub-projects, which had been allocated US$103,000, experienced a 1.5-year freeze. It was retrofitted under the MDTF but closed in 2011, having used only two-thirds of the funds and achieved 60 percent of its planned outputs.

23. **Low utilization of ASARECA’s annual budget with respect to sub-grantees (SGs) (due to initial fiduciary capacity constraints, which got remedied over time)** In terms of actual expenditures, ASARECA used only 48 percent of the budget in 2009, and carried over US$11 million into the 2010 budget. This pattern continued in early 2010 (Joint Mission Report, May, 2010, p. 21). The low burn rate was a result of non-compliant FM practices and delays in fund disbursement to SG spending centers, procurement of goods and services by SGs, and submission of SG financial reports to ASARECA to initiate replenishment.

24. ASARECA and donors agreed on action plans to resolve this issue (Joint Mission Report, 2010, p. 25). ASARECA proactively executed the plan and, by end-October that year, accountability of advances made to SGs increased to 67 percent. Steps taken included: the Secretariat hiring two FM staff to strengthen its fiduciary capacity; ASARECA increasing support to and monitoring of SG FM and safeguards in line with the Operational Manual (OM); and capacity building for SGs, including in procurement conducted in Uganda, Kenya, Sudan, Ethiopia and Rwanda. As SGs had identified high prices for imported goods as an issue, the Secretariat organized centralized procurement for some items on their behalf. The Bank’s procurement staff also trained ASARECA Program Managers to assist ASARECA and SGs to ensure compliance with its own procurement procedures. These steps helped to improve quality and timely submission of SG reports. Some weaknesses remained, however; and the Secretariat agreed to closely follow-up on accountability reporting from SGs. By end-December 2013, the
burn rate stood at 91 percent. With the extension of the MDTF, the balance is expected to be spent before end-2014.

25. **ASARECA program implementation was rooted in the CAADP and Framework for African Agricultural Productivity (FAAP) principles, helping to align the resulting projects to country needs.** The principles of FAAP include: *pluralism in the delivery* of agricultural research and training; and the *empowerment of end users* to ensure their meaningful participation in setting priorities and work programs to ensure their relevance (FARA, June 2006). This provided an incentive to member-country NARS to respond to ASARECA and actively participate in its programs from inception. Further, projects were implemented in partnership with the different NARS, had in-built performance monitoring plans, and implementers reviewed progress and develop better strategies to realize outcomes. The broader focus on NARS, and cross-country execution ensured that outputs were realized due to rich experiences and expertise.

26. **Collaboration with partners helped to supplement MDTF activities to achieve results.** ASARECA partnered with other projects to build research capacity of the ‘less-participating’ NARS (Burundi, Madagascar, Rwanda, South Sudan, Sudan, DRC and Eritrea). These projects included Strengthening Capacity for Agricultural Research and Development in Africa (SCARDA) funded by DFID, and Dissemination of New Technologies in Africa (DONATA) funded by AfDB, and Biosciences for Eastern and Central Africa (BeCa-ILRI) - a New Partnerships for African Development (NEPAD) Center for Excellence. In 2011, when SCARDA was ending, ASARECA allocated extra MDTF funds to continue this critical work. The alliance with various CGIAR centers and other pan-African bodies such as Common Market for Eastern and Southern Africa (COMESA), African Union Commission (AUC) and FARA provided platforms for influencing policy and technology uptake. These activities fitted with OP-I priorities and helped to achieve MDTF outcomes.

27. **The Mid-Term Review (MTR) in September 2011 was a significant exercise,** and included an Evaluation of USAID Support to ASARECA; and an independent external MTR of the OP. The MTR identified environmental safeguards concerns, and ASARECA adopted the proposals to ensure compliance (Section 2.4). The MTR confirmed encouraging progress towards the MDTF objectives by ASARECA and the SGs despite decentralized and demanding implementation challenges. The Results Framework (RF) was modified at the MTR, and in 2012 to incorporate activities under the Additional Financing.

28. **Some countries’ internal systems with respect to the flow of funds slowed implementation:** for example, when funds was channeled through Head Offices and not given directly to implementers. This remains an issue in Ethiopia, DRC, Kenya and Sudan, where, PIs have to repeatedly follow up, causing delays in obtaining funds and in procurement.

2.3. **Monitoring and Evaluation (M&E) Design, Implementation and Utilization**

29. ASARECA was responsible for M&E, using its’ own RF and M&E implementation plan that set out performance indicators for OP-I. The MDTF RF was well designed and echoed the OP-I priorities. The KPIs clearly reflected the PDO, and component activities, expected outputs, and the KPIs were strongly linked. This made it easier to monitor MDTF outputs and outcomes.
30. ASARECA used M&E at different levels (project, program and ASARECA) for different purposes, and provided regular monitoring of implementation. By using its management information and FM systems, activities were kept on track and potential problems addressed. The system also provided a useful management tool, for example, to track CGS disbursements and to design relevant training materials. A delay of about eight months from July 2009 in filling the position in the M&E Unit slowed some activities; however these are now well underway. The M&E unit trained over 326 people; including ASARECA Program staff and Project Partners in impact assessment, data quality management, results-based M&E etc. Similarly, relevant and user-friendly M&E operational procedures and tools were introduced to accelerate M&E and learning. These have facilitated timely decision making at all levels.

31. The M&E system improved substantially over OP-I, with good monitoring of outputs in technology and innovation, generation, adoption and up-scaling, although the latter was limited. Overall, ASARECA has successfully set up a functioning M&E system and created a culture of monitoring its activities, projects and programs, and those run by its partners, which is commendable. The system is online for use by national M&E teams. OP-II has started with a robust M&E system in place due to the work done at all levels—the Secretariat, NARS, SG and other IAR4D partners. The Impact Evaluation (IE) 2014 should serve as a baseline for monitoring activities and outcomes under OP-II.

2.4. Safeguard and Fiduciary Compliance

32. The MDTF was classified an Environmental Category B due to its’ relatively limited environmental impact potential. Three policies were triggered: (i) environmental assessment (OP/BP 4.01); (ii) Forests (OP/BP 4.36); and (iii) Pest Management (OP 4.09). ASARECA prepared an Environmental and Social Management Framework (ESMF) to be included in OP-I. The CGS sub-projects’ environmental risks and management plans were identified in sub-project funding proposals, evaluated as criteria for funding, and monitored by ASARECA’s M&E unit.

33. The MTR observed that ASARECA had not been applying the provisions of the ESMF to all its activities, and downgraded overall Safeguard Compliance to ‘MU’ (ISR, November 2011). These provisions were also not being adequately followed in the newly-approved sub-projects. Although most of the new sub-projects had been screened for environmental and social impacts, proper categorization was not being done to identify the level of assessment required. Some sub-projects that required the preparation of Integrated Pest Management Plans (IPMPs) and ESMPs had not prepared them. The Bank recommended recruitment of an Environmental and Social Screening (ESS) Specialist to review and assist in the development of ESS instruments. ASARECA adopted the MTR’s proposals and incorporated them into the new sub-projects that began in late 2012/early 2013. Capacity building efforts improved the level of compliance. By June 2013, safeguards compliance was rated MS and in December 2013 it was upgraded to S.

34. Financial Management, FM issues were mostly related to the low burn rate discussed in Section 2.2, and resolved accordingly. The capacity of the Secretariat’s existing FM team is strong, due to the recent recruitment of an additional accountant to enhance FM oversight of SGs and an additional internal auditor, and the formation of a stand-alone audit committee. The
Secretariat team has adopted a proactive approach of training the SGs on FM and procurement before disbursement. FM arrangements have been mainstreamed at the SG level. The MDTF is in full compliance with the financial reporting requirements, including the timely submission of acceptable quarterly interim financial reports and annual audit reports. All the audit reports have been unqualified and no major FM weaknesses are reported. The review at the SG level noted that there were general improvements in the FM systems in most of the institutions.

35. **Procurement.** The post procurement review in 2010 of a sample of MDTF-financed procurement undertaken by the Secretariat highlighted a number of issues including incomplete procurement files, non-compliance with guidelines for some procurement, and conflict of interest with respect to the Procurement Officer’s duties. Procurement was downgraded to ‘MS’. ASARECA management executed the necessary remedial actions, such as fulfilling the requirement for new sub-project proposals to undergo a procurement assessment, hiring a Procurement Officer in July 2011, and submitting procurement plans by all new SGs and most existing partners.

36. The main remaining activity is the procurement of the construction of the Headquarters. The size of the building has been scaled down, and the estimated cost has been reduced from US$2.3 million to US$0.997 million. The Bank has approved the revised structural design and the National Competitive Bidding method. The contractor is expected on board by July 1, 2014, and the will proceed during OP-2. The Post-Procurement Review (PPR) noted that procurement capacity within the Secretariat remained adequate with general compliance with the procurement manual; however, the SGs require more support and monitoring to conduct timely procurement.

### 2.5. Post-completion Operation/Next Phase

37. The MDTF was designed to close after five years, and was to be followed by another MDTF with new DP contributions. However, given the processes for setting up new MDTFs, it became apparent that this approach would not allow for the realities of research and development field activities, which cannot be readily started and completed on fixed dates without compromising the results achieved. Consequently, the Bank and DPs agreed to extend the MDTF for five years (2014-2018) to allow for the: (a) completion of OP-I activities; (b) utilization of unspent funds; and (c) addition of new funds to support implementation of OP-II.

38. OP-II has been developed through consultations with all stakeholders, and has three thematic areas: Natural Resource Management and Ecosystem Services; Markets, Market Linkages and Trade; and Sustainable Agriculture, Food Security and Nutrition. These have priority investment areas with associated project topics, expected results, and costs. The themes build on the collaboration during OP-I, and emphasize greater interaction between the program-based disciplines, and between the countries. The MDTF and OP-II, however, have so far not attracted much funds as many developed countries attempt to reduce debt. In response to the dearth of support, ASARECA has developed a Resource Mobilization Strategy and an Action Plan, and in line with those, has developed 25 funding proposals (in response to competitive calls) that have been submitted to a range of funding agencies.
3. Assessment of Outcomes

3.1. Relevance of Objectives, Design and Implementation

39. The MDTF’s PDO remains relevant to ASARECA’s strategy, which is aligned with CAADP Pillar IV and the NEPAD strategy for revitalizing agricultural research, technology dissemination and adoption. The objectives are relevant to the member states’ pursuit of raising agricultural productivity through accelerated innovation, and eradicating hunger. The World Development Report 2008 argues that significant growth in agriculture is critical for most African countries to meet the MDGs. The objectives are also relevant to the World Bank Strategy for Africa, 2011, a 10-year vision that embraces greater competitiveness in agriculture.

40. The multi-faceted approach, which called for interventions in research and dissemination, ASARECA’s governance structure, and reforms in agricultural policies based on research findings encompassed the essential elements needed to enhance ASARECA’s value added and its work with the member country NARS. The MDTF RF was well-designed, with a concise PDO, and clearly linked and measurable outcome indicators. The restructuring further improved these links by realigning them with the ASARECA OP-I indicators to allow for better monitoring.

41. The MDTF funding mechanism allowed multiple donors to work together to facilitate OP-I and to pool funds for continued IAR4D activities. It has also been an effective instrument for reducing the administrative burden on ASARECA, through the elimination of separate supervisions, financial and activity reporting for multiple donors. The Bank, as administrator of the funds, which also provides technical and administrative support, has set consistent and high standards throughout the duration of OP-I.

3.2. Achievement of Project Development Objectives

42. This section describes how MDTF-supported outputs helped to achieve the PDO. The IE assessed higher-level outcomes beyond those of the MDTF KPIs and PDO that signify enhanced stakeholder well-being, i.e. higher yields, income, and food security. These are also briefly mentioned below and detailed in Annex 5.4

43. The MDTF’s main objective was to enhance access and use of agricultural research TIMPs in the Eastern and Central African (ECA) region by supporting ASARECA to implement OP-I. Component 1 focused on research generation, dissemination and adoption activities, while Components 2 and 3 sought to strengthen ASARECA’s governance and management structures to help the Association to fulfil its mandate and assist targeted stakeholders to fully realize the project’s benefits.

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4 See Annex 2 for details on Outputs by Component, Intermediate Results Indicators, Specific Outcomes under Component 1, and a full list of definitions including Access, Innovation and TIMPs.
Table 1. MDTF Key Performance Indicators: Targets and Actual Achieved

<table>
<thead>
<tr>
<th>Project Key Performance Indicators (Outcome) Indicators</th>
<th>Baseline 2008</th>
<th>End of Project Target</th>
<th>End of Project Actual</th>
<th>End of Project (percent achieved)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Number of stakeholders accessing TIMPs</td>
<td>2,014</td>
<td>265,964</td>
<td>422,176</td>
<td>158.7</td>
</tr>
<tr>
<td>2. Stakeholders adopting new TIMPs in selected development domains (percent)</td>
<td>8.3</td>
<td>70</td>
<td>64</td>
<td>91.4</td>
</tr>
<tr>
<td>3: Number of reform of policies, laws, regulations and procedures approved</td>
<td>6</td>
<td>28</td>
<td>18</td>
<td>64.3</td>
</tr>
<tr>
<td>4: Level of stakeholder satisfaction with TIMPs. (percent)</td>
<td>5</td>
<td>81</td>
<td>71*</td>
<td>87.6</td>
</tr>
<tr>
<td>5: Number of direct beneficiaries reached through ASARECA support (disaggregated by gender)</td>
<td>12,084</td>
<td>1,595,784</td>
<td>2,533,056</td>
<td>(Male: 55 percent; Female: 45 percent)</td>
</tr>
</tbody>
</table>

ASARECA, M&E Unit, January 2014.
*Under Indicator 4, the achievement of 71 percent represents only those individuals who recorded either a high or very high level of satisfaction.

Achievement of Outputs and Outcomes:

- **KPI 1: Number of stakeholders accessing TIMPs**
- **KPI 2: Percentage of stakeholders adopting new TIMPs**

44. The MDTF funded 85 of the 90 successfully-concluded CGS sub-projects since 2009, and helped ASARECA to deliver a substantial research program. The sub-projects brought together researchers from 11 countries to generate work on 409 TIMPs of regional importance (against an OP-I target of 378). A breakdown of projects by program indicates that 310 sub-grantees received a total of US$30.2 million for research and uptake activities (Annex 2, Tables 1-2).

45. Generation of Research: Assuring relevance and quality. ASARECA followed a rigorous process to ensure relevance and quality of research through its seven research programs and the CGS. The programs were: Staple Crops; High-Value Non-Staple Crops; Livestock and Fisheries; Agro-Biodiversity and Biotechnology; Natural Resource Management (NRM) and Forestry; Policy Analysis and Advocacy; and Knowledge Management and Up-Scaling (KMUS). They were managed by well-qualified scientists, and designed to address only high priority topics and deliver results within a short time span.5

46. The CGS was ASARECA’s main instrument for addressing regional research priorities and improving the rigor and quality of research proposals. CGS proposals were based on the results of priority-setting workshops attended by stakeholders from all the countries including government agencies in research and dissemination, NGOs, private enterprises and farmers. This

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5 This was based on International Food Policy Research Institute (IFPRI) analysis, which had shown that “the largest impact for the greatest number of beneficiaries” would be attained through a primary focus on major food crops that were also traded regionally.
process was effective in ensuring congruence with regional priorities. Research designs, implementation, analyses, interpretation of results and write-up were all undertaken by the regional teams and overseen by ASARECA Program staff.

47. **Quality of Science (QoS):** Through capacity development and the regional collaborative research program, 293 partnerships were fostered among several agricultural research actors within the region (exceeding OP-I targets by 23 percent, as described in Annex 2). These partnerships have allowed for an exchange of knowledge and experiences across different institutions when dealing with similar challenges. Through these partnerships, research outputs increased marketing of commodities, institutional mentorship of scientists, adoption of selected TIMPs, etc. Partnerships were formed, predominantly among NARS actors across the region. For example, some of the competitive research grants stipulated that collaborative research projects should be carried out in at least 3 countries involving different actors, such as research institutes, universities, advisory services providers, private sector, farmer organizations and non-state actors. Bank missions noted that the use of multidisciplinary teams contributed significantly to overall improvement in the quality of research.

48. **Access to TIMPs:** In the ASARECA context, access refers to the ease that people have in obtaining relevant products and services such as TIMPs. Access to TIMPs includes how to get them, where to get them, how to use them, and what impact would be achieved after using them. In all, 422,176 stakeholders accessed an assortment of TIMPs. The numbers accessing new and existing TIMPS increased steadily over the years except for the reduction in 2012. This was due to the closure of some pre-OP-I projects inherited by the MDTF, which had limited awareness and up scaling activities. In 2013, there was a substantial increase in the numbers accessing TIMPs due to the scaling up/out activities under the additional financing.

49. **Adoption of TIMPs:** Similarly, the uptake of technologies has been good. Methods for scaling up the adoption of technologies were tested systematically, and a total of 498 demand-driven TIMPs (12 percent above OP-I target of 444) were made available for uptake and development. This also included technologies that were already available (“on the shelf”) where ASARECA supported the processes to make these technologies accessible. The rate of adoption of the already-generated TIMPs by stakeholders increased gradually from 20.6 percent in 2009 to 64 percent in 2013. Overall, based on the trends data, the average rate of adoption of available TIMPs over the five years was 42.2 percent compared to the OP-I target of 43.1 percent.

50. These new technologies included new crop varieties (including quality protein maize (QPM) and orange fleshed sweet potato, with significant nutritional value, cassava, sorghum, green gram, Napier grass, climbing beans, and banana), seed multiplication, new seed production technologies for vegetatively-propagated staples (i.e. banana), improved soil fertility and water management practices, improved pest and disease management practices (both crop and livestock), post-harvest management and value addition (i.e. dairy value chain, bee keeping), and

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6 However, due to capacity issues and access to information, the majority of the grants were awarded to a relative small group of actors in three countries within the region.

7 The number of stakeholders accessing TIMPs in each year: 7,120 (2009); 22,915 (2010); 68,632 (2011); 25,557 (2012); 297,952 (2013).
enhanced NRM practices (i.e. afforestation, forage management, integrated agro-diversity, and conservation management to promote eco-tourism).

51. Gender was well mainstreamed across the ASARECA program portfolio, with 96 percent of all research projects categorized as ‘gender-responsive;’ i.e. incorporating gender-responsive agricultural innovation systems activities in their interventions. Several NARIs have also set up gender units within their institutions. The IE shows clear benefits for women beneficiaries.

52. While the first three years of OP-1 focused mainly on generating new TIMPs, the emphasis in the last 2 years shifted to the out-scaling of these technologies and adoption by farmers. Building on its experiences of the second part of OP-1, ASARECA has started to engage more with private sector partners and non-state actors to work on scaling out technologies through strong linkages to market and value chain development. The IE findings from OP-1 demonstrate that a number of TIMPs provided clear benefits for farmers in terms of increased production and increased income, as presented below. For OP-2, ASARECA has developed a scaling-up strategy, with a strong emphasis on determining the increases in farm household incomes as well as the levels and rates of adoption of the TIMPs.

53. The innovation platforms for technology adoption (IPTA) under the Knowledge Management functions also promoted problem-solving by a wide range of stakeholders, including researchers, farmers, extension workers, NGOs, policymakers, equipment manufacturers, traders and processors. The fact that the end users of an innovation were involved every step of the way in the development of the technology appears to have made innovation adoption much easier (Aide Memoire, February 2014, Annex 11).

54. Other positive outcomes include the following:

- 4,658 hectares of land were dedicated to TIMPs, mainly for the production and multiplication of quality pre-basic, basic and certified seeds of selected commodities (i.e. Quality Protein Maize (QPM), African Indigenous Vegetables, snap & climbing beans…);
- Over 20 percent of this land was devoted to seed multiplication, especially for sorghum, cowpeas, green gram, QPM, Orange Fleshed Sweet Potato (OFSP), as well as on-station and on-farm establishments and rehabilitation of forage seeds;
- Production of 2,436 metric tons (MT) of quality pre-basic, basic and certified seeds from these dedicated lands, through seed multiplication and production processes;
- Seed sales of over 30 percent, with the rest distributed to farmers for further multiplication;
- Over 50,000 hectares of highly degraded lands (mainly with the arid and semi-arid lands) and watersheds reclaimed;
- Overall, the CGS projects are believed to have helped about 1.45 million smallholder farmers and other primary sector producers, including individual processors, rural entrepreneurs, managers and traders, and natural resource managers via access to TIMPs, access to inputs and markets, and demonstrations. This has led to more resilient crops, higher yields, and increased incomes.
- Through the sale of products and services produced from the projects, the targeted farmers and stakeholders generated a total income of US$12.5M.
55. The IE findings on higher-level outcomes include the following (detailed in Annex 5):

- **Beneficiaries achieved increases in yields of key crops of most projects surveyed**, especially QPM, Sorghum-Legume, Bean Innovation (Uganda) and Integrated Water Management (Kenya). However, there are large yield variations between farmers and many beneficiaries have not yet seen increased yields;
- **Cash incomes of beneficiaries increased notably for half of projects surveyed**. This is significant given the short time period since taking up the technologies. Averaged across all projects surveyed, incomes from sales of crops and livestock have increased by an average of US$388 per beneficiary between 2008 and 2012. Average incomes for non-beneficiaries fell by US$29;
- **Total value of net agricultural output (crops and livestock) increased in real terms** from 2008 to 2012 for beneficiary households surveyed from US$940 to US$1047: an average of US$106. By contrast non-beneficiary households saw an average fall of US$166;
- **Overall, there was an increase in the proportion of food secure beneficiary households over the program period** from 74 percent to 81 percent. However, food security status varies across countries and projects;
- **Household nutrition levels increased**. A snapshot of nutrition indicated that overall 56 percent of beneficiary households consumed from all food groups compared to 52 percent of non-beneficiary households, although the difference was not highly significant.

56. There were many other MDTF-supported activities and outputs that were critical in achieving research outcomes and the PDO. These included ASARECA’s advocacy to reform policies to help access to and adoption of TIMPs, capacity building of all stakeholders in the value chain, and the dissemination of research results.

- **KPI 3: Number of reform of policies, laws, regulations and procedures approved**

57. It is challenging to assess an organization’s contributions to policy change, especially when it involves regional harmonization, given the often long and arduous process in which a multitude of actors engage and interact. The progress made against each of the three intermediate indicators related to policy changes (policies analyzed, presented for decree, and approved) is described further in Annex 2. ASARECA played many roles in this process, as a key driver, and in a supportive role as a convening regional platform for agricultural research and providing specific technical expertise, i.e. in seed production, and policy analysis expertise (DFID, 2014).

58. ASARECA’s Policy Analysis and Advocacy Program (PAAP) contributed to catalyzing regional trade. Positive impact has been achieved (or is on its way) in such areas as seed law and the quality of processed agricultural products. For example, collaborative research and advocacy with ILRI and key decision makers in Kenya enabled small-scale farmers to penetrate extensive milk markets. Harmonized food standards for cassava supported the development of several value chains around cassava (see Annex 2 Table 3 for policy-related areas led by ASARECA).

59. A regional approach to addressing a set of significant policy constraints in collaboration with well-chosen partners, the majority from outside the NARIs, has been key to PAAP’s contributions to harmonizing national laws or regulations affecting seed trade, product quality
standards, and crop variety release. The USAID report (2011) particularly highlights PAAP as a positive example of what ASARECA can achieve through continuous and experienced program management, and through well-chosen partnerships with regional and international institutions as well as with individual scientists from beyond the NARIs. As a regional body, ASARECA is well placed to address some of the national barriers, but even more so the regional bottlenecks that limit the potential impact of proven agricultural research products.

60. So far, 100 different policies, laws, regulation and procedures have been analyzed through assessment by competent analysts, teams and consultants. An example of a policy analysis for which ASARECA’s role was appreciated was the policy research on trends in food price transmissions in Ethiopia, Kenya, Tanzania and Uganda. It showed the need for a clear roadmap to address the drivers of food price volatility instead of just responding to crises as they hit. As a follow up, a food price forecasting model was developed and is being piloted and customized to inform early warning and response systems in the region. The regional data portal can be accessed at https://sites.google.com/a/cgxchange.org/food-prices-portal/.

61. Policy work has succeeded in facilitating a change in existing polices. A total of 18 agricultural enabling environment policies, regulations, and administrative procedures in the areas of agricultural resource, food, market standards and regulations were approved. The relatively low number can be explained by the process of changing policies, which has to go through various stages. It is also difficult to attribute a policy change to a specific actor, i.e. ASARECA. An example of a policy option presented for legislation, which was adopted, is ASARECA’s contribution to the harmonization of 11 standards (cassava (7) and potatoes (4)) for the East African region, which was mainly driven by EAC. The standards were approved by the East African Standards Committee (EASC) and were subsequently declared by the East African Community (EAC) Council of Ministers to be used as East African Standards in 2009.

62. Harmonized standards are seen as important to enhance farm-level production, utilization and trade, local and intra-regional. The harmonization of cassava standards had a positive impact on farmers’ livelihoods through increased income derived from better marketing opportunities locally and regionally. For instance, it encouraged the Popular Kumi Women Initiative (Uganda) with its membership of 2,500 to grow cassava and sunflower, as processed sunflower oil and cassava flour have a ready market in Uganda’s urban centers. The sales from these products resulted in increased income for the women. They are now able to feed their children, themselves and husbands better, and now contribute to educating their children.

63. With regard to impacts of an improved seed policy environment, ASARECA’s support to enhancing the enabling policy environment for seed trade in the region has mainly been through the Eastern Africa Seed Committee (EASCOM). A policy impact study on the improved harmonization of regional seed policies led by ASARECA showed that by 2010, seed production within the region had tripled from 43,000 tons to about 122,000 tons. Domestic and cross-border seed trade has also increased threefold from 1,000 tons due to policy reforms, thus leading to growth in volumes of seed traded. For example in Uganda, the private sector has nearly taken over the role of seed production. Uganda with its 32 seed companies has fully liberalized seed
trade with the government retaining the role of regulation with options to cede some authority to accredited seed companies (DFID, 2014). Full liberalization of seed trade in East Africa has not been realized yet but work is on-going. It is notable, however, that for seed systems ASARECA has paved the way by working on key legislations and regulations for an effective seed system in several of the member countries (Seed law and associated regulations and institutional set-up, plant variety protection, seed certification, biosafety regulations at COMESA level, etc.).

64. It is clear from the new practices adopted that ASARECA contributed in a number of areas to facilitate policy making processes, mostly from a regional perspective. In this way, it has lived up to its regional orientation by working on issues of a regional nature and with a number of partners with a regional or international focus such as EAC, COMESA, East Africa Dairy Regulatory Authorities Council, East African Farmers Federation and CG Centers. However, policy uptake remains a challenge and a multi-pronged strategy needs to be developed to over the hurdles of the policy approval.

65. The MDTF, in collaboration with other projects and donors, supported capacity-building activities on a range of technical areas that enhanced overall knowledge and application methods of stakeholders, and contributed to significant positive impacts for farmers in terms of crop and livestock yields and income. The ASARECA Secretariat provided technical support to the SGs as needed. This varied with the level of experience of those involved in undertaking the specific activity. Generally, stakeholders met before, during, and at the end of the activities, and ASARECA staff and the national Principal Investigators (PIs) visited the activity sites during the sub-grant to provide technical and administrative backup. Bank missions and periodic external reviews that have critically assessed this work note the considerable expertise in national programs involving many effective PhDs. The cadre of researchers (PhD and Masters) from different countries who have been trained within and outside Africa contributed to the new knowledge and skills pool.

66. Overall, ASARECA facilitated capacity strengthening and skills development initiatives for 81,834 stakeholders (55 percent male; 45 percent female) through a series of targeted short- and long-term trainings and technical backstopping exercises. Target groups included M&E staff, Principal Investigators and other players in the value chain (farmers, traders, processors, NGOs, extension agencies, universities etc.). It should be noted, however, that the total trained includes both those capacity building initiatives provided by ASARECA directly, and those provided by other programs with facilitation support by ASARECA (such as SCARDA and BeCa-ILRI hub). ASARECA has tracked the whereabouts of beneficiaries of its higher education training initiatives and established that most have been deployed to critical positions in the agricultural sector in their respective countries. Former ASARECA-supported graduates are working at NARIs and play a key role in supporting the generation and uptake of new technologies (DFID, 2014). Annex 2 provides examples of the significant positive impacts of the targeted trainings for farmers in the areas of crop and dairy milk production, and moisture retention of farmlands.

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67. ASARECA created robust communication strategies for its different outputs to realize greater use of agricultural research and development innovations. ASARECA staff and sub-grantees made a consolidated contribution to this result, with the lead taken by the M&E team, the Knowledge Management Programme unit and the ICT unit. Different strategies of sharing research outputs were used, taking into account the different users and their needs. Some of the communication strategies were successful and others less successful. ASARECA took into consideration recommendations following the MTR to strengthen the KMUS and Information Communication Unit (ICU) to deliver the outputs. For instance KMUS has collated, compiled and established a database of 37 best-bet “proven” technologies and innovations that are ready for use in ECA countries – the products of past ASARECA programs, which are well tried and tested technologies that have potential for up-scaling to improve livelihoods (DFID, 2014). The KMUS took the lead in coordinating and supporting the development of 885 different types of information packages (intermediate indicator (IO) 1), while 272 different pathways have been used to reach the stakeholders (IO 2). The project reached over 2 million stakeholders with a variety of information products, mostly through demand. The level of satisfaction of stakeholders accessing disseminated information was 87 percent, against a target of 75 percent (IO 3).

68. Infrastructures provided mostly to NARIs were important in enabling researchers to conduct quality research by having access to appropriate and up-to-date research equipment. Examples include gene banks, computers, laboratory and building refurbishment, screen houses, nurseries, biodiversity monitoring kits, irrigation kids and forage choppers.

- **KPI 4: Level of stakeholder satisfaction with the TIMPs.**

69. After accessing and adopting the available TIMPs, 71 percent of the stakeholders were highly or very highly satisfied in 2013 compared to 11.5 percent in 2009. The average level of satisfaction over the five-year period is 40 percent compared to a target of 45.5 percent (due to the lower levels in 2009 and 2010). The slow increase in the stakeholders’ satisfaction with the TIMPs and other ASARECA products are mainly attributed to the short timeframe for project implementation, and the short duration for on-farm testing of the availed products.

70. The IE carried out a qualitative assessment of farmers’ evaluation of TIMPs. Households participating in ASARECA projects (beneficiaries) were asked about benefits realized from the technologies, whether technologies met their needs and to assess their level of satisfaction with the technologies (IE, p. 105-106, Table 38). The benefits that were reported included: increased income, production and food security; better nutrition; early plant maturity; reduced farmer labor requirements; increased soil fertility; and improved soil and water conservation.

71. Almost 80 percent of farmers surveyed reported that the technology benefits met their needs. Over 80 percent of OFSP project beneficiaries in Kenya and Tanzania, Bean Innovation project beneficiaries in Rwanda, Quality Seed Potato projects in Uganda and Rwanda, and QPM and Crop-Livestock beneficiaries in Uganda gave an overall positive assessment of technology benefits. A further 65-79 percent of beneficiaries from the Integrated Water Management project in Kenya and Rwanda; QPM, Sorghum-Legume Intercrop and Crop-Livestock Integration project in Tanzania; and Bean Innovation project in Uganda stated that the technologies met their needs. Only the Farmer Led Seed Enterprise project in Kenya had fewer than 50 percent of
beneficiaries reporting that the technology had not met their needs. These findings point to the overall good match between ASARECA-promoted technologies and beneficiary needs.

- **KPI 5: number of direct beneficiaries reached through ASARECA support (disaggregated by gender).**

72. The total number reached through support programs is about 2,533,056 (55 percent males; 45 percent females). This is based on the assumption that each farming household has six members, and that 422,176 stakeholders accessed various TIMPs.

73. Activities under Components 2 and 3 helped to strengthen ASARECA’s governance and management structures that in turn improved accountability and influence in national agricultural research systems. Support to ASARECA resulted in stronger individual, organizational and institutional capacity to plan and execute credible research linked to the needs of small holder farmers in the region. Key results include:

- Stronger and more accountable governance framework including a robust Constitution, Governance Manual (GM), Operational Manual (OM), host country agreement, effective board and management structures, credible research and FM systems, effective operational plan, operational M&E systems, compliance with environmental and social safeguards and more efficient procurement systems;
- Effective transformation from a loose network of researchers in 2006 to 7 integrated programs and technical support unit delivered under a single OP in 2013; and
- From a non-existent gender focus in ASARECA in 2006 to gender-mainstreamed programs coordinated by a well-resourced unit in 2013.

74. The various governance reforms broadened ownership of the organization and diverse partnerships beyond its traditional partners in research institutions in response to one of the major principles embedded in the FAAP, namely plurality in the delivery of agricultural research, extension, and training services. Broadened ownership also expanded ASARECA’s reach to fulfil its roles as one of the CAADP Pillar IV partner institutions. The roles cover sensitizing NARIs to the CAADP process, reviewing national and regional investment plans, and support to research based on ASARECA member country priorities (DFID, 2014).

75. Overall, the MDTF has helped ASARECA to improve the enabling agricultural policy and regulatory environment for increasing the productivity of smallholder agriculture in the region, and successfully achieved its PDO to enhance access and use of agricultural research technologies and innovations in the agricultural systems in Eastern and Central Africa.

### 3.2. Efficiency

76. The IE conducted an overall assessment of the performance of the OP-1 program based on the findings from the household survey, using a Cost-Benefit approach. This compared benefits accruing to program beneficiaries with costs of the program (US$90 million) (Annex 3). The analysis found that the net difference in incomes between beneficiaries and non-beneficiaries was US$272. Extrapolated across all ASARECA beneficiaries adopting new
TIMPs (270,000 households, i.e. 64 percent of stakeholder accessing new TIMPs), this represented a net increase in agricultural production value of US$73.44 million (change in beneficiaries compared to non-beneficiaries). Comparing the value of benefits to the program costs indicated that in about 1.25 years the program would have covered operational costs. Thus the benefit-cost ratio was expected to be positive by the second quarter of 2013.

3.3. Justification of Overall Outcome Rating

Rating: Satisfactory

77. The MDTF was relevant at the time of appraisal and continues to be relevant. Its components were also clearly linked and relevant to the PDO. As presented in Section 3.2, the PDO was achieved satisfactorily with the project exceeding several of the outcome targets, and in some cases by a significant margin. The IE found that the MDTF-supported activities also helped to attain higher-level outcomes such as increases in real value of total agricultural output, income for project beneficiaries, and food and nutrition security for most households, and participation of women and people with disabilities. In terms of efficiency, the analysis indicates that the benefit-cost ratio was expected to be positive by the second quarter of 2013.

3.4. Overarching Themes, Other Outcomes and Impacts

(a) Poverty Impacts, Gender Aspects, and Social Development:

78. The IE provides evidence of significantly increased average gross household incomes of project beneficiaries between 2008 and 2012 (Section 3.2). Averaged across all projects surveyed, incomes from sales of crops and livestock have increased by 90 percent for beneficiary households from US$429 in 2008 to US$817 in 2012. Gender aspects have been mainstreamed into research activities, and the project reached out to women and to households with disabilities (IE, p. 40). Of the CGS projects, 96 percent are categorized as ‘gender responsive’ (Section 3.2). Nutrition Security indicators showed improvements for beneficiaries and non-beneficiaries in Kenya, Rwanda, Tanzania and Uganda (IE, p. 36).

(b) Institutional Change/Strengthening

79. The MDTF has contributed to building long-term capacity in many areas. ASARECA has matured in terms of institutional capacity to identify research needs, design and commission credible research, and ensure research uptake and communication. As a state membership research body, ASARECA has the legitimate relationship with NARS and international agricultural research institutes to act as a regional platform for mobilizing resources and coordinating research at regional level for country and regional benefits. ASARECA has performed this role effectively by raising and managing resources for OP-1 and commissioning research under its seven programs. Training activities have also strengthened capacity in all players in the value chain, particular in the NARIs, and helped these partners to experience the benefits of well-coordinated research and development. Under OP-2, ASARECA will emphasize institutional strengthening of the NARIs in ‘less-participating’ countries (see Section 5.2 b).
(c) Other Unintended Outcomes and Impacts (positive or negative)

80. **Spillover Effects with respect to farmers and research staff.** Project beneficiaries reported that between 5 and 27 farmers learnt about the technology from them and a further 3-22 farmers then went on to take up the technology. Overall, beneficiaries surveyed reported passing on information to an average of 11.5 farmers, with 7.1 non-beneficiaries taking up the technologies. The process of project implementation provides time for non-project farmers to learn about the technology. Even taking out the high rates reported by specific projects, these estimates represent quite high spillover effects. Strengthening capacity at NAROs also benefits other projects.

81. **Leveraging new sources of support.** As ASARECA has implemented some of the activities under OP-I with other regional bodies and within the CAADP agenda, this has provided opportunities for scaling up successes, leveraging new sources of support from both political and financial stakeholders within and beyond the ASARECA region to implement the activities, and adaptation of the ASARECA model in other parts of Africa. At national levels, member-NARIs has committed to invest in ASARECA by paying some resources to the organization. Other impacts include: the President of DRC promoting the up-scaling of QPM; and ASARECA capitalizing on opportunities to partner with health sectors in various countries and partners who support better nutrition outcomes. ASARECA’s work has been mainstreamed into some Ministries of Health; especially in the areas of QPM and OFSP (with Vitamin A) encouraging young people to promote vine multiplier technologies. A project in Kenya on “Hidden Hunger” has also taken on promoting OFSP to prevented stunted growth.

3.5. **Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops**

82. The IE 2014 assesses the performance of ASARECA in meeting its’ OP-1 objectives. These findings are summarized in Annex 5.

4. **Assessment of Risk to Development Outcome**

   **Rating: low**

83. **The institutional risk to development outcome is low.** In addition to ASARECA’s stronger institutional set up, firmly embedded principals of FAAP in project implementation, and the various partnerships it has formed, ASARECA’s position as a regional platform for agricultural research is further strengthened through its linkages to the Eastern Africa Agricultural Productivity Programme (EAAPP). For OP-II, about US$4.2 million is expected to come through the EAAPP phase two, if implemented. Continued strengthening all of its institutional arrangements will be critical to addressing agricultural challenges that are relevant for the wider region and go beyond national interests. ASARECA has partnered with other projects and donors to strengthen the less competitive NARS and human resource capacities of member countries such as Rwanda, Burundi and Sudan. However, even the strong NARS may have some deficiencies that limit innovation, dissemination and scaling up (IE, 2014, p. 70). Under OP-II, ASARECA plans to actively assess capacities of all NARS to ensure continued integration.
84. The financial risk to development outcome is moderate. ASARECA currently fills a recognized need in the region for collaboration, leadership and technical support for national research and dissemination activities. Its value has been well demonstrated during OP-I. The limited core funding so far committed to OP-II poses a risk to ASARECA in terms of its financial sustainability as it may affect its current governance and management systems. The extent to which ASARECA will be able to sustain itself depends on its ability to mobilize resources for OP-II, not only from DPs but also from increased contributions by its member countries. The recent decision by the BoD (December 2013) to double member countries’ annual contributions from U$5,000 to U$10,000 is a first step in the right direction. To mitigate the financial sustainability issues, the ASARECA Secretariat has already launched its Resource Mobilization strategic implementation plan and has started to aggressively reach out to both the traditional and non-traditional funding agencies with the submission of 28 concepts and project proposals totaling US$ 80.8 million and through a series of face-to-face meetings. Effectiveness of this effort is yet to be seen.

85. The environmental risk to development outcome is low. Since the MTR identified key environmental shortcomings as discussed in Section 2.4, the environmental management system has improved, trainings have been successful, and substantial efforts have been made to enhance the monitoring of sub-projects.

86. The social risk to development outcome is low. It is likely that increasing agricultural productivity and incomes of farming households will improve food security, and the socioeconomic status of the poor in the ASARECA member countries.

5. Assessment of Bank and Borrower Performance

5.1. Bank Performance

(a) Bank Performance in Ensuring Quality at Entry

Rating: Satisfactory

87. The Bank team worked closely with ASARECA and the DPs to prepare the project and ensure harmonization of DP activities. ASARECA was an established institution with competent staff and with existing processes in place, such as M&E, FM and procurement systems. This made it easier to identify and address the gaps that required attention to enhance its overall performance. The Bank included lessons from ASARECA’s experience pre-MDTF, and identified risks and mitigation measures. The original PDO and outcome indicators were clearly linked to its activities (and subsequently refined in line with the Additional Financing).

(b) Quality of Supervision

Rating: Satisfactory
88. Supervision missions were conducted jointly with DPs, and included relevant specialists in areas such as bio-physics and safeguards to increase the intensity of support when needed, and the team worked together with the ASARECA Secretariat staff and other CGS partners to discuss the findings and produce comprehensive reports with recommendations for follow up. The MTR was a significant and participatory exercise that involved all MDTF donors. Aide Memoires and Implementation Status Reports (ISRs) were substantial and candid in identifying issues. The team is commended for: the follow up in ensuring Procurement and Safeguard Compliance, especially in providing procurement training that improved ASARECA and SG performance, and in identifying lapses in environmental safeguards at the MTR and warranting enhanced compliance; and in refining the RF under the Additional Financing, with indicators that were simple and measurable, including requiring reporting by gender. Activities under the MDTF were also coordinated with interventions by other partners and projects (i.e. EAAPP).

89. ASARECA staff in particular expressed their appreciation of the Bank’s role in administering the MDTF and eliminating reporting to multiple DPs. While staff view the internationally recognized standards set by the Bank as onerous to achieve, they appreciated that training they have received to meet these standards have benefitted them. Finally, the Bank team has made a notable effort during project implementation, working closely with ASARECA, to identify lessons and areas that need further work to enhance the design and content of the extended MDTF (from 2014-2018) and advance ASARECA’s performance under OP-II.

(c) Justification of Rating for Overall Bank Performance

Rating: Satisfactory

This reflects the ‘S’ ratings under Quality at Entry and Supervision.

5.2. Borrower Performance

(a) Government/Donor Performance

Rating: Satisfactory

90. The Government of Uganda (GoU) hosted ASARECA by providing physical space and grounds for constructing its own office. Furthermore, the GoU granted certain diplomatic status to the organization to enable it to recruit and retain well-qualified researchers and support staff from the region. Member countries have paid annual contributions (US$5,000) to ASARECA but unfortunately not all member countries have paid fully or regularly. Member countries need to consider increasing their contributions to strengthen ASARECA’s financial sustainability. The overall planning budget for OP-I (with a five-year time-frame from 2008) was US$96 million. ASARECA received US$84.1 million in total by end-December 2013. US$59.19 million came through the MDTF. As described under Section 5.1(b), the successes achieved under the MDTF can be attributed to the efforts of all DPs in providing the bulk of resources for OP-I, and in

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9 A Lead M&E Specialist from AFTOS participated in the MTR exercise and guided and advised the Task Team on the restructuring processes making sure that applicable policies and procedures are followed.
working together, including participating in annual joint missions, to assist ASARECA to achieve its mandate. DPs have also conducted detailed evaluations, including USAID (2011) of its support to ASARECA over a ten-year period, and DFID (Project Completion Review, 2014) adding to the knowledge and lessons in terms of enhancing ASARECA’s future performance.

(b) Implementing Agency or Agencies Performance

Rating: Satisfactory

91. ASARECA has done an outstanding job in implementing the MDTF under OP-I. Its leadership in reinforcing the working relationship with a range of stakeholders and implementers, from the Heads of NARIs and the overall NARS, to the beneficiary farmers has been instrumental in making the MDTF a success. ASARECA has not only put in place structures, systems and processes to support the functioning of the Secretariat and sub-projects, but it has also effectively used and refined its systems such as in M&E and capacity building initiatives to consistently improve the delivery and outcomes of its research programs. ASARECA has also responded in a timely manner to comply with Bank procedures, including in accounting and FM, to reduce the risk of fraud and corruption and to ensure that every dollar received is contributing towards the intended beneficiaries (DFID, 2014, p. 25). ASARECA has also taken steps to strengthen the relevance of gender as one of its core businesses. Beneficiary feedback and findings during the ICR mission endorse ASARECA’s success in implementing OP-I.

92. The imbalance of ASARECA’s grant funding contribution remains an issue of concern, in particular for those countries with less-participating NARS that receive less support. Some effort has been made to strengthen these NARS through human resource needs assessment, short courses, and mentorship. However; these have been implemented largely through special programs and have not involved the main “business process” of the competitive grant program. There is a clear tension between supporting high quality agricultural research and building capacity of the less competitive NARS (DFID, p. 15). As capacity strengthening is a key function of ASARECA, ASARECA needs to review the CGS mechanism to identify strategies to support organizations in countries that are currently under-represented, without compromising the ‘quality of science’. In OP-2, the addition of a criterion that each CGS application must include at least one ‘less-participating’ NARS (although it may be headed by stronger organizations) can help to reinforce these NARS. In this regard, lessons learned during the final years of OP-I should be strengthened and applied. However, this will come with added transaction costs given increased mentoring and capacity building efforts.

93. ASARECA has had relatively high overhead and support costs as noted in the external MTR and by DFID (DFID 2014). About 48 percent of the OP-1 budget was allocated to research project sub-grants, and 7 percent to capacity building for the grantees. The average expenditure to administrative, governance and operational expenditure has been between 25 -28 percent during OP-1. Part of the relatively high operational cost is explained by the shift in functions including a stronger knowledge hub management function. However, 28 percent is on the high side compared to 20 percent in similar institutions. ASARECA needs to conduct a critical examination of its cost structure and identify prospects for cost savings, to streamline administrative costs to an acceptable level.
(c) Justification of Rating for Overall Borrower Performance

Rating: Satisfactory

This reflects the ‘S’ ratings under Government/Donor and Implementing Agency performance.

6. Lessons Learned

Six lessons were learned from implementation of this project.

94. **First, agriculture research and development, especially field activities, requires sustained effort to be successful. Such an undertaking cannot be readily started, stopped and completed on a fixed timetable without compromising the results achieved.** As discussed in Sections 2.2 and 2.5 with regard to the EDF’s suspension, this lesson was carefully considered in the decision not to close the OP-1 MDTF and set up a new MDTF to support OP-2. Additional Financing under the MDTF in 2012 and the extension of the MDTF allowed for the continuation of funding and of activities and enabled a smooth transition from OP-1 to OP-2.

95. **Second, it is important for research and dissemination to address the entire value chain rather than focusing on only specific segments, and equally important not to overlook the policy landscape.** It is critical for research undertakings to identify the bottlenecks in the entire value chain. For example, farmers must not only be encouraged to adopt a technology such as better seed, but they need to be educated to look at markets. In addition, the arduous process of policy and regulatory reforms cannot be neglected. This is all the more important in regional projects involving intra-regional trade and numerous country-level decrees. For example, in Tanzania, farmers were trained in seed production, which led to increased seed supply. Farmers were also linked to markets that displayed demand for high quality seed. However, the policy environment limited the sale of seeds to only the immediate area (i.e. the local wards). In another instance, in Kenya, there was plenty of seed (for vegetables), but they could not be sold to Tanzania, as seed harmonization had not been approved for local indigenous vegetables. Production does not necessarily translate into a ready market.

96. **Third, it is important to ensure that information and knowledge flows are appropriate and up-to-date.** This again relates to assessing all the elements in a value chain. OP-1 has taught ASARECA that a project approach is not sufficient; ASARECA needs to become the focal point for knowledge generation and exchange, and serve as a sub-regional hub for data and information generated by agricultural research institutions. For this reason the ICU is being restructured under OP-2. A system’s databases must match the technologies available to ensure timeliness of information provision and to maintain a knowledge platform. With respect to raising awareness of stakeholders along the entire value chain, especially farmers’ awareness of the benefits of generated technologies, there should be better use of interactive communication tools, including social media tools. ICT could also provide an entry point to involve youth in value addition and markets.

97. **Fourth, it is important to be proactive in identifying and selecting partners in research and dissemination endeavors to achieve desired outcomes.** The MDTF was a success partly due
to the numerous partnerships that were formed and strengthened. At farmer level, a key lesson from OP-1 that is being used in OP-2 is: find ways to engage farmers and get them on board, and be seen as addressing their needs. Having a strong image and identifying with stakeholders makes it easier to approach them. ASARECA used many pathways to achieve this, including national farmer associations, NGOs, extension, farmer empowerment projects, discussion groups, and television. At higher levels, finding and working with partners with similar interests, for example, health ministries and donors supporting health outcomes, and others in agriculture (i.e. CGIAR, COMESA, and the Gates Foundation) can help complement and add value to a project’s activities. In regional projects, partner with member countries that have a comparative advantage in select areas of the value chain.

98. **Fifth, to ensure sustainability of the regional AR4D initiatives, sustainable and ensured source of funding is very important.** Since agriculture research on identified production and productivity challenges should be a continuous undertaking, a funding gap could seriously affect the outcomes. While ASARECA is dependent on DPs support for its regional AR4D initiatives, it is time to seriously consider other funding sources through its Resource Mobilization Action Plan, including more contributions from member countries, link with the private sector, generate own income, consider cost sharing arrangement with implementing institutions and more importantly implement the “Cost Containment Plan” recently approved by the BoD.

99. **Finally, research programs should work together to build on synergies and reap the corresponding benefits and not only have a commodity focus.** The reason for the three thematic areas under OP-2 is to break the silo focus and to emphasize greater interaction between the program-based disciplines and between countries.

7. **Comments on Issues Raised by Grantee/Implementing Agencies/Donors** (see Annex 7)

(a) Grantee/Implementing agencies
(b) Financiers/Donors
(c) Other partners and stakeholders
Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

<table>
<thead>
<tr>
<th>Components</th>
<th>Appraisal Estimate (USD millions)*</th>
<th>Actual/Latest Estimate (USD millions)*</th>
<th>Percentage of Appraisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research for Development</td>
<td>48.55</td>
<td>48.27</td>
<td>99.4</td>
</tr>
<tr>
<td>Support to ASARECA’s Governance Structures</td>
<td>1.56</td>
<td>1.65</td>
<td>105.5</td>
</tr>
<tr>
<td>Support to ASARECA’s Management &amp; Administration Structures</td>
<td>9.08</td>
<td>9.07</td>
<td>99.8</td>
</tr>
<tr>
<td>Management, Administration &amp; Supervision of the TF</td>
<td>1.74</td>
<td>1.74</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total Baseline Cost</strong></td>
<td><strong>60.93</strong></td>
<td><strong>60.73</strong></td>
<td><strong>99.6</strong></td>
</tr>
<tr>
<td>Physical Contingencies</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Price Contingencies</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Total Project Costs</strong></td>
<td><strong>60.93</strong></td>
<td><strong>60.73</strong></td>
<td><strong>99.6</strong></td>
</tr>
<tr>
<td>Project Preparation Costs</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Total Financing Required</strong></td>
<td><strong>60.93</strong></td>
<td><strong>60.73</strong></td>
<td><strong>99.6</strong></td>
</tr>
</tbody>
</table>

*Includes Additional Financing of USD million 5.09, 0.05, 0.42, and 0.04 respectively for the four components, as described in Section 1.5 of the ICR.

(b) Financing

<table>
<thead>
<tr>
<th>Source of Funds</th>
<th>Type of Cofinancing</th>
<th>Appraisal Estimate (USD millions)</th>
<th>Actual/Latest Estimate (USD millions)</th>
<th>Percentage of Appraisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust Funds</td>
<td></td>
<td>0.00</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>CAADP Pillar 4 institutions</td>
<td></td>
<td>60.93</td>
<td>60.73</td>
<td>99.6</td>
</tr>
</tbody>
</table>
Annex 2. Outputs by Component

The MDTF’s first three components sought to strengthen the integrated agricultural research for development (IAR4D) program based on ASARECA’s Operational Plan-I, and as described in Section 1.5 of the ICR. Component 1 focused on activities related to research generation, dissemination and adoption of technologies, innovations and management practices (TIMPs), while Components 2 and 3 aimed to strengthen ASARECA’s governance, management and administrative structures that were needed to successfully achieve outcomes.

The MDTF PAD and the Project Paper (PP) at restructuring present the MDTF Results Framework and Output Targets for the Intermediate Indicators. These are organized by five Output/Results areas in line with the ASARECA OP-I, rather than by MDTF Component. These areas, listed below, relate to and can be directly mapped to the MDTF’s Components. This Annex presents the MDTF outputs by Component, and also by Output/Result areas. Achievements under the Intermediate Indicators are listed following the text in this annex.

<table>
<thead>
<tr>
<th>MDTF Component 1 (Research for Development)</th>
<th>MDTF Components 2 and 3 (Governance and Management)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output/Result 2: Enhanced generation and uptake of demand-driven TIMPs.</td>
<td>Output/Results 1: Strengthened gender-responsive governance and management systems in ASARECA;</td>
</tr>
<tr>
<td>Output/Result 3: Enhanced adoption of policy options by decision makers to improve performance of the agricultural sector in ECA.</td>
<td></td>
</tr>
<tr>
<td>Output/Result 4: Strengthened capacity for implementing agricultural research for development in ECA sub-region.</td>
<td></td>
</tr>
<tr>
<td>Output/Result 5: Enhanced availability of information on agricultural innovation in ECA.</td>
<td></td>
</tr>
</tbody>
</table>

Project achievements/Outputs:

Component 1: Research for Development

Output/Result 2: Enhanced generation and uptake of demand-driven TIMPs

Under this output, ASARECA focused on the generation of TIMPs appropriate for the varied farming systems, as well as supporting the national systems in the identification of appropriate pathways, methods and approaches for up-scaling the identified TIMPs (see this Annex for a detailed list of definitions on Access, Innovation and TIMPs.)

For ease of tracking, ASARECA defined TIMPs under four main categories, those under: (i) research and development (in laboratories or controlled plots); (ii) field testing;

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(iii) validation (i.e. trials in fields by independent groups of scientists and other personnel); and
(iv) in uptake pathways, i.e. made available for transfer.

<table>
<thead>
<tr>
<th>Program</th>
<th>Ended Projects (since 2009)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MDTF</td>
</tr>
<tr>
<td>1. Staple Crops</td>
<td>22</td>
</tr>
<tr>
<td>2. High Value Non-Staple Crops</td>
<td>8</td>
</tr>
<tr>
<td>3. Agro-Biodiversity &amp; Biotechnology</td>
<td>10</td>
</tr>
<tr>
<td>4. Livestock &amp; Fisheries</td>
<td>17</td>
</tr>
<tr>
<td>5. Natural Resources Management &amp; Forestry</td>
<td>8</td>
</tr>
<tr>
<td>6. Policy Analysis &amp; Advocacy</td>
<td>9</td>
</tr>
<tr>
<td>7. Knowledge Management &amp; Upscaling</td>
<td>9</td>
</tr>
<tr>
<td>8. Information &amp; Communication</td>
<td>1</td>
</tr>
<tr>
<td>9. Partnerships &amp; Capacity Development</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>85</td>
</tr>
</tbody>
</table>

Source: ASARECA Annual Progress Report, January 2014, ASARECA M&E Unit, and ASARECA Finance Unit

The main TIMPs generated can be classified under the following categories: (i) Crop/Livestock Genetics & Breeding; (ii) Crop/Livestock Germplasm Conservation, Characterization &
Evaluation; (iii) Seed Multiplication; (iv) Disease & Pest Management; (v) Crop/Livestock Production Technologies; (vi) Post-harvest Handling & Value Addition; and (vii) Natural Resource Management.

Table 3. Fund allocation for all MDTF-funded Projects by Program (2009 - 2013)

<table>
<thead>
<tr>
<th>Program</th>
<th>Sub-Grant amount (US$ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staple Crops</td>
<td>3.35</td>
</tr>
<tr>
<td>High-Value Non-Staple Crops</td>
<td>1.58</td>
</tr>
<tr>
<td>Livestock and Fisheries</td>
<td>3.47</td>
</tr>
<tr>
<td>Agro-Biodiversity and Biotechnology</td>
<td>1.99</td>
</tr>
<tr>
<td>Natural Resource Management (NRM)</td>
<td>2.83</td>
</tr>
<tr>
<td>Policy Analysis and Advocacy</td>
<td>1.12</td>
</tr>
<tr>
<td>Knowledge and Up Scaling</td>
<td>3.49</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>17.83</strong></td>
</tr>
</tbody>
</table>

Source: Finance Department, ASARECA

Uptake of TIMPs was good. A total of 498 demand-driven TIMPs (12 percent above target were made available for uptake and adaption/adoption by stakeholders within the ASARECA-member countries. All TIMPs made available for uptake also fall under the same categories as above. This also included technologies that were already available (‘on the shelf’) where ASARECA supported the processes to make these technologies available. The rate of adoption of the already-generated TIMPs by stakeholders increased gradually from 20.6 percent in 2009 to 64 percent in 2013. Overall, based on the trends data, the average rate of adoption of available TIMPs over the five years was 42.2 percent compared to the OP-I target of 43.1 percent.

These new technologies included new crop varieties (i.e. cassava, sweet potatoes, sorghum, maize, green gram, Napier grass, climbing beans and banana), seed multiplication, new seed production technologies for vegetatively-propagated staples (i.e. banana), improved soil fertility and water management practices, improved pest and disease management practices (both crop and livestock), post-harvest management and value addition (i.e. dairy value chain, bee keeping), and enhanced NRM practices (i.e. afforestation, forage management, integrated agro-diversity and conservation management to promote eco-tourism).

**Output/Result 3: Enhanced adoption of policy options**

- **Output/Result Indicator 3.1**: Number of policies, laws, regulations and procedures analyzed
  Target: 78; Achievement: 100.

- **Output/Result Indicator 3.2**: Number of policies, laws, regulations and procedures presented for legislation or decree. Target: 54; Achievement: 46.

- **PDO Indicator 3.3**: Number of policy options approved (also a PDO indicator)
  Target: 28; Achievement 18.

In line with earlier findings from the USAID Evaluation (2011) and the independent MTR report (2011), the WB MDTF Final Review Mission (2013) concluded that this output met its
expectation by project closing, although not all indicator targets were fully met.

ASARECA defines policy analysis as a formal written analysis of a policy by a competent and experienced analyst, technical working group or its equivalent, teams, or consultants. It may include discussions and interactions with stakeholders and a desk review of relevant documents. This analysis can eventually form the basis and/or starting point for developing policy options.

With respect to policy analysis, dialogue and legislation, ASARECA worked very closely with various legislative bodies in the member countries, including the national Legislative Assemblies/Parliaments, the East African Community and COMESA. ASARECA’s contribution has come through two broad actions: support to research; and brokering of national policy changes. Through this collaboration, a total of 100 policies, laws, regulations and procedures were analyzed, and covered the following areas: (i) Harmonization of Root Crop Standards; (ii) Regional Quarantine Pest List; (iii) Analysis of Food Price Trends; (iv) Review of laws governing tick control in Kenya, Uganda & Tanzania; (v) Regional Intellectual Property Rights (IPR) Policy; and (vi) Adoption and diffusion of Integrated Water Management.

One example of a policy analysis for which ASARECA’s contribution was recognized and appreciated has been the policy research on trends in food price transmissions in Ethiopia, Kenya, Tanzania and Uganda. It showed the need for a clear roadmap to address the drivers of food price volatility instead of just responding to crises as they hit. As a follow up, a food price forecasting model is being developed and will be piloted and customized to inform early warning and response systems in the region. Data for the regional database has been collated for Ethiopia, Kenya, Rwanda, Tanzania and Uganda. The regional data portal can be accessed at https://sites.google.com/a/cgxchange.org/food-prices-portal/.

A total of 46 policies, laws, regulations and procedures were presented for legislation, decree and/or endorsement by responsible policy structures. Areas presented for dialogue and debate included: (i) Harmonization of Regional Biosafety Policies; (ii) Harmonized Root Crop Standards; (iii) EAC Seed Potato Standard; (iv) Regional Biosafety Policies; and (v) Rationalization & harmonization of policies (i.e. analysis of food trends).

A total of 18 were approved and/or passed for implementation. These policies focused on agricultural resources, food, market standards and regulations. Table 4 lists some of the kinds of research and research products led by ASARECA. The low achievement in the number of policies approved is due to the long and difficult process involving many preliminary steps.

An example of a policy option presented for legislation or decree which has been adopted is ASARECA’s contribution to the harmonization of 11 standards (cassava (7) and potatoes (4)) for the East African region, which was primarily driven by the EAC. The standards have been approved by the East African Standards Committee (EASC) and were subsequently declared by the East African Community (EAC) Council of Ministers to be used as East African Standards in 2009. In addition, the EASC identified 13 other standards and codes of practices to further harmonize standards.

Harmonized standards are seen as important to enhance farm-level production, utilization and
The harmonization of cassava standards had a positive impact on farmers’ livelihoods through increased income derived from better marketing opportunities locally and regionally. For instance, it encouraged the Popular Kumi Women Initiative (Uganda) with its membership of 2,500 to grow cassava and sunflower, as processed sunflower oil and cassava flour have a ready market in Uganda’s urban centers. The sales from these products resulted in increased

With regard to impacts of an improved seed policy environment, ASARECA’s support to enhancing the enabling policy environment for seed trade in the region has mainly been through the Eastern Africa Seed Committee (EASCOM). Since the regional agreement on harmonization of seed policy in 2004, countries are currently at various levels of its domestication with Tanzania in the lead. A policy impact study on the improved harmonization of regional seed policies led by ASARECA showed that by 2010, seed production within the region had tripled from 43,000 tons to about 122,000 tons. Domestic and cross-border seed trade has also increased threefold from 1,000 tons due to policy reforms, thus leading to growth in volumes of seed traded. For example in Uganda, the private sector has nearly taken over the role of seed production. Uganda with its 32 seed companies has fully liberalized seed trade with the government retaining the role of regulation with options to cede some authority to accredited seed companies (DFID 2014, p. 10-11).11

Table 4. Policy-Related Areas led by ASARECA in OP-1

<table>
<thead>
<tr>
<th>Broad Policy Areas</th>
<th>Geographic Scope</th>
<th>Constraint/Problem Identified</th>
<th>Research (related) Output</th>
<th>New Policy/Practice Adopted</th>
<th>Impact Pathway Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed Harmonization</td>
<td>Burundi, DR Congo, Ethiopia, Kenya, Madagascar, Rwanda, Sudan, Tanzania and Uganda</td>
<td>Growth of seed sector constrained by different and often contradictory policies, regulations and procedures</td>
<td>Harmonized seed certification, variety release, phytosanitary measures, plant variety protection, and import export</td>
<td>Harmonized policies, laws and regulations and procedures</td>
<td>Movement of germplasm across countries, private sector involvement in seed production and trade, more varieties available to farmers</td>
</tr>
<tr>
<td>Informal dairy</td>
<td>Burundi, Kenya, Rwanda, Tanzania and Uganda</td>
<td>Limited recognition of informal milk sector</td>
<td>Evidence supporting policy reforms and guidelines on safe handling of informal milk by players across the value chain</td>
<td>Harmonized policies, laws and regulations and procedures</td>
<td>Trade in milk products across countries, informal traders these milk products, more market outlets available to small farmers</td>
</tr>
</tbody>
</table>

11 For example, the policy analysis paper ‘Impacts of an improved seed policy environment in Eastern and Central Africa’ by M.Waithaka, J.Nzuma, M.Kyotalimye, and O.Nyachae (ASARECA, 2011) analyzed the positive impact of harmonized seed policies across the region in terms of increased seed production and regional seed trade. It proposed policy recommendations to further strengthen the harmonization of seed policies within the region.
Output/Result 4: Strengthened capacity for implementing agricultural research for development

Output/Result Indicator 4.1: Number of ASARECA projects that have incorporated gender responsive agricultural innovation. **Target: 103; Achievement: 99.**

Output/Result Indicator 4.2: Number of stakeholders whose capacity building needs have been addressed. **Target: 89,375; Achievement: 81,834 (56 percent male; 44 percent female).**

Output/Result Indicator 4.3 Number of partner institutions with infrastructure capacity strengthened. **Target: 355; Achievement: 471.**

Output/Result Indicator 4.4 Number of partnerships formed **Target: 238; Achievement: 293.**

Over 96 percent of the implemented projects incorporated gender responsive agricultural innovation system approaches, since most of the projects targeted women even at the project design stage. This approach, coupled with selection of gender responsive indicators, ensured that the projects addressed gender issues, including the needs of women, youth and other disadvantaged groups. This approach was also very helpful during the selection of individuals for targeted short- and long-term trainings.

Overall, 81,834 stakeholders benefited from capacity strengthening initiatives that were focused on short- and long-term trainings. ASARECA contributed to capacity development of research processes in member countries at various levels. The cadre of researchers (PhD and Masters)
from different countries who have been trained within and outside Africa has contributed to the new knowledge and skills pool. This has increased the capacity of the NARS, making a significant difference to the weaker NARS and to key areas of other NARS. Training of the 150 researchers was as follows: 15 PhD (9 male; 6 female); 112 MSc (73M; 39F); 4 BSc (2M and 2F); and 19 Diploma/Certificates (12M; 7F). These initiatives covered individual day sessions, multi-day workshops and a series of inter-related trainings and workshops.

ASARECA offered short term professional development training opportunities for staff involved in ASARECA supported research activities including, Integrated Pest Management (IPM), laboratory management, plant disease diagnostics, agricultural innovation systems approaches and value chain development and more program management oriented training such as M&E skills, gender awareness, financial management and procurement.

ASARECA also facilitated access for young and mid-level scientists to training opportunities supported by other programs. For example, SCARDA, funded by DFID through the Forum for Agricultural Research in Africa (FARA), was launched in 2007 to cover three member countries (Rwanda, Burundi and Sudan). It contributed by strengthening competencies and capacity in agricultural research management through an experimental learning process and putting mentoring and coaching practices in place. SCARDA also supported 40 young and mid-level scientists (out of the 150 students mentioned above) from several ASARECA countries with training at MSc level at five universities in the ASARECA sub-region in various disciplines, including plant breeding, horticulture, animal science, agricultural information and communication management, research methods and range management. SCARDA has also helped the countries in leveraging resources to complement efforts by ASARECA towards improving the research capacities in the region.

Overall, ASARECA has facilitated access to capacity building activities for a large group of beneficiaries but it should be noted that not all training and capacity building activities was directly supported by ASARECA but also included other capacity building programs such as SCARDA and the linkages established with the ILRI-BeCA hub.

ASARECA’s Results Framework also tracks the number and type of various infrastructure provided to various institutions. For example, 471 different types of infrastructure have been funded and/or provided to the NARIS, representing 133 percent achievement of OP-I targets. Support to improving infrastructure has been important to enable researchers to conduct high quality research by having access to appropriate and up-to-date research equipment. Examples of such infrastructure investments include gene banks, computers, laboratory and building refurbishment, screen houses, nurseries, biodiversity monitoring kits, irrigation kits, and forage choppers.

The regional collaborative research programs have fostered the development of numerous partnerships among several agricultural research actors within the region. These partnerships have allowed for an exchange of knowledge and experiences across different institutions when dealing with similar challenges. ASARECA defines a partnership formed when there is a clear, written agreement or Memorandum of understanding or exchange of letters, to work together to achieve a common objective, including specification of the contributions of the parties involved.
Through capacity development support, 293 partnerships have been either formed or strengthened (exceeding OP-I targets by 23 percent) with strategic partners. Through these partnerships, research outputs (increased marketing of commodities, institutional mentorship of scientists, adoption of selected TIMPs, etc.) have been noted. Various forms of partnerships were formed, predominantly among NARS actors across the region.

For example, some of the competitive research grants stipulated that collaborative research projects should be carried out in at least 3 countries involving different actors, such as research institutes, universities, advisory services providers, private sector, farmer organizations and non-state actors. However, due to capacity issues and access to information, the majority of the grants were awarded to a relative small group of actors in three countries within the region.

For a good part of OP-1, three countries (Kenya, Uganda and Tanzania) dominated the competitive research grants arena, reflecting the principle of best quality research winning the grant awards and historically, closer cooperation between these countries in forming consortia. In total, 57 percent of all projects were granted to Kenya, Uganda and Tanzania, 3 out of 11 countries. In terms of budget resource allocation, the imbalance is even more apparent, with 68 percent of total project budgets allocated to these three countries, with the remaining 32 percent allocated to the other 8 countries, with in particular countries such as Eritrea, Congo, Sudan, Madagascar and South Sudan had minimal access to funds and technical support.

Some effort has been made to support the less participating NARS through human resource needs assessment, short courses, and mentorship. However; these have been implemented largely through special programs and have not involved the main “business process” of the competitive grant program. The continuing imbalance of ASARECA’s grant funding contribution remains an issue of concern, in particular for those countries that receive less ASARECA support. ASARECA plans to address this issue under OP-II.

ASARECA has also developed and intensified its linkages with the Consultative Group on International Agricultural Research (CGIAR) Centers. By the end of 2013, ASARECA is partnering with 11 of the 15 CGIAR Research Programs (CRPs) either through: (a) strategic policy and regulatory work; (b) use of CRPs as implementers of a research task in ASARECA supported research; and (c) ASARECA serving in the governance of the CRPs. By and large, the interaction follows subsidiarity principles involving the global input from CRPs to complement the regional agenda. ASARECA has also initiated a capacity building cooperation with the BecA-ILRI hub which is perceived of having been successful. The WB mission review suggests that the CGIAR consortium could be an important partner for exploring wider opportunities for capacity building for the NARS across the CRPs. For resource mobilization, ASARECA may explore opportunities to participate and to access funding in the next round of CRPs to be launched in 2017. The CGIAR also has a wealth of information and data that could support the policy work in ASARECA.
Output/Result 5: Enhanced availability of information on agricultural innovations

Output/Result Indicator 5.1: Number of information packages produced  
**Target:** 812; **Achievement:** 885.

Output/Result Indicator 5.2: Number of appropriate information delivery pathways used.  
**Target:** 267; **Achievement:** 272.

Output/Result Indicator 5.3: Number of people reached with information packages through different pathways used. **Over 5,000,000.**

Output/Result Indicator 5.4: Level of satisfaction of stakeholders accessing disseminated information. **Target:** 75 percent; **Achievement:** 87.6 percent.

This output was critical to ASARECA’s commitment to achieving its purpose level statement of ‘enhanced utilization of agricultural research and development innovations in Eastern and Central Africa’. This required a consolidated contribution from all ASARECA staff and their sub-grantees. ASARECA fully recognized the importance of creating robust communications strategies for its different outputs. The units within ASARECA taking the lead for this output are the M&E team, the Knowledge Management Programme unit and the ICT unit. Different strategies of sharing research outputs were used, taking into account the different users and their needs. Some of the communication strategies were successful and others less successful. This output is assessed by a combination of 2 quantitative indicators around number of information packages produced and information delivery pathways used. Another critical indicator looks at the stakeholders’ satisfaction of accessing the disseminated information.

By end of 2013, ASARECA has achieved 109 percent and 102 percent respectively of their two quantitative performance targets for this output to the end of the OP-I period. Over 2 million people accessed 885 available information packages (indicator 1) which included peer reviewed journal articles, manuscripts, books and book chapters, conference proceedings, electronic newsletters and documentaries. Among the 272 delivery pathways (indicator 2) used included websites, agricultural shows, television, radio, field days, media events, workshops, etc. Based on feedback from stakeholders who accessed some of the disseminated information, a total of 87 percent of the beneficiaries expressed satisfaction with the information products, which is above the target of 75 percent (indicator 3).

Components 2 and 3: ASARECA’s Governance and Management Structures

Output/Results area 1: Strengthened gender-responsive governance and management systems in ASARECA.

The overall goal in the area of governance was to establish a system that would enhance ASARECA’s ability to fulfil its mandate, and, more specifically, establish and operationalize appropriate governance and management structures, systems and procedures. The indicators
listed below related primarily to establishing a diverse decision making process including stakeholders outside of the ten member countries’ NARI Director Generals, reviewing the Constitution, updating ASARECA’s ten-year old legal, governance and management instruments, establishing a fully-staffed Secretariat, improving the guidelines and use of the guidelines for procurement, financial management and general administration, and reviewing the headquarters agreement.

Output/Result Indicator 1.1: Pluralistic decision-making process.
ASARECA has continued to promote governance that is hinged on promoting pluralistic decision-making approach. This approach involves the engagement of multiple participants that combine and "pyramid" their "resources" to shift decisions in separate "issue areas" without privileging any particular viewpoint. Various stakeholders with diverse skills, capacities and experiences from the NARIs, Universities, NGOs, Farmer Organizations, Public and Private sectors were engaged in various fora, including the ASARECA General Assembly, Strategy development (e.g. Gender Mainstreaming), Board of Directors’ meetings, as well as during internal and external reviews.

Output/Result Indicator 1.2: Compliance with organizational operational procedures and standards.
It is noteworthy that ASARECA has made good progress in delivering stronger governance and management systems, including overall gender responsiveness. It has also consolidated its planning processes into the Operational Plan (OP), whose implementation is ensured by having comprehensive annual work plans and budgets.

Output/Result Indicator 1.3: Percentage growth in research funding
During the OP-I implementation period (2008/9 - 2013), the overall planned budget for ASARECA-supported activities was US$96 million. However, US$84.1 million was received by end of December 2013, including the MDTF’s share of US$59.1 million. The implementation period noted a steady increase in replenishment of the funds from MDTF (and other donors), even though there was no additional unrestricted core funding added to the MDTF after its set-up. For example, MDTF helped in leveraging additional funds for earmarked projects from other development partners, thus joining the pool of the African Development Bank (AfDB), Institute for Development and Research Centre (IDRC), Swedish International Development Agency (SIDA) and Eastern African Agricultural Productivity Program (EAAPP).

Output/Result Indicator 1.4: Rate of implementation of the new ASARECA constitution.
When the MDTF was signed in November 2008, ASARECA had an old Constitution that mandated it to focus mainly on agricultural research. It also had Committee of Directors (CoDs) made up of 10 NARI Directors who provided policy guidance to the Association. As stipulated in the 2008 OP, there was a need to develop a new constitution that accommodated the transition from the previous Networks, Programs and Projects (NPP) mode into Programs mode and, a need to transform the CoD to a new Board that had a much broader mandate and responsibility. As a result, under the MDTF, a new constitution was drafted, approved by the new Board and ratified by four member governments - Ethiopia, Kenya, Madagascar, and Rwanda - enough to make the
constitution effective. The MDTF supported the governance of ASARECA through the review and revision of the ASARECA Constitution.

**Governance Manual (GM).** When the MDTF was signed, there was no GM. The new constitution established organs and institutions of the Association and, the BOD subsequently issued a GM, which is a complement to the Constitution, to set out the roles, functions, responsibilities and decision-making processes. The GM showed the relationships between ASARECA and its principal stakeholders in the governance process and serves as a reference document for the stakeholders of ASARECA who wish to know how the Association is governed. The manual is a guide to the management of the affairs of the Association and is intended to ensure that ASARECA observes the principles of good governance. The MDTF supported the review and revision of the GM.

**An expanded Board of Directors (BoD).** The new constitution created a new representative BoD, and expanded membership from 10 to 18 members comprising: 11 Director Generals of NARIs, representatives from the Universities, NGOs, Private Sector, Farmer Organizations, COMESA, Agricultural Extension Services, and CG centers (15 men and 3 women). This has enabled other stakeholder groups to have a stronger voice in matters related to ASARECA’s direction and operations. The Board has Committees and includes the Executive, Audit and Finance, Nominating and Program Committees. The functions of the BoD and its sub-committees are defined in the governance manual, and regular meetings have been held and documented. The MDTF provided support to meetings of the expanded BOD and other means necessary for the BOD to provide strategic oversight.

**In the area of management, ASARECA’s Secretariat was established and is fully functional.** It comprises the Executive Director (ED), the Deputy ED - Programs, eight research programs and ten support units. The Secretariat is responsible for the day-to-day management of ASARECA’s programs and units. It has continued to grow since its restructuring in 2009 and has attracted high caliber professional staff to run the new programs and units. In the last year, there were changes to the Secretariat’s organization and structure in response to recommendations made during implementation review missions, and also to prepare the necessary institutional infrastructure that can fully support the implementation of OP-2. These include the creation of a Gender Unit, a new Environment and Social Safeguards Unit, and an Information and Communication Technology Unit. The MDTF helped to strengthen the capacity of the ASARECA Secretariat by updating its systems and contributing to its operational costs and capital equipment.

**Operational Manual (OM).** There was no ASARECA OM at the start of the MDTF. The OM, which is updated as the need arises, sets forth detailed guidelines and procedures for implementing ASARECA’s program, and guides day-to-day operation of the Secretariat.

**Headquarters Agreement:** The old agreement that registered ASARECA as an “Inter-Governmental Association” has been revised and a new Headquarters Agreement was approved by the Government of Uganda.

**Headquarters Building.** Land for the construction of Headquarter building is secured and architectural and design work redesigned. Construction is expected to commence in 2014.
The MDTF supported many outputs to strengthen governance and management including support to the Office of the Executive Director, Internal Auditor, procurement, financial management and information and communication management. MDTF support also helped ASARECA to make significant progress in developing M&E tools and promoting results-based management. Training workshops were organized for the ASARECA Program Managers, Principal Investigators, Project Scientists, and selected stakeholders to strengthen their skills and ability to apply M&E concepts and approaches for the key areas of ASARECA interventions. The M&E unit also assessed the status of M&E activities within 11 selected NARIs.

ASARECA put considerable effort into getting these governance structures in place in the first and second year of the MDTF and OP-I. Bank missions have reviewed the key governance documents, the Board agenda and interviewed relevant people, and concluded that the structures and arrangements are fit and appropriate for the purposes of ASARECA.

### ASARECA MDTF Outcome and Intermediate Results Indicators

<table>
<thead>
<tr>
<th>Project Outcome Indicators</th>
<th>Unit of Measure</th>
<th>Baseline 2008</th>
<th>Target and Cumulative Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator 1: Number of stakeholders accessing the technologies and innovations</td>
<td>Number</td>
<td>2,014</td>
<td>7,370 (7,120)</td>
</tr>
<tr>
<td>Indicator 2: Percentage of stakeholders adopting new technologies and management practices in selected development domains (desegregated by gender)</td>
<td>Percent</td>
<td>8.3</td>
<td>18 (20.6)</td>
</tr>
<tr>
<td>Indicator 3: Number of reform of policies, laws, regulations and procedures approved</td>
<td>Number</td>
<td>6</td>
<td>- (-)</td>
</tr>
<tr>
<td>Indicator 4: Level of satisfaction with technologies and innovations</td>
<td>Percent</td>
<td>5 percent</td>
<td>33.3 (11.5)</td>
</tr>
<tr>
<td>Indicator 5: Number of direct beneficiaries reached through ASARECA support (disaggregated by gender)</td>
<td>Number</td>
<td>12,084</td>
<td>44,220 (42,720)</td>
</tr>
</tbody>
</table>

**INTERMEDIATE RESULTS**

**Output 1: Strengthened gender responsive governance and management systems in ASARECA**

<table>
<thead>
<tr>
<th>Indicator 1: Pluralistic decision making processes</th>
<th>10 NARIs in Board</th>
<th>On course</th>
<th>On course</th>
<th>On course</th>
<th>On course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator 2: Compliance with organizational operational procedures and standards</td>
<td>Percent</td>
<td>No OM &amp; GM</td>
<td>On course</td>
<td>On course</td>
<td></td>
</tr>
<tr>
<td>Indicator 3: Percentage growth in research funding</td>
<td>Percent</td>
<td>5.70 (14.98)</td>
<td>30 (30.6)</td>
<td>50 (48.4)</td>
<td>65 (61)</td>
</tr>
<tr>
<td>Indicator 4: Rate of implementation of the new ASARECA Constitution</td>
<td></td>
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<td></td>
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<tr>
<td>Output 2: Enhanced generation and uptake of demand driven agricultural technologies and innovations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indicator 1:</strong> Number of demand-driven technologies/ innovations generated</td>
<td>Number</td>
<td>57</td>
<td>40 (35)</td>
<td>129 (106)</td>
<td>241 (211)</td>
</tr>
<tr>
<td><strong>Indicator 2:</strong> Number of demand driven technologies available for uptake</td>
<td>Number</td>
<td>15</td>
<td>117 (86)</td>
<td>217 (171)</td>
<td>311 (275)</td>
</tr>
<tr>
<td>Output 3: Enhanced adoption of policy options by decision makers to improve performance of the agricultural sector in ECA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indicator 1:</strong> Number of policies, laws, regulations and procedures analyzed</td>
<td>Number</td>
<td>6</td>
<td>3 (15)</td>
<td>16 (26)</td>
<td>37 (51)</td>
</tr>
<tr>
<td><strong>Indicator 2:</strong> Number of policies, laws, regulations and procedures presented for legislation or decree</td>
<td>Number</td>
<td>6</td>
<td>2 (11)</td>
<td>12 (19)</td>
<td>26 (28)</td>
</tr>
<tr>
<td>Output 4: Strengthened capacity for implementing agricultural research for development in ECA sub-region</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indicator 1:</strong> Number of ASARECA projects that have incorporated gender responsive agricultural innovation systems</td>
<td>Number</td>
<td>3</td>
<td>3 (5)</td>
<td>30 (32)</td>
<td>51 (52)</td>
</tr>
<tr>
<td><strong>Indicator 2:</strong> Number of stakeholders whose capacity building needs have been addressed</td>
<td>Number</td>
<td>200</td>
<td>511 (3,872)</td>
<td>27,152 (30,777)</td>
<td>50,782 (45,064)</td>
</tr>
<tr>
<td><strong>Indicator 3:</strong> Number of partner institutions with infrastructure capacity strengthened</td>
<td>Number</td>
<td>66</td>
<td>25 (23)</td>
<td>140 (139)</td>
<td>261 (250)</td>
</tr>
<tr>
<td><strong>Indicator 4:</strong> Number of partnerships formed</td>
<td>Number</td>
<td>32</td>
<td>43 (47)</td>
<td>86 (91)</td>
<td>132 (140)</td>
</tr>
<tr>
<td>Output 5: Enhanced availability of information on agricultural innovation in ECA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indicator 1:</strong> Number of information packages produced</td>
<td>Number</td>
<td>82</td>
<td>99 (130)</td>
<td>268 (286)</td>
<td>486 (565)</td>
</tr>
<tr>
<td><strong>Indicator 2:</strong> Number of appropriate information delivery pathways used</td>
<td>Number</td>
<td>22</td>
<td>40 (38)</td>
<td>92 (90)</td>
<td>150 (149)</td>
</tr>
<tr>
<td><strong>Indicator 3:</strong> Number of people reached with information packages through different pathways</td>
<td>Number</td>
<td>TBD</td>
<td>&gt;5,000,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indicator 4:</strong> Level of satisfaction of stakeholders accessing disseminated information</td>
<td>Percent</td>
<td>35</td>
<td>65 (69.3)</td>
<td>68 (73.3)</td>
<td>70 (65.2)</td>
</tr>
</tbody>
</table>
Specific Outputs and Outcomes under Component 1: Research for Development

The following provides a brief summary of selected key achievements of MDTF-supported ASARECA interventions.

Crops/Livestock Genetics & Breeding
1. In Uganda (Masaka and Kumi Districts), intercropping forage Napier grass with the forage legume *Centrosema pubescens* increased fodder availability compared to pure stand of Napier grass by 50 percent, crude protein (CP) content by about 20 percent and feeding period (number of days a cow was able to feed on fodder from a given area of land) by about 30 percent. Roof catchment underground water harvesting tanks with capacity of 35,000 litres were introduced on 24 farms to improve water availability for agricultural and domestic use. With a seasonal water availability of >35,000 litres, a shift in family labour from fetching water to other income generating activities was recorded. Availability of improved milk yield and household income by 80 percent and 52.4 percent, respectively was also noted, while the area under forage production, fodder quantity and water availability increased by about 134 percent, 76 percent and 46 percent, respectively.

2. Improved livestock management using improved productivity-enhancing technologies for smallholder dairy project proved beneficial to the farmers. For example, a total of 318 households received Artificial Insemination (AI) services, leading to insemination of 1,201 cows and the birth of 753 improved calves, while 370 cows are in calf. A further 17 calves were produced through embryo transfer in Rwanda (Rwamagana). So far, over 700 small-scale farmers have adopted AI services.

Crops/Livestock Production
3. In Kenya, in a span of 2 seasons, the adoption of seed selection techniques resulted in increased potato yields from an average of 2.8 tons (worth US$1,150/acre) to over 7.5 tons (worth >US$3,000/acre). As a result, some farmers are now using the techniques to produce more seed potato for sale to other farmers. In Burundi, a total of 14 farmer groups, comprising 140 farmers (47M, 93F) have benefited from interventions aimed at enhancing the utilization of quality seed potato by small-scale farmers. As a result, they recorded 140 percent increase in potato yield, from 5 to 12 tons/ha, from the baseline/pre-project productivity.

4. On the other hand, the promotion of ready markets for seeds of African Indigenous Vegetables has benefited targeted farmers and private investors. Through contract farming between farmers and selected seed companies (e.g. Kenya Seed Company) in western Kenya, the companies are assured of meeting their production while farmers (comprising 83 women) are guaranteed ready markets. One of the beneficiaries of this contract farming earned a net income of US$17,000, while another female farmer received US$3,383 from her 0.4 ha piece of land within two seasons through the planting of jute mallow and Crotalaria. In general, a total of 11 farmers received an average annual income of US$3,500 from sale of certified AIV seed.

5. In Uganda, farmers are using *Brachiaria mulato* introduced by the project for hay making for sale. A 20 Kg bale of hay sells at US$4. As a result of this income-generating opportunity, a small scale farmer in Mityana district that obtained planting material from the project has started
commercial hay production, and is selling over 200 bales per month at US$5 per bale. On the other hand, in Kenya, a total of 31 farmers are making hay from Rhodes grass (*Chloris gayana*) and the number of hay bales (14-21 kg) per household ranges from 40 to 150. This has a value of between US$160 – US$600 for these farmers.

6. In Uganda and Tanzania, the utilization of improved livestock feed technologies has resulted in an increase in milk production from 6 to 11 and 6 to 8 litres/cow/day respectively, resulting in increased incomes. For example, in Uganda where the average cost of milk is US$0.35/litre, each household generated an average of US$3.85/cow/day, leading to an average monthly income of US$115/cow. On the other hand, the daily consumption and sales of milk has resulted in significant impact on people’s health, with some reported cases of reduced kwashiorkor in the communities.

7. Sorghum ox-weeder being adopted in Tanzania reduces drudgery by 75 percent per acre, thus saving US$125 as labor costs for the farmers. On the other hand, the prototype labor saving technologies (hay balers and forage choppers) have been developed for reduction of labor drudgery especially for women dairy farmers.

8. With regards to enhancing utilization of bean innovation to enhance food availability, a total of 34,155 households (204,930 individuals) have benefited, and are currently accessing improved varieties, leading to production of over 69 tons of breeder/foundation seed (Uganda – 10.85 tons; Rwanda – 48.5 tons; Burundi – 9 tons; and DRC – 0.7 tons). Some of these seeds were planted for further multiplication, and eventually for sale. So far, over 518 tons have been produced and availed to the market as certified and quality declared bean seed.

9. Through the use of gender-responsive climbing bean technologies, especially the wood stakes, over 1,000 farmers in Rwanda realized increased yields, ranging from 1,013 to 3,467 kg/ha, as well as higher economic returns of US$950/ha. Similarly, using cord as stakes, each farmer harvested between 780 and 3,500 kg/ha, thereby receiving economic returns of US$1,300 compared to very low returns before the intervention. In areas where intercropping was practiced, yield increases were observed. For example, where the individual farmer intercropped climbing bean with maize, the yield range was 367 to 2,100 kg/ha, and the average economic return was US$2,030.

10. In Uganda, the current highland maize varieties (long season and high yielding) produce grain yield of about 9 t/ha compared to 2.3 t/ha from the lowland varieties. The most productive varieties (4 new hybrids) that have been included in the National Performance Trials (NPT) can yield more than 12 t/ha, which is 25 percent more than the current imported Kenyan varieties. It is expected that the release of any of these varieties will help farmers in the ECA region address food security issues.

11. More than 70 tons of both certified and quality declared bean seed of climbing, bush and snap beans has been produced by small seed farmer groups, associations and partnering seed companies in Uganda, Burundi, Rwanda and the Democratic Republic of the Congo.
12. In Kenya and Tanzania, a study conducted to assess the effect of irrigation and cattle manure application on vegetable (*Solanum aethiopicum*) production showed that vegetable yields and revenue increased by over 500 percent (i.e. 25 to 200 bundles), leading to a net profit of US$1,415/ha/season.

13. Through the tissue culture interventions, over 200 Ugandan farmers and a potential number of farmers from the participating countries have, and are likely to benefit from clean disease and virus free plantlets of cassava, sweet potatoes and banana. On the other hand, tissue culture laboratories have lowered the cost of production of tissue culture plantlets by 40 percent by using more innovative and cost-effective methodologies. The use of virus indexing techniques in tissue culture has assured farmers of quality and disease-free materials, resulting into 60 percent higher yields.

14. As part of the initiatives to enhance productivity of cabbages, cheap and readily available but effective manures were used by farmers in Masaka, Uganda who significantly enhanced their cabbage yields. For example, the average yield (15.4 t/ha) of cabbages from manured plots was 157 percent higher than the yield (6.0 t/ha) obtained from plots where no manure was applied. The cabbage heads obtained from poultry manured plots were 9 percent, 49 percent and 95 percent heavier than the heads obtained from goat, cattle and non-manured plots, respectively. The study clearly showed that poultry manure could confer significant benefits to cabbage producers at a relatively low cost, given that most of the farmers in the project area keep poultry.

15. In, Masaka, Uganda, fodder and grain yield increased by 26 percent and 6 percent respectively when maize was intercropped with the forage legume, *Lablab purpureus*. This approach led to a weeding cost saving of about US$50/ha for the targeted farmers, thus cushioning the farmers who intercrop maize-laabl against feed gap during the dry season.

16. In the Eastern Province of Rwanda, ASARECA’s support to COPROVIBA (a community-based cooperative) has contributed to an increase in weekly production of banana beverage from 200 crates (i.e. 9,600 crates) in 2009 to the current 1,200 crates (57,600 crates annually). Currently, the cooperative earns US$10,000 per week as compared to US$1,700 per week in 2009. This has boosted the production of banana by the farmers in Ngoma, where they supply up to 3 tonnes of banana bi-weekly to the cooperative. The farmers receive an average of US$0.13 per kilogram of banana supplied to the cooperative, which has also turned out to be a sure market for them.

17. In Goluj, Eritrea, farmers now obtain yield of 1.8 tons/ha after adopting improved pearl millet varieties and sell the seed to the Ministry of Agriculture at a premium price 25 percent over traditional varieties. Similarly, in Sudan, pearl millet innovations have benefited over 3,500 farmers, besides an annual yield increase from an average of 8.7 to 16 bags (100 kg) per hectare. In Kenya, one of the farmers in the semi-arid lands of Baringo County produced and sold 500 kg of pearl millet to Egerton University for distribution to other farmers. Besides this, she also produced and sold 500 kg of groundnuts and 300 kg of pigeon peas. She generated a net income of US$1,160 from the previous season’s sales.
18. With regards to linking best practices in integrated soil-water and nutrient management, rice farmers in Korogwe District, Tanzania have realized significant increase in crop yields in their “best-bet” plots compared to “farmer practice” plots. Benefit-cost ratios of between 2 and 15 were recorded for “best-bet” plots, leading to increased annual net income from US$44 to US$625/farmer/ha. On the other hand, the number of farmers linked to new markets increased from 15 to 150 for onion and chickpea, and from zero to 80 for lablab produced in rotation with rice.

19. Significant positive impacts of the short-term targeted trainings for the farmers have been noticed, leading to multiplier effects and increased levels of success of the ASARECA initiatives. For instance, 50 percent and 733 percent increment in potato yield and bean production respectively, was recorded by Burundi farmers, besides a 39 percent and 78 percent increase in milk production in Kenya and Uganda respectively. In Tanzania, there was 100 percent increase in the daily milk production during the dry and wet seasons (i.e. 2 to 4 litres/cow in dry season and 4 to 8 litres/day in wet season). For example, in some previously degraded project areas like Melkassa in Ethiopia, the following results were realized through the integrated management of water for productivity and livelihood security under variable and changing climatic conditions project:

(a) Farm production of selected commodities increased by over 50 percent from the baseline. The technology testing and adaptation results also show significant increases in crop yields, viz.: maize 78 – 99 percent; tef 11 – 12 percent; haricot beans 13.6 – 14.3 percent; wheat 29 – 100 percent; and barley 0.4 percent - 12.2 percent percent.
(b) Over 348 percent moisture retention on the farmlands was achieved through the application of in-situ moisture conservation practices such as tied ridges in the model watershed;
(c) Significant improvements in trees and grass cover have been recorded, especially in areas that had no vegetation at all. These areas have also recorded rainfall of up to 47mm per day (from a record of scantiness).

Disease & Pest Management

20. ASARECA interventions in selected project sites in Uganda, Tanzania and Burundi resulted in significant reduction in the occurrence of the Banana bacterial wilt (BXW) disease. For example:

(a) In Uganda (Bushenyi, Ntungamo and Mbarara), the proportion of farmers who managed to control the disease increased from below 5 percent percent to over 60 percent and banana production recovered from total loss to 60 percent of the previous production levels in 15 months. Given that the average production of banana under optimal conditions and appropriate agronomic practices is 80 bunches/acre, these farmers increased their production to over 50 bunches per month (at20kg). Based on prevailing farm-gate prices of US$ 6/bunch, each farmer generated an average monthly income of US$300. On the other hand, organized farmer groups in Western Uganda earned as low as US$30 per month from their infected farms in 2009. However, in less than 3 years, these same farmers’ group earned US$
21,600 (a monthly increase from US$30 to US$600). The production levels and sales are still increasing.

(b) In the Eastern Province of Rwanda, stringent by-laws crafted by the communities themselves were used to resuscitate banana production in BXW affected areas with the resultant outcome of increased production from obscurity to nearly 80 percent of previous levels in the affected hot spots.

(c) In Maruku Ward, Tanzania, the number of households affected by BXW dropped from 1,815 in 2011 to 950 in March 2013. The community declared that the disease has been controlled to about 80 percent in the ward.

(d) In Cibitoke, Burundi, the average number of bunches sold by farmers was 109/month before the incidence of the BXW. At the peak of BXW attacks, this declined to about 8 bunches/month (representing harvest loss of 92 percent). Recovery interventions showed that farmers currently harvest an average of 37 bunches/months, representing over 72 percent increase from the disease peak levels.

21. The study to validate the effectiveness of TSOL18 vaccine in control of porcine Cysticercosis in DRC, Uganda, Kenya, Tanzania, and Rwanda is steadily ongoing. The vaccine, targeting 1,200 farmers has been received in all these countries. It is anticipated that once fully adopted, farmers will be able to reduce the cost of treating their animals by over US$10 million annually. So far, a total of 842 pigs have been procured, and vaccination commenced.

Natural Resources Management

22. In Kenya’s dryland areas (Wote and Machakos Districts), the introduction of Napier cultivated in pits and forage legumes Clitoria ternatea and Lablab purpureus on 15 farms have enabled farmers to formulate feeding packages combining Napier and the forage legumes. Milk yield has also increased by 51 percent (from 6.9 to 10.4 litres/cow/day). This increased production has resulted into an additional annual income of US$600/cow. Up to 50 households who planted and fed Napier combined with conservation of fodder to ensure feed availability throughout the year increased their milk yield by 2.5 litres/cow/day, resulting into an additional annual income of US$403/animal. Similarly, the establishment of water harvesting facilities and drip irrigation for vegetable production within the targeted Kenyan drylands enabled farmers to generate gross income of up to US$160 from tomato production on small plots (150 m²) within 4 months. Economic analysis indicates that this venture has a potential of generating annual net income of US$5,607/ha.

23. Promotion of sustainable NRM through effective governance and farmer-market linkages encouraged a group of 20 farmers in Bungokho, Uganda to resort to planting improved groundnuts (e.g. red beauty, serenut 2, serenut 3 and serenut 4). Through the use of artificial fertilizers (applied at a rate of 100 kg SSP/ha) and manure, the yields increased from 750 kg/ha in 2009 to the current 1,484 kg/ha for shelled nuts. This led to an increase of gross income generated from US$506/ha (in 2009) to the current US$1,002/ha, leading to a net income of US$437/ha (compared to US$9.3/ha earlier generated without fertilizer). As a result of these
potential economic returns, the farmer groups have dedicated more land to the planting of the groundnuts, and they have also resorted to preparing and selling groundnut paste.

24. In Ethiopia, a total of 22 households in the targeted project area of Adulala harvested 130 kg of honey (worth US$630/month from 10 out of the installed 28 beehives). On the other hand, 720 farmers within the degraded hillside lands targeted for rehabilitation harvested and sold pasture/grass, generating over US$11,000 per season.

25. Farmers in the arid and semi-arid lands have adopted the tumbukiza pits to recover crusted lands; capture rain and surface/run-off water; protect seeds and organic matter against being washed away; concentrate nutrient and water availability at the beginning of the rainy season; and increase yields. Up to 3.2 tons/ha of maize production has been recorded in these pits (compared to >0.5 tons/ha in adjacent fields without tumbukiza pits).

On average, farmers are capable of having 1,730 – 1,850 tumbukiza pits per hectare (each measuring 90cm x 60cm x 60 cm (0.324 m³). So far, there are over 350 farmers with an average of 200 tumbukiza pits on their farms. An assortment of crops can be planted in these pits, including Napier grass, maize, and fruits (mango, orange, pawpaw, and bananas). Each pit carries 6 to 9 plants, thereby producing 50 kg of fresh Napier. Given that Napier productivity ranges from 2.1 – 6.5 tons of dry matter per ha, the targeted farmers harvested (and are capable of harvesting more than) 3 tons of dry matter. In some project sites, some farmers recorded productivity of more than 4 tons/ha during the dry season.

26. Water harvesting technologies has led to increased maize productivity from 1.2 to 3.2 tons/ha in Kenya’s arid and semi lands (ASALs). In Rwanda, a total of 1.26 million litres of water were harvested by the project implementers at farm level, enough to cultivate 3.24 ha of maize to maturity.

27. Most farmers in Kenya embraced tied-ridging, agro-advisories, improved crop varieties, and improved agronomic practices, thereby leading to good yields despite bad season. Maize yields ranged from 1.2 to 3.2 tons/ha compared to baseline yield of less than 500 kg/ha. As a result of this, over 70 percent of farmers are food-secure.

28. ASARECA facilitated the development of the Land Care Ordinance in Bukwo. This is first ordinance to be approved in the 7-year old district. The process employed started with the sensitization of 89 key stakeholders on the need for a District Land Care Ordinance. Following key presentations on the status of the district’s natural resource base, key innovations available and the role of policy, the meeting overwhelmingly raised awareness and support for a land care ordinance. The Business Committee of the District Council convened to develop an Order Paper, and to invite the full District Council (comprising 32 Councilors) to move the motion for formulation of the Bukwo District Land Care Bill for ordinance. Because the majority of the Council had been part of the earlier sensitization process, the motion was seconded and the Bill was assigned to the Production and Natural Resources Committee of the Council for review. This committee revised the draft Bill which was received by the Council Session and tabled as the Bukwo District (Land Care) Bill for Ordinance No.2/2013. Between February and October
2013, the ordinance was made available for public review and comment. In October, the Bill was subjected to a formal review process in the entire district’s sub-counties led by the district technical team. The Bill was then debated by the District and approved as a land care ordinance after the fourth session of Council. The Ordinance paves the way for landscape approach to sustainable land management in the highland district. About 37 percent of the total land area in Bukwo is characterized as severely degraded.

29. Through the application of response farming innovations, up to 500 smallholder farmers in Ethiopia, Kenya and Madagascar who adopted the technologies realized over 50 percent yield increment over and above the normal. The increase in yield is mainly attributed to farmers’ immediate responses to available information on climate provided through downscaled forecasting. The increased yield resulted in households having more food for the family and through sales, increased income.

30. Through the application of Integrated Soil Fertility Management (ISFM) approaches and practices, a total of 600 smallholder farmers in Uganda, Kenya, and Tanzania realized farm level yield increases of between 30-70 percent. This was mainly attributed to the application of fertilizers through microdosing, application of farmyard manure, proper management of crop residues, promotion of fertilizer trees at farm level, and use of improved varieties.

31. Over 1,500 households have adopted water efficient technologies. This was achieved through implementation of water productivity enhancement technologies at selected watersheds in Eritrea, Ethiopia, Kenya, Madagascar, and Rwanda. Up to 5,000 hectares have been covered through construction of appropriate water conservation and management structures within selected watershed. The more preferred technologies included: water terraces, tied ridging, check dams, siltation dams and on-farm tree establishment. These approaches have led to increased amount of water available both at watershed and farm level to support agriculture. In addition, drip irrigation has been promoted across the selected watersheds. Based on these interventions, over 1,000 households who were dependent on food relief became food secure.

32. On the other hand, income-generating activities based on prudent management of soils, water and forests have been initiated in Kenya, Tanzania, Ethiopia, and Uganda through the application of economic incentive-based measures. These activities include: bee keeping, value addition bananas, groundnuts and African Indigenous Vegetables (AIVs). The noted yield increase in these commodities is attributed to the promotion of water efficient technologies, soil fertility management approaches and formation of innovation platforms. It is estimated that approximately 550 households are engaged in these activities with a combined earning of over US$10,000 per year. In addition, over the past two years, 720 farmers in Ethiopia had an annual income of US$9,000 through pasture production from hillside conservation initiatives. Increase in production and income is anticipated.

33. Through the afforestation initiatives, over 570 ha have been brought under tree cover in selected fragile areas, besides planting of over 1 million seedlings in Kenya, Rwanda, and Uganda to ensure soil fertility enhancement, fodder and fuelwood production, as well as for construction and shade.
Capacity Development

34. Through short- and long-term training, a total of 65,000 stakeholders were supported (including over 48 percent of women). The cadre of researchers (masters and PhD) from different countries who have been trained within and outside Africa has contributed to new knowledge and skills pool. For example, on her return to ISABU after receiving her MSc in Plant Breeding, Micheline Inamahoro was appointed Head of the National Biotechnology Laboratory & Screen houses. She has won grants from the Belgian Technical Corporation to collect samples of potato countrywide, besides initiating research activities in the laboratories to come up with disease free coffee varieties and setting up banana experiments in the laboratories. On the other hand, after obtaining his MSc in range management, Manzi Maximillian was appointed the Director of Livestock Research and Extension in Burundi.

Policy Analysis & Advocacy

35. Through the support of ASARECA, a total of 11 standards for cassava (7), potato (4) and related products were harmonized in the East African Region. The standards have been approved by the East African Standards Committee (EASC) and subsequently declared by the East African Council of Ministers for use as East African Standards. In addition, the EASC identified 13 other standards and codes of practice to help in the implementation of the harmonized standards, and to assist the sector in achieving its full potential, e.g. by eliminating technical barriers to trade (TBTs). The standards are to be applied in farm level production, primary processing, factory level processing and trade enhancement in the EAC, thereby ensuring enhanced utilization of cassava and potato products, improving farm level productivity, as well as providing new impetus to intra-regional trade.

Approaches and innovation for scaling up technologies

36. Through the testing of 2 models for farmer-led seed enterprises, namely the private sector-mediated model based on contract farming as well as the Quality Declared Seed (QDS), farmers produced and sold certified seed of various indigenous vegetables, thereby earning annual average incomes of US$3,500/acre. Under QDS model, farmers were able to produce quality seeds with a mean purity and germination rate of 92.3 – 99.0 percent, thus fetching an average selling price of US$71/kg for African eggplant and US$61/Kg of African nightshade.

37. As part of ensuring effective marketing of products, ASARECA supported the development of market linkages for OFSP root and vine producers in Western Kenya. Through collaboration with Farm Concern International (FCI), root producers were linked to traders in Eldoret and Kitale towns. A total of US$ 6,100 was generated. As a result, the Kenya’s Ministry of Special Programmes agreed to improve the OFSP collection centers. On the other hand, other root producers continued to sell their products to Siwonko processors and earned US$3,750. The vine multipliers were also linked to the One-Acre project where they sold vines worth US$7,000. It is worth noting that 125g of OFSP provides children with over twice the recommended daily allowance of Vitamin A.
List of Definitions

Access/Accessibility
In the ASARECA context, access refers to the ease that people have in obtaining relevant products and services, such as technologies, innovations and management practices (TIMPs). In this case, access to TIMPs includes how to get them, where to get them, how to use them, and what impact would be achieved after using them. On the other hand, access to information refers to stakeholders receiving and understanding the disseminated information products as well as delivery pathways.

Similarly, accessibility refers to the extent to which organizational, sectoral and structural arrangements facilitate participation of key stakeholders in the project and program. Participation is based on program strategies, themes and priorities. ASARECA views accessibility through assessing

- Whether key stakeholders know about the available and/or existing TIMP (i.e. by determining the number of farmers having had contact with extension agents in the past quarter;
- If these services and products are physically accessible to them (e.g. by determining the time taken and distance covered to reach these services and products); and
- Whether the stakeholders can afford these services and products.

Agricultural Technology
1. Agricultural technology refers to products, services, techniques, and activities whose use results in increased plant and livestock productivity and higher yield improvements. This definition includes, sustainable agricultural practices, efficient soil and water management, improvements in storage, handling and packaging of agricultural produce, enhanced processing, and other agricultural-related processes. Agricultural technologies can be used individually or in combination.

2. ASARECA broadly categorizes technology under the following themes and sub-themes (see Box 1 for details):
   a) Crop Technologies;
   b) Livestock Technologies; and
   c) Other Types of Technology.

Box 1: Categories of TIMPs

Crop Technologies:
- **Genetic resources** including any material of plant, animal, microbial or other origin containing functional units of heredity, germplasm of plants, animals or other organisms containing useful characters of actual or potential value, and or genetic materials, genes, markers, DNA sequences, breeds of livestock, varieties of crops, collections of crops and their wild relatives.

2. **New varieties** that are distinct, uniform, stable, high-yielding, and resistant to pests, diseases, and drought, and that have the potential of regional adaptability to different environments and growing conditions.

3. **New breeds** that are registered and released. They can be natural from another country, and have a higher genetic value (estimated breeding value (EBV)) in terms of growth rate, or production.
4. **Cropping Systems** refer to the sum total of all of the production practices on a particular field or farm. These may include the types of crops grown, their planting sequence, time, rate and pattern of planting, tillage, nutrient, irrigation, and pest control management strategies. It also refers to a systematic way of growing crops so that they interact with available resources and managerial skills of the practitioner (farmer) for profitable and sustainable crop production in any given environment. Cropping systems include: crop rotation, multiple cropping, mixed cropping, strip intercropping, planting for genetic diversity, etc.

5. **Plant protection** (e.g. IPM), including weed and pest control, agrochemicals.

6. **Crop Management Practices**.

**Livestock Technology:**

1. **Genetic resources** including any material of animal, microbial or other origin containing functional units of heredity, germplasm of animals or other organisms containing useful characters of actual or potential value, and or genetic materials, genes, markers, DNA sequences and breeds of livestock.

2. **Animal husbandry practices**, including activities, tasks, schedules and establishments set up to ensure effective production and efficient productivity of domestic animals and profitable marketing of their products.

3. **Livestock breeding** focusing on maximum returns to the breeder (e.g. semen from progeny-tested sires used for artificial insemination), vaccines, etc.

4. **New breeds** refer to those that are registered and released. They can be natural from another country, and have a higher genetic value (estimated breeding value (EBV)) in terms of growth rate, or production of eggs, meat, or milk.

**Forage and Range Management**

**Other Types of Technology (e.g. Mechanical & Management)**

1. **Farming Systems** refer to "the entire complex of development, management and allocation of resources as well as decisions and activities which, within an operational farm unit or a combination of such units results in agricultural production, and the processing and marketing of the products".

2. **Soil and Water Management Practices** refer to the strategies and mechanisms of ensuring that soil disturbance and loss, through runoff or otherwise is minimized. It also refers to proper water conservation systems within the farmlands and the catchment areas.

3. **Farm Mechanization** refers to the use of tractors, harvesters and equipment for cultivation, planting and feed conservation. Machinery and equipment used for irrigation, livestock production, grain drying and storage, and transport are not included.

4. **Agroforestry** refers to a dynamic, ecologically based, natural resources management system that, through the integration of trees in farms and in the agricultural landscape, diversifies and sustains production for increased social, economic and environmental benefits for land users at all levels (ICRAF 1996). The trees are deliberately grown in association with crops and/or forage or livestock.
5. **Post-harvest Technology** such as handling, cooling, cleaning, sorting, transporting, drying, storing and packaging.

6. **Farm Management** refers to decisions about choice of activity on the farms, e.g. crop grown, use of chemical inputs, labor, animal traction, machinery, etc. It affects the yield of a crop either through soil management (nutrients, water) or through crop husbandry (weeding, crop protection, harvesting, etc.)

7. **Methodologies** (e.g. on-farm demonstrations; field days; radio messages, leaflets, etc.) used to demonstrate the TIMPs with regard to implementation, performance and superiority over alternative technologies.

8. **Gathering practices**, such as methods applied in obtaining animals, insects, fish, fruits and crops from their natural habitats.

9. **Protocols**, including sets of agreed upon and openly published and distributed standards that enable different firms or organizations to manufacture compatible devices/products to the same specifications. All devices made under the same protocol work with one another without any adjustment or modification.

10. **Tools, instruments, implements, utensils and appliances:**
    - **Instruments**, especially small precision tools used by trained professionals – e.g. sterilized scalpel.
    - **Implements** such as rakes, hoes, etc.
    - **Appliances** such as store selling toasters and other appliances.

11. **Laboratory techniques:** This includes the sum of procedures, methods and tests performed in the laboratory and used on natural sciences such as in breeding, transformation, genetics, chemistry, biology, physics and in examination of microbiological, cytological, chemical, and biochemical specimens, normal and pathological experiments in order to conduct an experiment. Techniques may involve the use of complex laboratory equipment such as laboratory glassware and electrical devices.

12. **Equipment.** This may include apparatus, devises, machines, tools, gear, materials, vehicles, outfits, software, etc. needed to undertake or to perform the intended service.

**Demand driven Technologies, Innovations and Management Practices (TIMPs)**

1. The demand-driven technologies, innovations and management practices refer to “what people need”. They are generated to clearly respond to identified agricultural need or priority concern of the stakeholders as well as to the needs of the ECA sub-region. They look at what the consumer and market place “wants”, including attributes related to quality, quantity and variety (as spelled out in the ASARECA’s Program and Unit Strategies and Priorities.

2. These TIMPs are expected to be in line with the expressed needs of the development domains, available tools/methodologies, agricultural enterprises and themes and priority areas demanded by the different levels/categories of stakeholders e.g. breeders, farmers, researchers, professors, etc. They should be generated for specific sites where the need is required. It is noteworthy that there are some demanded technologies that may not easily be demanded by farmers, but are very important intermediaries in generating the
technology/innovations needed by the farmer. These include: drought tolerance genes; markers for genotyping and/or marker assisted breeding; gene manipulation for CBSD or studying the sequence of CBSV.

Innovation

1. An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations … A common feature of an innovation is that it must have been implemented. A new or improved product is implemented when it is introduced on the market. New processes, marketing methods or organizational methods are implemented when they are brought into actual use in the firm’s operations (OECD/Eurostat, 2005).

2. Innovation is the use of knowledge (indigenous and exogenous) in a place or by people in a way that it has not been used before. To qualify as an innovation, it must be replicable at an economical cost and must satisfy a specific need. Innovation involves deliberate application of information, imagination, and initiative in deriving greater or different value from resources, and encompasses all processes by which new ideas are generated and converted into useful products.

New Technologies, Innovations and Management Practices (TIMPs)

1. ASARECA recognizes the main action agents for technology development and dissemination. These include: (i) national research systems, (ii) public extension systems, (iii) universities, especially faculties of agriculture, (iv) farmers and farm households, (v) service institutions such as seed, fertilizer and pesticide distributors, veterinary services, credit agencies, and commodity traders, and (vi) government policy-making bodies for process, marketing, etc. The TIMPs are regarded as new if they have not previously been in use in the target area. Focus is put on the number of TIMPs that are:

   - **Under research/development:** A technology, innovation or management practice can be termed as under research if it has not gone through research phase and made ready for testing before transfer to other people for adoption. It looks at the number of technologies, innovations, management practices and products screened during research phase.

   - **Under field-testing:** These are TIMPs that have gone through screening during research phase and made ready for testing before transfer to other people for adoption. It may involve movement from on-station to on-farm research, through to on-farm verification, demonstrations and pilot production in village projects.

   - **Made available for transfer/uptake:** The TIMPs have been approved by appropriate technical institutions responsible for authorizing its use, tested by farmers on the farms, and are ready for use by the stakeholders. Uptake follows organized field days and visits, and engages research scientists, extension specialists, farmers, seed production specialists, government officials, and representatives from the concerned regional
organizations, and representatives from the universities and development partners. On the other hand, TIMPs made available to uptake are those where:

- Research on the new technology has proven net benefits (e.g. the ex-ante analyses);
- The new technology has been approved by the appropriate technical institutions responsible for authorizing its use;
- Technical extension services are capable of providing extension services pertaining to the new technology (capable here, means having a complete enough understanding of the technical requirements of the technology to be able to impart that knowledge, not the resources required to disseminate the technology); and
- Any policy/policies authorizing the use of the new technology has/have been adopted by the host government. In the realm of agriculture, the measure therefore includes those technologies released by research organizations for uptake by extension services, and by the extension services for uptake by farmers.

**Uptake pathways** refer to channels and processes through which the technologies and innovations reach the intended users. Uptake channels include the private and public extension system, farmer organizations, input distributors, and any other institutional arrangement available through which technology, knowledge and information can reach the end user.
Annex 3. Economic and Financial Analysis

The Impact Evaluation 2014 (IE) carried out an overall assessment of the performance of OP-1 programs based on the findings from the household survey, using a Cost-Benefit analysis approach. This compared the benefits accruing to program beneficiaries with costs of the program.

Estimated program benefits

Program benefits in terms of change in incomes of ASARECA beneficiaries over the program period were estimated using net valuation of agricultural production (see Section 4.4 of IE). This estimated the change in the value of crops and livestock products between 2008 and 2012.

ASARECA project beneficiaries surveyed reported an average increase of US$106 in value of their net agricultural production from 2008 (US$940) to 2012 (US$1047). Over the same period, non-beneficiaries reported a decrease US$166 in net agricultural production value. This gives a net difference of $272 between beneficiary and non-beneficiaries.

Extrapolated across all ASARECA beneficiaries adopting new TIMPs (270,000 households, i.e. 64 percent of stakeholder accessing new TIMPs), this represents a net increase in agricultural production value of US$73.44 million (change in beneficiaries compared to non-beneficiaries). It should be noted that benefits shown are for one year only (2012 compared to 2008).

Benefit-cost estimates

ASARECA OP-1 total program costs were estimated in the region of $90,000,000 (program data).

Comparing the valuation of benefits, US$73.44 million, against estimated program costs indicates that in around 1.25 years the program would have covered operational costs. Thus the benefit-cost ratio would be expected to be positive by the second quarter of 2013. If similar incomes are achieved in 2013, benefits to ASARECA beneficiary households could be expected to exceed costs by US$145 to US$90 (not discounted), by December 2013.

The analysis assumes a constant level of benefits to beneficiaries. While projects surveyed were generally those expected to show impact (the majority containing an up-scaling component), in many cases benefits had only just begun accruing to beneficiaries during the reporting period (2012) and were expected to be higher in 2013. Changing the assumptions would change the project pay-back period and/or benefit-cost ratio. Even with quite large changes in assumptions (i.e. reducing overall benefits by 40 percent), returns to the investment in OP-I look positive in 2014.
Annex 4. Grant Preparation and Implementation Support/Supervision Processes

(a) Task Team members

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<thead>
<tr>
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<th>Title</th>
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</thead>
<tbody>
<tr>
<td>Helmut Albert</td>
<td>Senior Agriculture Economist</td>
<td>AFTA1</td>
</tr>
<tr>
<td>Irene Bomani</td>
<td>Operations Analyst</td>
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</tr>
<tr>
<td>Howard Bariira Centenary</td>
<td>Senior Procurement Specialist</td>
<td>AFTPE</td>
</tr>
<tr>
<td>Nicolette K. DeWitt</td>
<td>Lead Counsel</td>
<td>LEGOP</td>
</tr>
<tr>
<td>Tekola Dejene</td>
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<td>AFTA3</td>
</tr>
<tr>
<td>Tesfaalem Gebreiyesus</td>
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<td>OPSOR</td>
</tr>
<tr>
<td>Malathi Jayawickrama</td>
<td>Senior Operations Officer (ICR Author)</td>
<td>ECSAR</td>
</tr>
<tr>
<td>Jacob Kampen</td>
<td>Consultant</td>
<td>AFTA1</td>
</tr>
<tr>
<td>Paul Kato Kamuchwezi</td>
<td>Financial Management Specialist</td>
<td>AFTME</td>
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<td>Bremala Malli</td>
<td>Senior Operations Officer</td>
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<tr>
<td>Paul Jonathan Martin</td>
<td>Sector Leader</td>
<td>AFTSN</td>
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<tr>
<td>Matthew A. McMahon</td>
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<td>AFTA1</td>
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<tr>
<td>Elizabeth Annet Mutesi</td>
<td>Procurement Analyst</td>
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<td>Luis M. Schwarz</td>
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<tr>
<td>Wendy A. Wiltshire</td>
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(b) Staff Time and Cost

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*Funded by TF092895, except for USD 10 (‘000) in FY09.
Annex 5. Beneficiary Survey Results

The Impact Evaluation (IE, February 2014) assessed the overall quality of the OP-I design and implementation arrangements, and the performance of ASARECA in meeting its Development Objective as stipulated in the OP-1 (2008-2013) and Results Framework. The impact on beneficiaries was the central component of the IE, and involved measuring changes in the well-being of households that can be attributed to a particular project, program or policy. The complete evaluation included qualitative and quantitative methods: desk review; key informant interviews of around 50 project stakeholders (with visits to 7 countries-- Uganda, Tanzania, Kenya, Rwanda, Burundi, Ethiopia and Sudan); focus group discussions with beneficiaries and stakeholders; household survey of project beneficiaries and non-beneficiaries, including 1,072 farmers in four countries (Kenya, Tanzania, Uganda and Rwanda: 25 percent from female-headed households). The IE survey covered information over two years: 2008 and 2012.

Summary of the Impact Evaluation’s Key findings:

Overall Programme Goal: The value of agricultural output has increased for the ECA sub-region over the program period, with three countries exceeding the CAADP agricultural growth target of 6 percent per annum: Rwanda (12.4 percent); Kenya (7.8 percent) and Tanzania (7.8 percent). Ethiopia and Eritrea recorded 5.8 and 5 percent respectively. Average increase in the value of total agricultural output for all ASARECA countries 2008-2012 was 20.5 percent; an increase in real terms of 5.1 percent per annum since the start of OP-1. However, it is not possible determine the specific contribution of ASARECA OP-1 to changes in total agricultural output in the region due to the presence of multiple factors affecting agricultural production, including environmental factors, policy changes and other developmental interventions.

Changes in national average yields of key crops between 2008 and 2012 for ASARECA countries show more variability (from FAO Figures). Average regional yields for maize have increased by 11.6 percent over the period (3 percent per year), with increases of 8.6 percent for rice and 8.4 percent for sweet potato (over 2 percent p.a) and 4.5 percent for beans (dry). However, cassava yields fell in 5 countries with a regional decline in 5.9 percent (mainly due to disease) whilst national yields of green beans fell in Kenya in 2011 resulting in a large average regional decline of 40 percent over the period.

Beneficiaries have achieved increases in yields of key crops of most projects surveyed, especially Quality Protein Maize (QPM), Sorghum-Legume, Bean Innovation (Uganda) and Integrated Water Management (Kenya). However, there are large yield variations between farmers, with a considerable number of beneficiaries not yet seeing increased yields. The nature and sources of variation need to be investigated by projects and addressed in OP-2.

Program Purpose: Stakeholders accessing new Technologies, Innovations and Management Practices (TIMPs) between 2009-2103 are estimated at 422,176, exceeding the target of 265,964.

12 For detailed results and methodology, see, ‘Impact Evaluation of ASARECA Operational Plan 1 and Development Objectives and Documentation of Lessons Learned’, Final Report, Natural Resources Institute, University of Greenwich with Africa Innovations Institute, February 2014.
Based on process monitoring and evaluation by the ASARECA program management units, the percentage of stakeholders adopting TIMPs is estimated at 64 percent (against the target of 74 percent).

Cash incomes of beneficiaries increased notably for half of projects surveyed. This is significant given the short time period since taking up the technologies. Averaged across all projects surveyed, incomes from sales of crops and livestock have increased by an average of $388 per beneficiary between 2008 and 2012. Average incomes for non-beneficiaries fell by $29. These figures indicate that ASARECA project beneficiary households on average have secured sizable increases in cash income over the program period.

Total value of net agricultural output (crops and livestock) has increased in real terms from 2008 to 2012 for beneficiary households surveyed from $940 to $1047: an average of $106. By contrast non-beneficiary households saw an average fall of $166. Extrapolated to all ASARECA program beneficiaries adopting TIMPS (270,000), this measure represents an increase in net crop production value of US$73.4 million. This is a positive finding given the relatively low level of investment in up-scaling technologies under OP-1.

Both the value of agricultural production and cash incomes from crops and livestock have increased over the life of the project for beneficiaries on average. However, incomes from sales of produce have increased more than total production values, indicating that beneficiaries have become more successful in engaging with markets over the project period.

Economic returns to the $90 million investment in ASARECA OP-1 break-even by mid-2013. Assuming 60 percent of projects in ASARECA’s portfolio achieved a similar performance to the projects surveyed, the investment as a whole is expected to be highly positive.

Food and nutrition security is integral to household wellbeing. Eradication of hunger is a central tenet of ASARECA’s mission. The IE used Food availability within the household from any source in 2008 and 2012 as an indicator of household Food Security. Nutrition Security was assessed by Food Groups consumed by household members in the past 24 hours.

Overall, there has been an increase in the proportion of food secure beneficiary households over the program period from 74 percent to 81 percent (IE, Table 14 on p. 41). Over the same period the proportion of food secure non-beneficiaries has increased from 78 to 79 percent. This indicates a positive impact of the projects on food security. However, there were differences in household food security status across countries and projects.

A snapshot of household nutrition intake was assessed by analyzing food consumed by household members over the previous 24 hours in terms of the main food groups: Predominantly Carbohydrates, Protein, Vitamins and Fats (Table 15). This assessment provides a snapshot of household food intake (Note: no baseline food intake or anthropometric measures were available). Overall, 56 percent of beneficiary households were found to consume from all food groups compared to 52 percent of non-beneficiary households, although the difference was not highly significant.
ASARECA has been successful in achieving a high participation rate of women and vulnerable households in projects. There has been less success in securing the participation of youth as direct project beneficiaries. This needs to be addressed through the development of a Youth mainstreaming program strategy for OP-2.

Spillover effects were found to be highly positive for the project sites surveyed. Average pass-on rates to non-project farmers was 7 for each beneficiary household. This needs to be verified through focused Uptake Studies under OP-2.

Level of satisfaction with technologies and innovations is estimated by ASARECA as 71 percent (compared to an 81 percent target). However, the evaluation team found almost 80 percent of the beneficiaries interviewed were satisfied with the benefits from the technologies promoted by ASARECA projects. Benefits to farmers included: increased production, income and food security. Improved nutrition was not a significant benefit.

National governments approved 16 reforms of policies, laws, regulations and procedures to date (against a target of 28). ASARECA, through the Policy Analysis and Advocacy Programme (PAAP) has contributed significantly to harmonization of seed laws and regulations, especially those on seed trade, crop variety releases, product quality standards, exchange of germplasm, and performance trials.

ASARECA has contributed to capacity development of research processes in member countries at various levels. 150 students (96 men and 54 women) have benefited from long-term training including Masters and PhDs. This has increased the capacity of the National Agricultural Research Systems (NARS), making a significant difference to the weaker NARS and to key areas of other NARS. However, continuing support for recent post-graduates is recommended, particularly for the weaker NARS to close the gap across the region.
Annex 6. Stakeholder Workshop Report and Results

Not applicable
Annex 7. Summary of Grantee's ICR and/or Comments on Draft ICR

The ASARECA Secretariat’s comments on the ICR are as follows:

We have gone through the implementation completion report and found it to be very well written and very good. Four of us (Enock, Patrick, Francis and myself) went through and found that it gives a very good representation of ASARECA OP1 supported under MDTF.

We have only made a suggestion to change paragraph 92 as indicated on page 21; and some editorial in paragraph 80.

The rest are minor editorial changes that are given in track changes for paragraph 50, 66, 83, 89 and 96.

With Warm Regards

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Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders

Not Applicable
Annex 9. List of Supporting Documents

World Bank/Development Partner Documents
Aide Memoires of Implementation Support Missions, 2008 to 2014.


Grant Agreement, Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) Multi-Donor Trust Fund Grant TF093070.

Implementation Status and Results (ISR) Reports, 2008 to 2014.


Other Documents

CAADP Pillar IV Multi-Donor Trust Fund for ASARECA, November 26, 2008 (used as the Project Appraisal Document for the MDTF).


Impact Evaluation of ASARECA Operational Plan 1 and Development Objectives and Documentation of Lessons Learned, Final Report, Natural Resources Institute, University of Greenwich with Africa Innovations Institute.

Annex 10. MAP