



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

## Education and Research in Agriculture (ERA)

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# Annual Report

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## List of Abbreviations

<b>AETR</b>	Agricultural Education, Training and Research Institution
<b>AGRA</b>	Alliance for a Green Revolution in Africa
<b>ANAQ-Sup</b>	<i>Autorité Nationale d'Assurance Qualité de l'Enseignement Supérieur</i>
<b>ANCAR</b>	<i>Agence Nationale de Conseil Agricole et Rural</i>
<b>APROVAL</b>	<i>Association des Professionnels de l'Alimentation pour la Valorisation des Produits Locaux</i>
<b>BAME</b>	<i>Bureau d'Analyse Macro-économique</i>
<b>CA</b>	Conservation agriculture
<b>CBSP</b>	Community-based Service Provider
<b>CERAAS</b>	<i>Centre d'Etudes Régional pour l'Amélioration de l'Adaptation à la Sécheresse</i>
<b>CFPH</b>	<i>Centre de Formation Professionnelle en Horticulture</i>
<b>CNFTEIA</b>	<i>Centre National de Formation des Techniciens d'Elevage et des Industries Animales</i>
<b>CNFTEFCPN</b>	<i>Centre National de Formation des Techniciens des Eaux et Forêts, Chasse et des Parcs Nationaux</i>
<b>CONGAD</b>	<i>Conseil des ONG d'Appui au Développement</i>
<b>CRCR</b>	<i>Cadre Régional de Concertation des Ruraux</i>
<b>CROP</b>	Collaborative Research and Outreach Partnership
<b>DRDR</b>	<i>Direction Régional de Développement Rurale</i>
<b>ENSA</b>	<i>Ecole Nationale Supérieure d'Agriculture</i>
<b>ERA</b>	Education and Research in Agriculture
<b>ESEA</b>	<i>Ecole Supérieure d'Economie Appliquée</i>
<b>FDI</b>	Faculty Development Initiative
<b>FEPRODES</b>	<i>Fédération des Groupements et Association des Femmes Productrices de La Région de Saint Louis</i>
<b>FIARA</b>	<i>Foire internationale d'agriculture et de ressources animales</i>
<b>FNRAA</b>	<i>Fonds National de Recherche Agricole et Agro-Alimentaire</i>
<b>FOAD</b>	<i>Formation Ouverte à Distance</i>
<b>FTF</b>	Feed the Future (presidential food security initiative)
<b>FTFMS</b>	Feed the Future Monitoring System
<b>FY</b>	Fiscal year
<b>GIE</b>	<i>Groupement d'intérêt économique</i>
<b>GRAAS</b>	<i>Groupe de Réflexion sur l'Agriculture et l'Agro-alimentaire au Sénégal</i>
<b>HACCP</b>	Hazard Analysis and Critical Control Points
<b>IPM</b>	Integrated pest management
<b>IRD</b>	International Relief and Development
<b>ISFAR</b>	<i>Institut Supérieur de Formation Agricole et Rurale</i>

<b>ISRA</b>	<i>Institut Sénégalais pour la Recherche Agricole</i>
<b>ITA</b>	<i>Institut de Technologie Alimentaire</i>
<b>LS</b>	<i>Ligne spécialisée</i>
<b>LTAEB</b>	<i>Lycée Technique Agricole Emile Badiane</i>
<b>MEDD</b>	<i>Ministère de l'Environnement et du Développement Durable</i>
<b>MESR</b>	<i>Ministère de l'Enseignement Supérieur et de la Recherche</i>
<b>OIRED</b>	Office of International Research, Education, and Development (Virginia Tech)
<b>PCE</b>	<i>Projet de Croissance Economique</i>
<b>PI</b>	Principal Investigator
<b>PMP</b>	Performance Monitoring Plan
<b>PMU</b>	Project Management Unit (Dakar project office)
<b>PPP</b>	Public-Private Partnership
<b>POPAS</b>	<i>Plateforme des Organisations Professionnelles de l'Agroalimentaire du Sénégal</i>
<b>PRECAS</b>	<i>Programme de Relance et d'Accélération de la Cadence de l'Agriculture Sénégalais</i>
<b>Q1, Q2</b>	1st quarter, 2 <sup>nd</sup> quarter, etc.
<b>SAED</b>	<i>Société Nationale d'Aménagement et d'Exploitation des Terres du Delta du Fleuve Sénégal et des Vallées du Fleuve et de la Falémé</i>
<b>SNRER</b>	<i>Réseau National pour l'Enseignement Supérieur et la Recherche du Sénégal</i>
<b>SWOT</b>	Strengths, weaknesses, opportunities, and threats
<b>TU</b>	Tuskegee University
<b>UASZ</b>	<i>Université Assane Seck de Ziguinchor</i>
<b>UC</b>	University of Connecticut
<b>UCAD</b>	<i>Université Cheikh Anta Diop de Dakar</i>
<b>UGB</b>	<i>Université Gaston Berger</i>
<b>USAID</b>	United States Agency for International Development
<b>USDA</b>	United States Department of Agriculture
<b>USSEIN</b>	<i>Université du Sine Saloum El-Hadji Ibrahima Niassé (formerly USSK)</i>
<b>USSK</b>	<i>Université du Sine Saloum à Kaolack</i>
<b>UT</b>	<i>Université de Thies</i>
<b>UVS</b>	<i>Université Virtuelle Sénégalaise</i>
<b>VT</b>	Virginia Tech

## Executive Summary

Agriculture in Senegal is changing, with the support of innovations from Feed the Future and other USAID projects. Senegal's agricultural education, training, research, and extension system must also change in order to provide relevant, high-quality, local leadership for these agricultural innovations. To that end, USAID/ERA continues to work to develop human and institutional capacity in agricultural education, training, and research (AETR) institutions. In Year 5, the project was extremely active, producing a variety of results.

In the domain of **Component 1, “Strengthening Agricultural Education and Training,”** the project organized a nationwide e-learning symposium with the MESR, involving over 130 participants, and a nationwide symposium on innovative pedagogy, reaching over 90 teacher and student participants from eight AETRs, plus two U.S. consortium partners. Topics covered in the symposium and in related workshops include: syllabus development, assessment of student learning, seed curriculum development, service learning, and distance learning. To expand and deepen work in this area, the symposium was accompanied by training and mentoring on syllabus development processes at four new AETRs, bringing the total to ten AETRs, with over 122 faculty involved and over 60 syllabi created. In similar fashion, USAID/ERA's partnership-building and capacity-building approach produced important contributions towards strengthening AETR capacity for seed production. Specifically, the project led the participatory development and validation (including development and use of a PPP) of two degree programs (a Bachelors at UT and Masters at UCAD), along with a multisession training of 22 certified seed technicians, who then trained hundreds of producers.

Faculty workshops were successfully held on: measuring economic impact of development projects (23 participants from 10 AETRs); teaching entrepreneurship and business planning (22 participants from 10 AETRs); conducting tracer studies to evaluate the employment and higher education outcomes of graduates (15 participants from 5 AETRs); and the establishment of student placement services offices. Exchange visits were facilitated to broaden student horizons and establish student services best practices, including partner representative participation in international exchange, training, and professional conference visits—a UGB professor at the Agricultural Extension & Food Security in Africa Conference, Ohio State; ANAQ-Sup & MESR personnel at the Council for Higher Education Accreditation (CHEA) Annual Meeting and Conference, Washington; UCAS, UT-ENSA, & ISRA professors at the Corn and Sorghum Seed Research Conference, Chicago; and UASZ professors at the African Cashew Initiative Master Training program in multiple African locations.

In an innovative adaptation of a U.S. higher education approach, USAID/ERA launched the Common Book activity: *L'Agriculture Sénégalaise de 1958 à 2012*, by our partner Amadou Ndiaye, was distributed to over 280 students and mentors were trained to guide student reading groups, designed to foster critical thinking and reflection about agriculture outside of the

classroom. In the area of experiential learning support, a silage chopper prototype was completed as model for a student-led competition that will take place in Year 6. Partner institution library staff participated in trainings on library management software and other ICT tools. Many partners participated in workshops on AETR self-assessment, quality assurance, and strategic planning (described in greater detail in relation to Component 3, below). Also, a gender assessments of training programs of the Ministry of the Environment and Sustainable Development was facilitated.

Finally, 5 of 19 scholars completed their Masters in the U.S., with 13 to graduate in May 2016. One will continue as PhD student, while one won a U.S. award for research and one has a new job in Senegal. Most of the 152 locally supported scholars have completed their studies (18 have left the program due to family programs).

As pertains to **Component 2, “Strengthening Applied Research and Outreach,”** a key accomplishment was the implementation of a symposium on collaborative research and technology transfer for participants in the agricultural economy. Also, Senegalese graduate students and faculty members, with other partners (including FTF/USAID) continued ongoing multi-institutional, interdisciplinary applied research with promising results:

- “Intensification & sustainable management of millet production in areas of Thies, Louga and Nioro: Improving, expanding and strengthening the value chain of superior varieties” (*9 varieties added, including 4 elite varieties, 300 producers trained by ANCAR, 3.4T seed produced*)
- “Production & processing of sweet corn in Senegal” (*field day with over 100 participants from many partners, ITA canning tests, documentary film*)
- “Sustainable improvement of cereal productivity in salty environments” (*positive results for Sosat millet, soil amendments tested, 50 producers trained by ANCAR*)
- “Improving the productivity of rainfed rice in Casamance” (*4T of seed for 4 rice systems, village demonstrations of NERICA varieties, 5 ANCAR technicians and 120 producers trained, 5 exchange visits*)
- “Promotion of local rice in the valley and delta of the Senegal River” (*variety testing and seed multiplication, socioeconomic surveys, data on rice milling scale, growers’ associations and GIEs approved as certified seed producers*)
- “Fortified instant cereal-based products for the Senegalese market” (*enriching with local fruits, including student and faculty research in U.S.*)
- “Conservation agriculture using legumes in millet systems” (*successful intercropping of mung bean with millet for the soudure period*)

Similarly, successful PPPs for agro-alimentary development were developed and strengthened. The UCAD and POPAS partnership involving over 43 participants united professors, researchers, 15 student interns, and women’s economic empowerment groups in a training and development



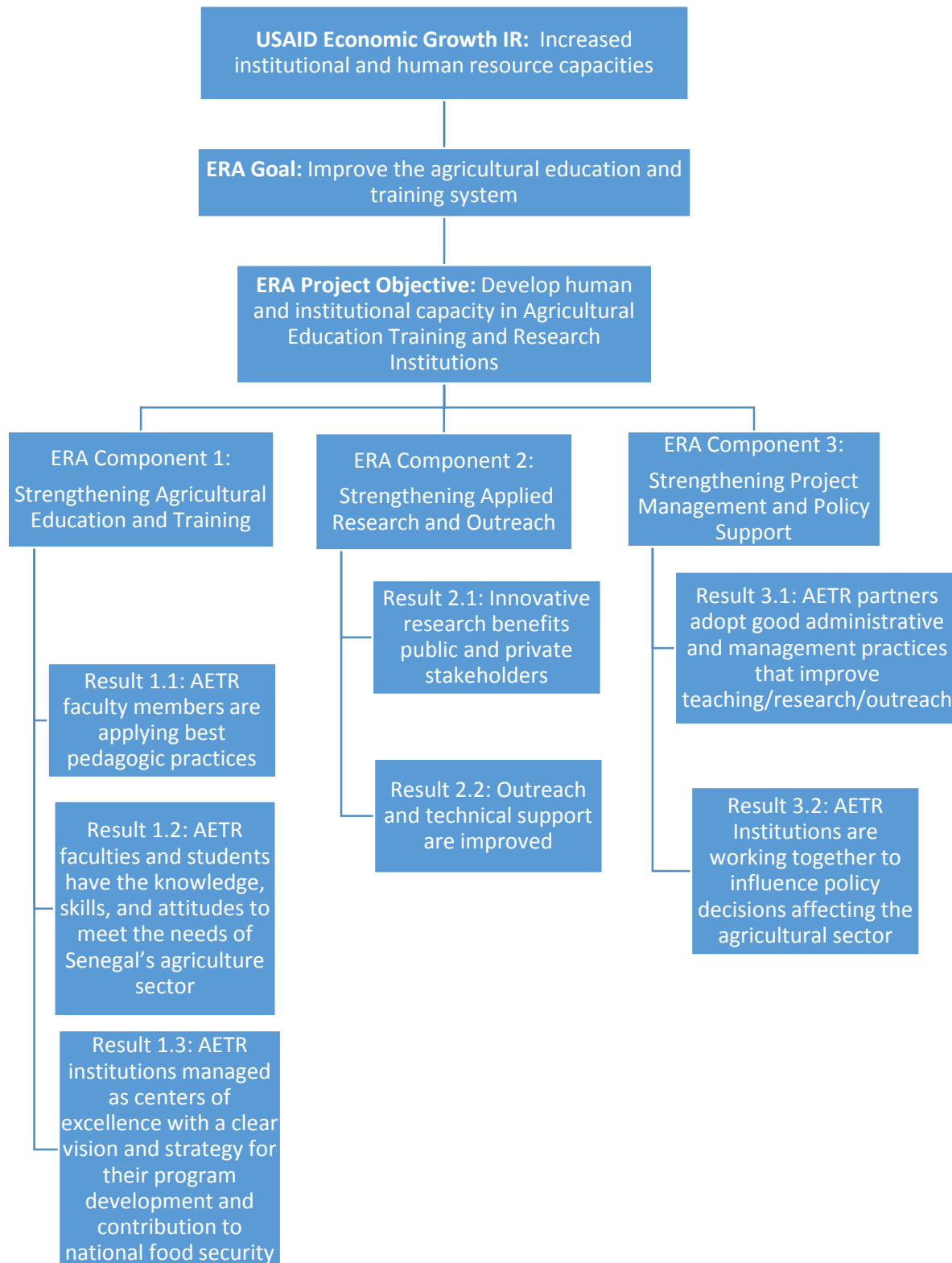
partnership focused on packaging and nutrition, establishing nutritional tables, hygiene and traceability, marketing and commercialization, bar codes and packaging, consumer taste-testing, establishment of hazards analysis and critical control points (HACCP) for 12 SMES. This led to the establishment of the necessary documentation (the FRA) for the products to be sold widely, with GIE products now available at the UCAD cafeteria.

In addition to village-to-village outreach, a major outcome in Year 5 was the establishment of pilot 4-H Senegal Positive Youth Development programs in agriculture and entrepreneurship for sustainable community development. A series of trainings and follow-up visits led to three pilot clubs in the area of Toubacouta reaching over 100 youth. This was made possible by the collaboration with 4-H experts from Virginia Cooperative Extension, a close collaboration with Peace Corps (including the provision of a 3rd year volunteer), the involvement of faculty (from ISFAR & ENSA) and ANCAR agents, and the commitment of highly skilled volunteer grassroots youth workers. Efforts are underway to secure official recognition from 4-H U.S. in Washington.

Finally, in the domain of **Component 3, “Strengthening Project Management and Policy Support,”** USAID/ERA was pleased to see the passage of a new law governing universities (*Loi n°18/2014*), with addition of outreach as a university mission (*service à la communauté*). The Minister of Higher Education and Research has publically remarked that USAID/ERA was influential in shaping the form and direction of this legislation. Likewise, the project has had significant successes through its partnership with ANAQ-Sup on Quality Assurance and institutional strategic planning. Specific results include the harmonization of the self-assessment tools now widely used by agricultural degree programs seeking national certification, the implementation of technical training workshops at UCAD, UGB, UASZ, ENSA and ISFAR, and completion of strategic plans by ISFAR, LTAEB and CFPH.

In support of the operationalization of the new law, USAID/ERA continues the facilitation of GRAAS (the *Groupe de Réflexion sur l’Agriculture et l’Agro-alimentaire au Sénégal*). The project continues to build partner capacity by supporting their activities through capacitating sub-awards (FOGs), by promoting Ministerial performance contracts (with CNFTEIA as a pilot), by facilitating technical working groups, and by supporting partner participation and inter-institutional cooperation and visibility at the FIARA (*Foire Internationale de l’Agriculture et des Ressources Animales*).

## USAID/ERA Results Framework



## Component I: Strengthening Agricultural Education and Training

ERA targets three results under this component: (1) Improved teaching practices; (2) Increased knowledge, skills, and attitudes of students and faculty; and (3) Improved management of AETR institutions as centers of excellence.

### Result 1.1: AETR faculty members are applying best pedagogic practices

#### Annual Achievements

USAID/ERA supported the strengthening of syllabus development and best practices of teachings during three years in six AETRs (ENSA, ISFAR, UASZ, LTAEB, CNFTEFCPN, and CFPH). In the Year 5, the focus on best pedagogic practices was on sharing and multiplying USAID/ERA efforts in this field by organizing a pedagogic symposium in March. The main recommendation was to scale up this activity in four new AETRs (CNFTEIA, UCAD, UGB, and ITA). The innovative approach was to identify in each AETR the people or services in charge of teachers capacity building. Furthermore, the AETRs which are more experienced in syllabus development collaborate with the other non-experienced AETRs. In this way, ERA supported 122 faculty members' participation in workshops and mentoring activities on how to better develop course syllabi and around 61 new syllabi are elaborated by UCAD alone. This multiplication effort will be continued during year six.

During year 5, in collaboration with Senegal's e-learning experts from public and private institutions (UGB, UCAD, UASZ, UT, IFD, UVS, Orange, and CONTAN), ERA organized a symposium to promote distance learning. More than 130 participants shared on strategies, best practices and solutions for online teaching and training in Senegal. During this meeting, the main recommendation was to create a distance learning network to share best practices and harmonize actions.

In order to promote sharing of knowledge and experiences among teachers, the project is using InnovATE's online Community of Practice tool to enhance communication between faculties' members on course subjects as well as broader aspects of agricultural education. Three Communities of Practices (CoP) have been created for online discussions and experience sharing: on the Common Book program, on curriculum content and pedagogy, and on e-learning development.

Support was also provided to faculty members to participate in national and international events related to food security, such as agricultural research conferences and meetings.

- Participation at the Ohio State University conference on “Agricultural Extension & Food Security in Africa” by Dr. Amadou Ndiaye, Professor at UGB; He presented an article on “Curricula and agricultural training in Senegal: Extension worker's skills and needs in agricultural risk management.”

- Participation at the Council for Higher Education Accreditation (CHEA) Annual Meeting and Conference at Washington by Dr. Papa Gueye and Abdou Lahate Cisse from ANAQ-Sup (National Quality Assurance Authority for Higher Education) and Professor Babacar Gueye from the Ministry of Higher Education and Research. The objective of ANAQ-Sup and Senegalese Ministry participation in the CHEA Annual Meeting and Conference is to reinforce linkages between quality assurance and University accreditation personnel from Senegal, the US and other international bodies.
- Participation at the CSS 2014 (Corn and Sorghum Seed Research Conference) and Seed Expo at Chicago by three partners: Professor Samba Sylla (UCAD), Dr. Tala Gueye (UT-ENSA), and Dr. Mamadou Lo (ISRA).
- Participation of Dr. Daouda Ngom and Mohamed Charahabil at the Master training program on Cashew Value Chain Promotion organized by the African Cashew initiative: Two sessions have already been organized with the last one scheduled for November 2016.

The USAID/ERA project has initiated during this fiscal year a new program titled “Book of the year,” or Common Book, to support its training institutions partners to implement a new pedagogical approach in order to stimulate the students’ critical thinking and build a sense of community among them. The chosen book *L’Agriculture Sénégalaise de 1958 à 2012* was distributed at each training institution and the activity was managed by a committee of 2 or 3 members in charge to encourage discussion among students. This approach helped to strengthen the networks of first year students in two institutions (LTAEB and CNFTEFCPN) which have already finalized this activity during this FY15. Animation sessions were organized in their two institutions with the presence of the author who answered the students' questions and shared their understanding of his book. This activity will be continued in seven (7) institutions partners during this FY2016 with pedagogical animation with students.

The project is in the process of strengthening instructional techniques focusing on student-centered teaching and learning methods. A second phase of the pilot experiential learning activity based on agricultural mechanization (silage production) was carried out with ISFAR and ENSA faculty members and students. Experiential learning takes students out of the classroom into a world that is far more complex and interconnected, thus, challenging their global perspective and ability to take responsibility for their own learning. A prototype chopper for ensiling vegetation for animal feed was built by Virginia Tech’s Mechanical Engineering team based on local community needs and tested with Toubacouta farmers’ community. The activity includes exchanges between Senegalese students and villagers, and between Senegalese students and peers in the capstone design class at Virginia Tech.

Students from the three partner institutions have undertaken a joint excursion to test a prototype chopper for ensiling vegetation for animal feed. The exchange between students from different institutions was highly productive. Students, local artisans, faculty and farmers shared experiences

that potentially lead to improved agricultural outputs. A final silage system design (after addressing the problems from the demonstration) is now completed and will be presented to ENSA/ISFAR teams. This year, they will organize the contest with local artisans for building test models between silage choppers to be evaluated by Toubacouta farmers.

#### 4th Quarter Highlights

- Teaching best practices multiplication by trainings (CNFTEIA, UCAD)

### **Result 1.2: AETR faculties and students have the knowledge, skills, and attitudes to meet the needs of Senegal's agriculture sector**

#### Annual Achievements

Five ERA Scholars among the nineteen have completed their graduate degrees in the United States and returned in Senegal. Thirteen will be done by May 2016 and one will continue for a PhD program. Most of the local scholars who ERA has supported at Senegalese institutions have finished their studies. As a contribution to human resources development of existing faculty members, ERA has supported three ISFAR faculty members who are currently enrolled at local institutions in graduate work related the professional responsibilities they fulfill at their institutions.

In term of short term training, in collaboration with the University of Connecticut, the project has enhanced the capacity of a group of 23 faculty members (ENSA, ISFAR, UGB, CNFTEIA, UASZ, LTAEB, CFPH, ISRA, ITA, UT) on key conceptual and practical issues associated with the quantification of the impact of agricultural development projects. Also in partnership with Tuskegee University, faculty members were reinforced on Entrepreneurship and Business planning; this training strengthened the capacities of 22 teachers (ENSA, UGB, ISFAR, CNFTEIA, UASZ, LTAEB, ITA, CFPH, CNFTEFCPN and UCAD) by improving the quality of teaching in entrepreneurship, agribusiness and the development of business plans using software. The ENSA Master Value Chain program was also supported by the project with the organization of a workshop on evaluation and validation of the training program (curriculum).

During Year 4, ERA initiated the implementation of a new program called “Public-private Partnerships for the Development of Training Programs on the Seed Sector.” Two major objectives were defined. The first objective was to work on a jointly implemented certificate program in certified seed production. The second is the integration of certain aspects of the seed value chain into curricula for AETR partners in Senegal. During Year 5, the inter-institutional standing committee on curriculum development achieved the two expected seed curricula which were submitted to an academic and external validations by the faculties and the stakeholders (public and private sectors, producers). Two AETR (UT, UCAD) are ready to implement the pilot phase (with a new Master's degree and Bachelor's degree, respectively).

For the second objective, ERA in collaboration with private and public seed sectors, completed a three-part (composed of theoretical, laboratory and field activities) seed technician training program. The goal of the three part seed training program was to improve food security through training of 22 agricultural technicians that would provide wide range of services (from crop variety selection to seed marketing) to the farmers. The next stage is to support seed curricula implementation and the multiplication of seed technicians training.

#### 4th Quarter Highlights

- Participatory development, based on nationally and locally expressed needs, of one non-degree training program and two degree programs (one Bachelors, one Masters) to help ameliorate the whole system of education, training, research, and outreach for improved and certified seed of Senegalese staple crops.

### **Result 1.3 AETR institutions managed as centers of excellence**

#### **Annual Achievements**

In an effort to strengthen partner AETR institutions to improve their management system, services and teaching programs, the project has continued to support institutional self-assessment and quality assurance. External validation workshops were held to share results from CFPH and UASZ self-assessment. ISFAR has done a strategic planning document and CFPH has begun this new phase with the support of the project. Two universities (UGB and UCAD) have initiated an institutional self-assessment process.

In partnership with ANAQ-SUP, training workshops were organized on the methodology and process for the evaluation of training programs. UCAD, ENSA and ISFAR have training programs reviewed by ANAQ for accreditation. A key success from this partnership was the harmonization of tools and methodologies of how to evaluate and assure the quality of agricultural higher education and training programs. Through this harmonization and the institutional credibility lent by ANAQ-SUP's close partnership with ERA, partner institutions have engaged very well in this self-evaluation and quality assurance program.

In its goal to support the institutions to improve the delivery of services to students and facilitate their integration in professional environment, USAID/ERA has encouraged, since 2014, each institution to put in place a student support and counseling center for a better employability of the new graduates. Two training workshops and two exchange visits were organized to empower institutions in this field. This resulted in the development of an operational guidebook for planning and developing career services for students and graduates. The guidebook will be shared within each institution for validation and a national workshop will be held for its adoption. Ten (10) institutions partners took part in the all process.

Tracer studies allow the follow up on students and their employers over a period of several years; they are a highly valued tool. USAID/ERA organized a training workshop for five (5) institutions in how to conduct tracer studies of employment/education outcomes of graduates. This year, each of the 5 selected institutions will be implementing a pilot tracer study and a workshop will be hold to review and share their results.

A series of training workshops were organized for institutions Librarians in many topics such as library management and Library digitalization. One training workshop will be organized this year for Librarians to end up this series.

#### 4th Quarter Highlights

- External stakeholders validated the university level curriculum in seed science and technology (for 58 participants; in Dakar). For press coverage on this outcome, click [here](#) or [here](#).
- Twenty-two seed actors were trained in seed production, control and storage (in Kaolack and Niore). For press coverage on this outcome, click [here](#).
- Workshop for AETR institutions for co-constructing an operational guidebook for planning and developing career services for students and graduates involving participation by: ENSA, ISFAR, UT, CFPH, UASZ, LTAEB, CNFTEFCPN, UGB, and CNFTEIA.

#### Component I Impacts

- Syllabi are still considered a norm by faculty members and students at all AETR. In Year 6, ERA will expand the syllabus project to four additional partners (UGB, UCAD, ITA, and CNFTEIA).
- Two seed curricula are ready to be implemented in two AETR (UT, UCAD).
- Twenty-two seed actors completed their short term training in seed production, control and storage, who in turn used their new knowledge to train hundreds of producers.
- Institutions are aware of the necessity to develop career services for students and graduates.
- A co-constructed operational guidebook on student placement and internship services is ready to be validated and adopted by actors. It will contribute to the implementation of one of the new missions of Senegalese universities: support the professional insertion of their graduates.
- Three institutional partners have completed and submitted their Ministerial performance contract (LTAEB, CNFTEFCPN, and ISFAR).

#### Constraints encountered and unresolved issues

Ideally, experiential learning is a normal part of formal classes. In the case of pilot implementation at ENSA and ISFAR in Year 5, experiential learning will be done through extra-curricular field trips. It will take time for instructors to incorporate experiential learning into existing classes or develop new classes using this model.

The graduate students in the United States are all making appropriate process. However, many of the students required more time than the project management anticipated meeting the language requirements for graduate school. Although some of them will graduate by October 2015, most of them cannot graduate until May or August of 2016. The late rains in 2015 had deleterious consequences on numerous field experiments. All of the graduate research on field crops needs to be repeated in 2015.

Most of the 152 Senegalese students who were awarded two years of academic support have or will have finished their degrees by the end of the current academic year. However, student and faculty strikes in 2014 resulted in delayed starts at several institutions and caused difficulties for some students to enroll. Proof of enrollment is a criterion for receiving the scholarships. At the end of Q1, there were 18 students whose special cases leave them unable to claim the remainder of their scholarship until they can enroll.

A training for institutional librarians scheduled for the end of March had to be postponed because some librarians had been given responsibilities for their respective institution's participation in ERA's display at the national agricultural fair (FIARA). The frequency of requests for faculty participation in ERA events and planning meetings for these vents probably caused difficulty for some individuals. A faculty strike at all of ERA's partner universities reduced participation in some activities and the cancelation or postponement of others.



## Component 2: Strengthening Applied Research and Outreach

ERA targets two results under this component: (1) Public and private stakeholders benefit from innovative research conducted by AETR institutions; and (2) Outreach and technical support are improved. Each of the first five activities represent separate Collaborative Research and Outreach Partnerships (CROPs) that were funded as three-year sub-awards to a lead Senegalese institution through a call for proposals requiring inter-institutional collaboration.

### Result 2.1: Innovative research is benefiting public and private stakeholders

#### Annual Achievements

At the beginning of the year 5, in November, the Research Coordinator Demba Farba Mbaye and Tom Thomson from VT reviewed the achievements of the CROPs, but many results from the 2014 research season were available only after the January 2015 ERA research symposium.

Most research projects were at a lull during the dry season. Work focused on analysis of results from the 2014 growing season and their presentation at the research symposium. The three-day symposium in January showcased the results of Senegalese research teams and the research of graduate students supported by the project. The theme was “Collaborative research and technology transfer for participants in the agricultural economy.” The objective of the symposium was to share results of ERA research with producers, extension agencies/projects, and other stakeholders, as well as provide peer input before a final season of research. The symposium was opened by Minister of Higher Education and Research, Mary Teuw Niane who used the occasion to credit ERA for several elements in the new law governing universities. The symposium featured twenty-six research presentations plus twelve presentations from producers and other private sector actors.

Three working groups on the following themes synthesized the results of the research presentations and subsequent discussion to make recommendations on priorities for ERA’s research component and Senegal’s research establishment: (1) quality seed and good agricultural practice; (2) post-harvest technologies and food processing; (3) diffusion and adoption of research results (knowledge, technologies, equipment, and organization). Details of research results from the symposium are mentioned in the symposium proceedings.

#### *Intensification and Sustainable Management of millet production in areas of Thies, Louga and Nioro: Improving, expanding and strengthening the value chain of superior varieties*

In addition of the results shown at the research symposium, the main results obtained at the end of this year are:

- ENSA added nine varieties to the germplasm collection. Graduate student, Mamadou Ndoeye did microsatellite diversity analysis of these new acquisitions as part of his Master’s thesis at ENSA.
- ANCAR carried out training on good agricultural practice 300 producers through the end of the millet harvest. 3.4T of foundation millet seed were produced and conditioned.

- Ms. Mame Codou Gueye and Dr. Khalil Kane from ISRA-CERAAS carried out research at Virginia Tech in January and February to measure physiological and biochemical characteristics of pearl millet varieties grown under controlled conditions subjected to water stress. After their trip, they established a trial of 4 elite millet varieties in the field at ISRA / Bambey research station to confirm their drought tolerance potential identified in the laboratory.
- Mrs. Fatou Tine, student from VT, USA, working in Mame Codou Guèye's (CERAAS) program, came to Senegal from 24<sup>th</sup> May to 19<sup>th</sup> August for data collection for her Ms. Thesis at Bambey/CERAAS.
- The team organized meetings for planning the activities for the rainy campaign and the PI (Dr Saliou Ndiaye), attended the final planning session with the others PI at the PMU office.

### *Production and Processing of Sweet Corn in Senegal*

The results obtained by this CROP in this year were presented at the January research symposium. The additional activities led from this date to the end of the fiscal year 5 can be resumed as above:

- Agronomic tests on the optimal use of fertilizers and density at Nioro, Sangalkam, and Ndiol, by ISRA researcher, Ms. Fatou Diop Mbacké, during the offseason, under irrigation regime. Graduate student Marième Dramé worked with ISRA to implement field tests on the optimal use of fertilizers at Ndiol and Sangalkam. Graduate student Fatou Diop completed agronomic tests on optimal density, nutrition, in Nioro, Sangalkam, and Ndiol.
- UCAD researcher Mady Cisse carried out biochemical tests on sweet corn varieties that will lead to recommendations for the best varieties for canning.
- CFPH organized two field visits on the sweet corn collaborative research sites: One took place at Sangalkam research station for 60 people during the first quarter. Producers and industry players were invited to give their appreciation on the five sweet corn varieties being tested there. The second field day took place during August 15, in which 41 persons from the implementing institutions (ITA CFPH, ISRA / CDH, UCAD / ESP), USAID / ERA, producer organizations (Paoskto, Dagger Seko, Keur Mari, Keur Nderi Ndiaye, Diamaguène, Nioro, and Keur Mamoudou Nderi), support and consultancy services (Ancar, SDDR, ASPRODEB, Symbiosis NGOs, CPA, Caritas) and two (2) local newspapers participated and gave good appreciation for the done work. Data collection sheets for the development of technical data sheets and training modules were made. Data collection is being carried out in the ISRA test plots.
- ITA carried out the determination of manufacturing method of canned sweet corn using different methods for different phases of the process (preparing and conditioning sweet corn; heat treatment; microbiological analyzes: microbiological quality control during the manufacturing and stability tests; biochemical analyzes) and the best practices to obtain safe and quality canned sweet corn were determined. However, it is necessary to work more on the determination of the sterilization time to complete this manufacturing process.

The collection of data to develop a documentary film on sweet corn in Senegal has started and will be completed with the data from the ongoing activities

### *Sustainable Improvement of Cereal Productivity in Salty Environments (ISFAR)*

The project's annual report (2014, January 1<sup>st</sup> –December 31<sup>st</sup>) documented all eleven activities that were planned had been achieved or undertaken in 2014 among which were:

- Tests of organic soil amendments for millet and rice production
- Analysis of the physical properties of dough comprising wheat flour mixed with 15% millet flour
- Training three master's students at ISE, ENSA, and VT)
- Training producers on good practice in production (seedling production, mechanical and manual land cultivation)
- Vegetative protection of earthen micro-dikes.

ISFAR carried out research on techniques to reclaim salinized rice fields for millet and rice production in the villages of Fadial and Ndoff (Department of Fatick)—since salinization of soil is often attributed to climate change, this research endeavor is one of the ways in which ERA is responding to climate change pressure. Millet planting was successful but suffered some animal damage. Late and insufficient rain prevented rice from producing. The team experimented with mini-water retention dikes and planted three different plant varieties at an experimental site in order to fix the soil in place.

Sosat was determined to be the best millet variety for salt tolerance. It was preferred by producers because of its short-cycle, and also the preferred variety during village cooking demonstrations as it has a smaller proportion of bran than other varieties as well as a pleasing color and grain size.

The project received three Senegalese students enrolled in Masters programs including one from the University of Thies and two from the University of Dakar. The University of Thies student worked on the “Effects of organic amendments on salinity and productivity of three varieties of millet at Ndof village.” One UCAD student is working on the “Effects of biomechanical management on the salinity and productivity of millet at Fadial and Ndof villages.” Another student from UCAD is working on the “Effects of the biomechanical management on the salinity and productivity of rice at Fadial and Ndof villages.” Meanwhile, the project received graduate students Sekouna Diatta and André Diatta, two Senegalese students, training at Virginia Tech for their Masters degrees, in the Ndof village. Their research focuses on (1) the effects of peanut hull and filao compost on salinity and productivity of millet at Ndof, and (2) effects of biochar on salinity and productivity of millet at Ndof. During their stay in Senegal they monitored subterranean water levels and the effect of soil amendments on soil conditions in experimental plots. The millet plants were eaten by livestock before reaching maturity, providing only data on soil amendments without yield data. They repeated again these experiments during the rainy season 2015.

The project also conducted training and supervision activities for producers on good practices in production (seedling production, mechanical and manual land cultivation, reforestation, etc.). ANCAR organized a training workshop November 14, 2014 at Ndoff with a 50 producers composed of 21 men and 29 women. ANCAR also trained farmers on using the tiller and helped the establishment of management committee of this important tool.

After the symposium in January 2015, most of the activities included planning, preparation and implementation of activities of the rainy 2015 campaign.

### *Improving the Productivity of Rainfed Rice in Casamance*

ISRA/Djibelor harvested rice from seed multiplication plots during the quarter. Four tons of different varieties for different environments: *nappe* (4), *bas-fond* (6), upland rainfed (6), and mangrove (3).

ANCAR completed village demonstration of registered varieties not well-known in Casamance. It led to participatory breeding trials (*selection varietale participative*, or SVP) with several producers each in nine villages (Karthiack (5 varieties + local), Badiatte (3 varieties + local), Bassaf (5 varieties + local), Kamobel (NERICA 1, 4, 6, 8, 14 +local), Ndorna (NERICA 1, 4, 6, 8, 14 +local), Manjak (NERICA 1, 4, 6, 8, 14 +local), Kanwali (NERICA 1, 4, 6, 8, 14 +local), Bogal (NERICA 1, 4, 6, 8, 14 +local), and Koussy (NERICA 1, 4, 6, 8, 14 +local). NERICA 8 and NERICA 14 were the best. It was recommended to ISRA to produce enough quantity of foundation seed of these two varieties for the next season.

*For training and exchange visits:* 5 CAR (ANCAR technicians) were trained by technicians ISRA / Djibelor on production, storage of rice seed, rice pest control, and fertilization and cultivation techniques; 120 farmers including 57 women have benefited from the training sessions gear organized by ANCAR's CARs; and 5 exchange visits were organized.

Graduate students Ndeye Helène Diallo and Thioro Fall set up soil amendment tests: commercial lime, lime from shells, and biochar on-station at ISRA/Djibelor. Commercial lime was the best. There was also a beneficial effect of the shells. Soil water levels measuring devices were set up at the Djibelor station for long-term monitoring of water movement patterns that can explain salt intrusion.

Iron toxicity in the soil at the village of Badiatt was too high for plants to grow. The soil in the test parcel there had soluble iron concentration higher than 300mg/L, which is considered the critical limit for the cultivation of lowland rice. Iron toxicity is a significant barrier to increasing rice yields in Senegal which can only be solved with proper understanding of complex behaviors among multiple ecosystem components. In addition to the use of iron-tolerant rice varieties, improved soil

management represents the best chance for improving rice yield. This work may lead to recovery of currently unproductive lands that are considered necessary to meet targets for domestic rice production.

In the rest of time of fiscal year 2015, most of the activities included planning, preparing and implementing of activities of the rainy campaign.

### *Promotion of Local Rice in the Valley and Delta of the Senegal River*

ISRA/Saint-Louis completed village demonstration plots and a survey of grower preferences for these registered varieties (16 new varieties: 4 NERICA varieties and 12 Sahel varieties of which three were perfumed). Seed production of nine best varieties is ongoing. The pre-foundation seeds of these nine varieties were produced during the raining season 2014 and the foundation seed production in the off season 2015 by CIRIZ Dagana, FEPRODES and DRDR (Matam, Dagana and Podor). The macroeconomics team of ISRA (BAM) carried out consumer preference surveys of valley rice socioeconomic groups in Dakar. The survey of forty rice milling units in thirteen locations continued through October. The research was designed to find correlations between the quality of rice and the scale of the operation (artisanal, semi-industrial, industrial).

The growers' association, *L'Union des organisations de producteurs de Fanaye (Saint-Louis)*, received its approval as a certified seed producer for 2015. This success has been possible through the support of USAID/ERA within the collaborative research program on irrigated rice. In December, fourteen seed producers (2 men and 12 women) from Matam (Kobilo) received the last training in response to their request to become certified seed producers. In June 2015 the association received authorization as a certified rice seed producer for 2015. This GIE has 1,878 members divided into eight groups promoting women farmers. The group's achievement was due to training provided by DRDR as part of the technology transfer component of the rice research project.

### *Fortified instant cereal-based products for the Senegalese market.*

To date, the project has made significant progress towards its objectives: (1) The mini-extruder from Technochem, (from the U.S.) that was previously designed to process soya, was successfully re-modeled by Purdue and ITA engineers into processing local cereals. (2) Several combinations of cereal formulas have been already developed from millet, peanut and cowpea enriched with papaya, mango, carrot, or baobab flour (bouye). All formulas were well appreciated by the trained ITA panel. However the formula with papaya received the highest score. (3) Further, taking into account the finding #2, three new formulas were developed from millet, maize and sorghum combined with peanut and cowpea. All three formulas were enriched with papaya and tested for sensorial attributes comparatively with a Nestle formula, by the ITA internal panelists using a Hedonic scale (from 2 to 9). Although Nestle received the highest score (8), all 3 new formulas were accepted. Interestingly, the millet formula received the highest score among the new

products, slightly above 6 (6.55), the critical threshold to confidently launch a new product in the market. (4) Graduate student Cheikh Ndiaye has concluded his MS program at Purdue University.

### *Conservation agriculture using legumes in millet systems*

Graduate student Patrick Trail completed his final season of work for his Master's degree. His research looked at different planting schemes for incorporating mung bean into village food production as a short-cycle source of legume protein for the food insecure period of the “*soudure*” – the late rainy season when last year's food stocks may become depleted before the current year's harvest.

## **Result 2.2: Improved Outreach and Technical Support**

### **Annual Achievements**

#### **Village-to-village outreach**

During millet harvest in October 2014, ERA supported exchange visits in to Sandiara, Fissel, Meouane, and Fandène for growers to meet their peers and learn about the results of village-led inter-cropping demonstrations (Millet x Mungo bean; Millet x Cowpea). The demonstration tests consisted of using the results obtained by Patrick Trail as part of his thesis on the inter-cropping Mil x Mungo bean. The practices evaluated in these studies followed the guiding principles of Conservation Agriculture (CA) and focused on increasing yields of Senegal's major subsistence crop, pearl millet (*Pennisetum glaucum* (L.) R. Br.). The CA principles which are based on the three basic tenants of (1) crop diversification, (2) continuous ground cover, and (3) minimum tillage, have every potential to be adopted by the average smallholder farmer in Senegal.

The project focuses on enhancing local food security by improving the productivity and sustainability of millet-legume systems of central Senegal. We evaluated the effects of growing legumes in association (intercropping) with the primary cereal crop of millet. Mungbean (*Vigna radiata* (L.) Wilczek), a new alternative crop for Senegal will be evaluated for its ability to boost overall grain yields when intercropped with millet. All crops will be grown under rain-fed conditions with *no fertilizer, insecticide, or herbicide inputs needed*.

The results obtained through these demonstrations have created strong interest among the producers. This is what justifies the agreement USAID/ERA signed with USDA /CLUSA PSEM with support from ANCAR/Kaolack and Laboratoire Commun de Microbiologie—IRD-ISRA-UCAD. During rainy season 2015, tests have been installed at three sites in the regions of Kaolack and Fatick at Khelcom Birane, Keur Mandongo and Fissel under the supervision of a peasant leader and an ANCAR agent for each locality. These trials involved more than thirty producers: Khelcom Birane: 10; Keur Mandongo: 10 and Fissel: 15. These field activities are accompanied by training lead producers, agents of ANCAR and CLUSA and partners from other projects of USAID / Senegal.



### **Promoting institutional outreach to rural youth through 4-H**

USAID/Senegal, in collaboration with Peace Corps/Senegal, is supporting ENSA and ISFAR to diversify their community services deliveries using innovative extension approaches. The 4-H model promotes youth development and agricultural education in social and economic life. In December, an exchange meeting was held with academic leaders of ENSA and ISFAR, to advance the program's implementation. A field visit was organized at Toubacouta where the team had work sessions with the primary school of Ndoumboudj, youth center of Toubacouta and the youth association of Santamba. The team also met the parents of the children to explain the 4-H concept.

ERA's partners ISFAR and ENSA in collaboration with Peace Corps/Senegal and Virginia Tech 4-H then held a two-week master training for 25 people included community leaders, faculty members from ENSA and ISFAR, ANCAR extension agents, and Peace's Corps volunteers. The training culminated in the launch of three agricultural youth clubs based on the 4-H model: one at the primary school level, one at the secondary school level, and one for young adults. The 4-H master training and youth club launch in March marked the first known effort to establish 4-H in francophone West Africa. From April to June, USAID/ERA with ENSA, ISFAR, ANCAR and Peace Corp organized two follow up trips at Toubacouta to help the new established clubs in programming

### **Strengthening private/public partnerships**

ERA facilitated a MoU signed between a platform of private enterprises named POPAS and the University of Dakar (UCAD); 12 enterprises acting in food industry had been selected in order to get benefit from that partnership. Many work sessions have been held between them and the researchers at the university to identify the needs and weaknesses of their enterprises so that special trainings had been delivered to them in order to close the gap between theory and practice. In addition to that, many aspects and needs described within the MoU have been addressed thanks to a Fixed Obligated Grant that UCAD had signed with the project, described below.

*Short-term technical & practical trainings.* Series of training had been held for the 43 beneficiaries. Contents and results had been described in the respective deliverables given by faculty members of UCAD:

- Short term technical training on Packaging and Nutrition (Deliverable: N°9)
- Short term technical training on Setting nutritional tables (Deliverable: N°11)
- Short term technical training on Hygiene and traceability (Deliverable: N°3)
- Short term training on Marketing and commercialization (Deliverable: N°13)
- Short term technical training on Bar Code and Packaging (Deliverable: N°12)
- Short term technical training on Consumer Taste-Testing

*Setting a system of hazards analysis and critical control points (HACCP) in 12 SMES.* During a period of 4 weeks, faculty members from UCAD worked with 12 SMEs interacting directly with

the agro-food women-owned food processing business of POPAS in order to set up a HACCP system thus revising the technical methods or process of many products. The work was done in two parts. Contents and results are described in the respective deliverables given by faculty members of UCAD:

- Supporting food processing units (Progress Report on the diagnosis of the food processing Units) (Deliverable: N°6)
- Supporting food processing units (Progress Report of the implementation of HACCP tools at the enterprise level) (Delivvable:N°7)

*Setting up internship agreements between students and the agro-food women-owned food processing business.* Assimilation and effectiveness of the trainings and implementation of HAACP tools had been achieved thanks to the 15 students who have been put in each food processing units during 3 months. In addition to that monitoring, students and theirs teachers have the responsibility to guide those women and ensure that they respect and apply newly methods set as far as Hygiene and quality assurance are concerned:

- Supporting food processing units (List of approved students ) (Deliverable: N°4)
- Supporting food processing units (List of internship agreements) (Delivvable:N°5)

*Supporting the women’s manufactured products to be approved by the Senegalese government.* Faculty members of UCAD have done some series of analysis on the physio-chemical, biochemical, nutritional, microbiological aspects of some products and established nutritional tables for the same products manufactured in the 12 units.

- FRA submission to Senegalese department of food consumption (Deliverable: N°8)
- Establishment of nutritional tables (Deliverable: N°10)

*Supporting Consumer Taste-Testing Research with the collaboration of the mayor of Pikine Guediawaye.* After a short Technical Training about the technical, socio-cultural and psychological aspects of some products, consumer taste-testing research was held in the district of Guediawaye “Commune d’arrondissement de Golf-Sud” with the collaboration of the “Mairie” and all its committees. Eight (8) products (below) were tested with about 100 persons. The test was conducted by both students and faculty members from UCAD.

Product	Calibration /Size	Aroma	Type of Cereals	Place of harvest
Thiacry	Small	Netmug (Muscade)	Millet	Saint-Louis
Thiacry	Small	Naturel	Millet	Saint-Louis
Thiacry	Big	Netmug (Muscade)	Millet	Saint-Louis
Thiacry	Big	Naturel	Millet	Saint-Louis



<b>Products</b>	<b>Nature</b>	<b>Aroma</b>	<b>Place of Harvest</b>
Bissap	Red	Naturel	Diourbel, Toubacouta, Kaolack
Bissap	Red	Ginger	Diourbel, Toubacouta, Kaolack
Bissap	White	Naturel	Diourbel, Toubacouta, Kaolack
Bissap	White	Ginger	Diourbel, Toubacouta, Kaolack

*Graduation Ceremony.* A graduation ceremony had been held in UCAD in order to give to both students and members of POPAS their certificates. The Ministry of Higher Education and Research, the director of USAID/Sénégal, faculty members of UCAD, and others members of POPAS attended that event. President of Popas Miss Nafy Gueye took that opportunity to present new kits filled by POPAS products. At the end, products had been exposed with all the required elements in marketing and commercialization field.

### **Non-degree training of agricultural professionals**

In Year 4 ERA’s partners designed a certificate-level training program to address the knowledge gap of technicians, extension agents, and growers in certified seed production. The training of trainers was completed in Y4. Thus, in collaboration with partner institutions, stakeholders and the members of the monitoring committee, USAID/ERA organized a first theoretical training workshop for 22 participants on seed legislation, production techniques, control, and storage and seed conservation, from August 11 to 15, 2014 in Thies. To date, these trained trainers started a series of two-day producer-level training within their producer intervention area and 226 producers were trained. This series was completed in November. The 22 trainers received also practical and lab training in the Year 5 rainy season. During this practical training, the trainers were also building on the safe use of pesticides and spraying equipment (see also Component 1).

### **Constraints encountered and unresolved issues**

The rainy season in Senegal in 2014 was unlike any in over forty years. Apart from Casamance, the extremely late rains and sparse rains forced very late planting. In one case a graduate student had to return to the U.S. for fall semester classes before his experiment could be planted, requiring the work be left to people with less vested interest in ensuring good results. The rice plots in the Sine Saloum were heavily affected by insufficient rainfall. The field research programs need another growing season to achieve the expected results. Despite the fact that rain was very late, it arrived at the last possible time to plant millet and was distributed in quantities just sufficient to give a good millet harvest. In some places the yields were exceptionally good, perhaps because the unusual rain pattern disrupted insect life cycles and created an unfavorable environment for the development of mildew and other fungal diseases.

The timing of Peace Corps Volunteer placement is not ideal for associating a volunteer with the 4-H program and achieving the expected results before the end of Y5. However, Peace Corps is

likely to associate nearby volunteers in the effort while recruiting a third year volunteer into the position.

The sub-award to UCAD was as a fixed-price agreement and required detailed budgeting preparation that delayed the start of the training program compared to the work plan. However, once the sub-award was signed in early January, UCAD quickly started the training, having prepared an extensive set of training manuals in anticipation of starting its work.

## Component 2 Impacts

Many activities in Component 2 had not yet been completed by the end of the year, which is why the impacts indicated below are more potential (theoretical) impact than measured impact.

- SOSAT was determined to be the best millet variety by producers in Peanut Bassin. In addition to its good yield, it was preferred by producers because of its short-cycle, salt tolerance, small proportion of bran as well as a pleasing color and grain size. Many seed producer organizations already produce and sell seeds of this variety in great quantity every year.
- NERICA 8 and NERICA 14 were identified as the best varieties of rainfed rice in Casamance. It was recommended to ISRA to produce enough quantity of foundation seed of these two varieties for the next season multiplication.
- Commercial lime was identified the best to be the salty soil amendment in rice in Casamance. This result may lead to recovery of currently unproductive lands that are considered necessary to meet targets for domestic rice production
- The growers' association, *l'Union des organisations de producteurs de Fanaye (Saint-Louis)* and *l'Association des organisations de productrices de Kobilou* received its approval as a certified seed producer for 2015. This success has been possible through the support of USAID/ERA within the collaborative research program on irrigated rice.
- The mini-extruder from Technochem, USA that was previously designed to process soya was successfully re-modeled by Purdue and ITA engineers into processing local cereals. This machine allows ITA producing fortified instant cereal-based products for the Senegalese market. It can also be adapted and used by some entrepreneurs for their business. ITA, working with Ms. Mbacke, head of Darou Salam GIE which includes more than 3000 women processors, installed a modified bigger extruder in her workshops in Touba for full-scale tests.
- Mungbean (*Vigna radiata* (L.) Wilczek). This crop has created increasing interest among the producers and can be a new alternative crop for Senegal. Mungbean like many other food legumes has high nutritive value with high protein content about three to four times that of cereals. It is used as a food, feed (forage), or cover crop. As a food, dried beans may be eaten whole or split, cooked, or milled into flour to make pastas, soups, porridges, and confections. Mungbean is known for their sweet flavor, and mungbean paste is used in some Asian countries to make frozen ice desserts. After the Thiès region with

ANCAR/Thiès, ISFAR and ENSA, Kaolack and Fatick regions with ANCAR/Kaolack, USDA/CLUSA – PSEM and lead farmers, Yajeende wants to extend the demonstration plots along the Senegal River, in Matam and Bakel regions within Maize as intercropping plant.

- UCAD-POPAS MoU, as strengthening private/public partnerships. After the training of POPAS members by the faculty members of UCAD on packaging and nutrition and supporting the women's manufactured products to be approved by the Senegalese government, people began to pay more attention to POPAS's activities. More recently, the UCAD rectorate is moving towards signing a MoU with POPAS to use POPAS's products in the students' restauration. Moreover, governmental, diplomatic and employer's organizations have expressed interest in working with POPAS.

## Component 3: Management and Policy Support Strengthened

Component 3 supports development of a sustainable administrative and policy environment for human and institutional capital investments of AETR partners. Two key results are targeted in support of this effort: (1) Partner management and administrative systems are strengthened; and (2) Collaboration increases among AETR institutions in the development of policies that improve their contributions to the agricultural sector.

### **Result 3.1: Management and administration systems of targeted AETR partners strengthened**

#### **Annual Achievements**

##### **Quality Assurance and institutional strategic planning**

Through an MOU signed in Year 4 between ANAQ-Sup and ERA, joint workshops at university partners were planned for Year 5 in order to present the harmonized accreditation tools that ANAQ-Sup adopted from ERA and to increase understanding of the accreditation process that ANAQ-Sup is now applying to agriculture programs. In October, harmonization of the self-assessment tools was completed. Technical training workshops were held at UCAD, UGB, UASZ, ENSA and ISFAR. Having completed its institutional assessment, ISFAR proceeded to draft a strategic plan with ERA's support. A large success was that institutions started using the harmonized methodology in the process of their accreditation.

##### **Project management training**

The finance team prepared a syllabus for project management finance training for partner institutions. This training was not rolled out yet.

##### **Ministerial performance contracts**

CNFTEIA worked with a consultant provided by ERA to initiate discussions with its ministry and outline the elements of a performance contract that would tie funding to specific performance objectives. Ministerial performance contracts are a recent opportunity for universities to undertake special engagements with the Ministry of Higher Education and Research through the World Bank's WAAPP project. ERA's work with CNFTEIA is facilitating the application of the performance contract model to a national training center that responds to the Ministry of Livestock.

##### **Sustainability in gender work**

In transitioning from ERA's project-level gender strategy to individual institutional strategies, the chosen mechanism to help institutionalize the consideration of gender issues is to add two representatives to the TWG at each institution. These new members will be responsible for identifying and voicing ideas, opportunities, and concerns with respect to gender and to guide each TWG's development of an action plan. Starting in December the PMU discussed this idea with the TWG's of ENSA and ISFAR. The TWGs are being asked to select gender representatives as they broaden their responsibilities to become institutional platforms for dialogue and planning. By the

end of the Q2, gender representatives had been named to the TWGs of ENSA, ISFAR, CNFTEFCPN, and LTAEB.

### **Animating technical working groups**

To revitalize the TWG, ERA had planned to make quarterly meetings with those last. The first rounds of meetings started from February 2015 where the PMU staff met with the technical working groups of all partner institutions. Formed as a project implementation tool, the role of the TWGs has associated with ERA project rather than an institutional tool. These meetings focused on the sustained use of the TWGs to serve the institution outside of and after ERA. Participants conducted a SWOT analysis to advance the institutions' visions and missions. The second round of meetings took place at May 6-8.

## **Result 3.2: AETR Institutions are working together to influence policy decisions affecting the agricultural sector**

### **Annual Achievements**

#### **New law governing universities**

Just before the end of the 4<sup>th</sup> quarter, Senegal's *Assemblée Nationale* voted unanimously for a law (n°18/2014) providing new missions and governance for universities. The Minister of Higher Education and Research, Mary Teuw Niane, credited ERA and its efforts in exposing him and other higher education professionals to the U.S. model of agricultural universities (Land Grants) for inspiring several elements of the law. Most important is the addition of outreach as a university mission (*service à la communauté*), thus setting Senegalese universities on a track of substantial engagement with Senegalese society outside the confines of a formal classroom, with a clear goal of contributing to the social and economic development of Senegal. ERA also inspired the new governance structure in which half of a university's administrative board comprises members of the private sector. Promotion of student career services, an area of ERA capacity building, is now part of every university's responsibility.

#### **Groupe de Réflexion sur l'Agriculture et l'Agro-alimentaire au Sénégal (GRAAS)**

A meeting of GRAAS was originally planned for Q2, but the large number of other project activities as well as MESR events made it impractical in this quarter. It took place finally at August 3<sup>rd</sup> – 5<sup>th</sup> at Saly.

Chaired by the MESR, the workshop of GRAAS focused on three themes that are:

- Private Sector Integration in the functioning of universities
- The implementation of the mission "community service": advantages, constraints and opportunities
- The issues of inter-institutional gateways

The workshop took place in the form of introductory presentations and discussions in plenary, followed by group work and restitution. The emergent guidelines and recommendations of each theme were elucidated for the future action plan of the group.

### **Increase visibility of partner institutions at the national agricultural fair**

The *Foire Internationale de l'Agriculture et des Ressources Animales* (FIARA) was held in Dakar from March 26<sup>th</sup> to April 12<sup>th</sup>. For the first time ERA supported a “village” at the event, hosting every institutional partner plus women’s food processing groups. Under the theme of building institutional capacity for Senegal’s food security, the village featured booths on teaching, research, and public private partnership. ITA’s sweet corn giveaway made the village popular among the fair’s visitors and increased the public’s awareness of the crop, which is exported from Senegal fresh for canning, but is not widely known in Senegal.

### **Improve inter-institutional cooperation regarding shared challenges**

In this section, some activities are resumed as below:

- **March 26-April 12:** ERA hosted a “village” for its partners at the *Foire Internationale de l'Agriculture et des Ressources animales* (FIARA) – Dakar
- **May 21:** Research project coordinator’s meeting to plan upcoming activities from May to December 2015
- **June 04:** ERA coopted on the Peace Corp’s steering committee centered on agriculture
- **April 24:** Visit of US Ambassador Zumwalt at LTAEB (Bignona). During this visit, local partners showed the impact of ERA interventions in the Casamance
- **May 11-15:** Master training for two UASZ agroforestry professors on cashew production - Bobo Dioulasso, Burkina Faso

## **Operations and Administration**

Operations and administration were routine, but the PMU was challenged by the organizational/logistical tasks required to successfully host and implement all ERA activities. The PMU revised the Monitoring and Evaluation system, incorporating a document tracking feature to collect data for performance indicators and support the data quality assessment performed for submission of performance information to the FTFMS. The Y4 annual report was submitted. A review of the research projects was done in November and December. The PMU led planning and implementing of an ERA research symposium scheduled for January 2015. A fixed obligation grant was worked out with UCAD to support it training of woman-owned food processor businesses. ERA facilitated the signing of an MOU by CNFTEFCPN and IRD to collaborate on IRD’s USDA-funded project to improve cashew production in Casamance and the Gambia.

### **Communication**

Weekly activity summaries were sent regularly to USAID and project personnel (42). Eight electronic newsletters were published. Numerous posters, kakemonos and brochures were

prepared for the institutional partners featured at ERA's FIARA village and different events. In addition to these regular communications, six videos were realized to highlight different activities of the project such as the millet harvest of growers at Meouane, the testimony of scholars on the impact of the *Bourse d'Excellence* on their studies, the collaboration between UCAD and POPAS. Also, eight big events organized by the project were largely covered by national media (TV, newspapers, radio, online media), giving good visibility to the activities of the project.

## **Gender**

Project gender efforts focused primarily on planning and implementing a workshop with the Ministry of Environment and Sustainable Development to improve gender considerations in the curriculum of its three training centers as well as ENSA and ISFAR, whose graduates supply many of its employees. In the second time, ERA worked with MEDR to design a comprehensive gender assessment of its training programs and training centers and implemented field evaluation of the program. Also, ERA promoted the selection of a man and woman to focus on gender issues as members of each partner institution's TWG and challenging the TWGs to develop a gender action plan by the end of the year.

## **Constraints encountered and unresolved issues**

Training in financial management and project administration was delayed due to higher priority demands on PMU staff. A meeting of GRAAS was originally planned for this quarter, but the large number of other project activities as well as MESR events made it impractical in Q2 and unlikely until early Q4. USAID / ERA has undergone significant departure during the year 2015 and this is what has caused restructuring in the PMU staff.

## Annual Performance Indicator Table

Indicator	Disaggregation		FY15 Targets	FY15 Actual	% of Target	FY16 Target	Comments
1.1.1. Number of AETR professors trained in syllabus development/ curriculum design			50	112	224%	200	Target includes all AETR education/training actors, not just professors
1.1.2. Number of syllabi developed by AETR institutions			100	63	63%	120	Many syllabi were still in development at the end of FY15
1.1.3 Number of students in classrooms receiving course syllabi		Male	1400	1487	106%	1400	
		Female	600	460	77%	500	
		<b>Total</b>	<b>2000</b>	<b>1947</b>	<b>97%</b>	<b>1900</b>	
1.2.1 Number of individuals who have received USG supported long-term agriculture sector productivity or food security training [FTF 4.5.2(6)]	Local scholars	Male	46	48	104%	0	
		Female	59	59	100%	0	
		<b>Total</b>	<b>105</b>	<b>107</b>	<b>102%</b>	<b>0</b>	
	US scholars	Male	10	10	100%	6	
		Female	9	9	100%	8	
		<b>Total</b>	<b>20</b>	<b>19</b>	<b>95%</b>	<b>14</b>	
	New	Male	0	2	100%	0	
		Female	0	0	--	0	
		<b>Total</b>	<b>0</b>	<b>2</b>	<b>100%</b>	<b>0</b>	
	Continuing	Male	56	56	100%	6	
		Female	68	68	100%	8	
		<b>Total</b>	<b>124</b>	<b>124</b>	<b>100%</b>	<b>14</b>	
<b>Total</b>		<b>124</b>	<b>126</b>	<b>102%</b>	<b>14</b>		
1.2.2 Number of faculty members and students trained in:	Faculty members (distance and distributed learning, subject matter competencies, other)	Male	90	147	163%	80	
		Female	10	33	330%	20	
		<b>Total</b>	<b>100</b>	<b>180</b>	<b>180%</b>	<b>100</b>	
	Students (distance and distributed learning, career management, other)	Male	57	63	111%	200	
		Female	68	17	25%	100	
		<b>Total</b>	<b>125</b>	<b>80</b>	<b>64%</b>	<b>300</b>	
	<b>Total</b>		<b>225</b>	<b>260</b>	<b>116%</b>	<b>400</b>	
1.2.3 Number of students participating in private sector internships		Male	40	8	20%	60	
		Female	20	7	35%	30	
		<b>Total</b>	<b>60</b>	<b>15</b>	<b>25%</b>	<b>90</b>	
1.2.4 Number of AETR faculty members and		UCAD	3	15	500%	3	
		UGB	3	0	0%	3	



Indicator	Disaggregation	FY15 Targets	FY15 Actual	% of Target	FY16 Target	Comments
students registered on InnovATE's online community of practice	UASZ	3	1	33%	10	
	UT	3	0	0%	3	
	ENSA	3	0	0%	3	
	ISFAR	3	2	67%	3	
	ITA	3	1	33%	3	
	ISRA	3	0	0%	3	
	CFPH	1	2	200%	1	
	CNFTEFCPN	2	3	150%	1	
	CNFTEIA	1	0	0%	1	
	LTAEB	2	1	50%	5	
	Others		23	100%	10	
<b>Total</b>		<b>30</b>	<b>48</b>	<b>160%</b>	<b>47</b>	
1.3.1 Number of public-private partnerships formed as a result of FTF assistance <i>[FTF 4.5.2(12)]</i>		1	1	100%	6	
1.3.2 Number of higher education partnerships between international institutions and host country higher education institutions that address regional, national, and local development needs		0	1	100%	0	
1.3.3 Number of AETR institutions tracking the employment of graduates		2	5	250%	5	
1.3.4 Number of AETR institutions conducting self-assessments to improve institutional performance		1	2	200%	2	
2.1.1 Number of new technologies or management practices under research as a result of USG assistance <i>[FTF 4.5.2(39)-I]</i>	Millet	17	18	106%	17	The climate change technology was not targeted because it was not correctly identified as a climate smart agricultural practice (i.e., salt-tolerant cereal varieties)
	Maize	1	1	100%	1	
	Rice	5	7	140%	5	
	Climate change	0	1	200%	2	
	Other aspects of Food security or economic growth	1	2	200%	1	
	<b>Total</b>		<b>24</b>	<b>29</b>	<b>121%</b>	
	Millet	1	1	100%	1	

Indicator	Disaggregation	FY15 Targets	FY15 Actual	% of Target	FY16 Target	Comments
2.1.2 Number of new technologies or management under field testing as a result of USG assistance [FTF 4.5.2(39)-II]	Maize	0	0	--	0	
	Rice	1	3	300%	1	
	Climate change	0	0	--	1	
	Other aspects of Food security or economic growth	2	0	0%	2	
	<b>Total</b>	<b>4</b>	<b>4</b>	<b>100%</b>	<b>5</b>	
2.1.3. Number of new technologies or management practices made available for transfer as a result of USG assistance [FTF 4.5.2(39)-III]	Millet	0	0	--	1	
	Maize	0	0	--	0	
	Rice	2	0	0%	1	
	Climate change	0	0	--	1	
	Other aspects of food security or economic growth	1	1	100%	0	
	<b>Total</b>	<b>3</b>	<b>1</b>	<b>33%</b>	<b>3</b>	
2.1.4. Number of farmers and others who have applied improved technologies or management practices as a result of USG assistance [FTF 4.5.2(5)]	Male	500	97	19%	300	We anecdotally have hundreds more farmers and others applying improved technology, but the M&E system failed to adequately track them.
	Female	250	27	11%	150	
	<b>Total</b>	<b>750</b>	<b>124</b>	<b>17%</b>	<b>450</b>	
2.1.5 Number of private enterprises, producers organizations, water users assoc, women's groups, trade and business assoc and community-based organizations (CBOs) that applied improved technologies or management practices as a result of USG assistance [FTF 4.5.2(42)]	Private enterprises	6	0	0%	3	
	Producer organizations	9	9	100%	15	
	Water users	2	0	0%	0	
	Women's groups	11	13	118%	140	
	Trade & business associations	2	0	0%	4	
	Community based organizations	0	0	--	0	
	<b>Total</b>	<b>30</b>	<b>22</b>	<b>73%</b>	<b>162</b>	
	New	15	21	154%	140	
	Continuing	15	1	7%	22	
	<b>Total</b>	<b>30</b>	<b>22</b>	<b>73%</b>	<b>162</b>	
2.1.6 Number of food security private	Private enterprises	10	17	170%	0	

Indicator	Disaggregation		FY15 Targets	FY15 Actual	% of Target	FY16 Target	Comments
enterprises (for profit), producers organizations, water users associations, women's groups, trade and business associations and community-based organizations (CBOs) receiving USG assistance [FTF 4.5.2(11)]		Producer organizations	11	50	454%	15	
		Water users	0	0	--	0	
		Women's groups	32	16	50%	140	
		Trade & business associations	2	1	50%	4	
		Community-based organizations	0	0	--	0	
		<b>Total</b>	<b>55</b>	<b>84</b>	<b>153%</b>	<b>159</b>	
		New	0	80	100%	122	
		Continuing	55	4	7%	37	
		<b>Total</b>	<b>55</b>	<b>78</b>	<b>142%</b>	<b>159</b>	
2.2.1. Number of individuals who have received USG supported short-term agriculture sector productivity or food security training [FTF 4.5.2(7)]	Producers	Male	480	425	89%	450	
		Female	300	205	68%	3800	
	People in government	Male	30	69	230%	20	
		Female	10	6	60%	10	
	People in private sector	Male	30	23	77%	10	
		Female	10	34	340%	10	
	People in civil society	Male	0	10	100%	0	
		Female	0	4	100%	0	
<b>Total</b>		<b>860</b>	<b>776</b>	<b>90%</b>	<b>4300</b>		
2.2.2. Number of partnerships developed to deliver training services to local farmers and the private sector			2	1	50%	1	
3.1.1 Number of AETR members trained in administration, finance or M&E			30	23	77%	20	
3.1.2 Number of AETR institutions completing performance contracts with their respective ministries as a result of FtF assistance			1	1	100%	2	
3.2.1. Number of AETR stakeholder action plans for improving higher education policies for quality assurance			0	1	200%	1	
Communication plan available and updated			1	1	100%	1	

Indicator	Disaggregation		FY15 Targets	FY15 Actual	% of Target	FY16 Target	Comments
Number of communication updates			24	39	162%	40	
Number of newsletters			3	6	200%	12	
Number of weekly reports			32	42	131%	45	
Number of success stories			2	0	0%	7	
Number of highlight media coverage			5	8	160%	12	
Number of insertions in national newspapers			3	0	0%	2	
Number of video reports			--	6	--	3	
Number of participations on fairs and exhibitions			--	2	--	1	