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IMPROVING COUNTRY CAPABILITIES FOR AGRICULTURAL STATISTICS

BUILDING NATIONAL CAPACITY FOR TRACKING AND ANALYSIS OF THE AGRICULTURE SECTOR

APRIL 2015
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ACRONYMS

ANSD	*Agence Nationale de la Statistique et de la Démographie* (National Agency of Statistics and Demography)
CILSS	*Comité Inter-Etat de Lutte Contre la Sécheresse au Sahel* (Inter-State Committee for Drought Control in the Sahel)
COD-A	*Codification-Agent*, (Coding-Agent sheet)
CS	*Controle du Superviseur*, or Supervisor Control Sheet
CSE	*Centre de Suivi Ecologique* (Ecological Monitoring Centre)
CSPro	Census and Survey Processing System
DAPSA	*Direction de l'Analyse, de la Prévision et des Statistiques Agricoles* (Directorate of Analysis, Forecasting and Agricultural Statistics)
DIAPER	*Diagnostic Permanent* (Permanent Diagnosis)
DR	*District de Recensement* (Census District)
DRDR	*Direction Régionale du Développement Rural* (Regional Directorate of Agricultural Development)
FAO	Food and Agricultural Organization
FTF	Feed the Future
GPS	Global Positioning System
ICT	Information and Communication Technologies
MAER	*Ministère de l'Agriculture et de l'Equipement Rural* (Ministry of Agriculture and Rural Equipment)
MSU	Michigan State University
PCE	*Projet Croissance Economique* (Economic Growth Project)
QDR	*Questionnaire District de Recensement (*Census of households in sample DR)
QE	*Questionnaire Entreprises et Gros Producteurs (*Entreprises and Large-scale Producers Questionnaire)
QM	*Questionnaire Ménage* (Household Questionnaire)
QP	*Questionnaire Parcelle* (Plot Questionnaire)
QR	*Questionnaire Rendements* (Crop Yield Questionnaire)
RGPH	*Recensement Général de la Population et de l'Habitat (*General Population and Housing Census)
SCQ	*Suivi Circulation Questionnaire* (Questionnaire Circulation Tracking Sheet)

SPSS	Statistical Package for the Social Sciences
SRDR	*Société Régionale de Développement Rural* (Regional Rural Development Entity)
UCAD	*Université Cheikh Anta Diop de Dakar* (Cheikh Anta Diop University of Dakar)
USAID	United States Agency for International Development
WFP	World Food Program

PREFACE

This technical note is one of a series of short papers produced by USAID/Senegal's *Projet Croissance Economique* (PCE), or Economic Growth Project, implemented by IRG, an Engility company, from 2009-2015. The purpose of the series is to share experiences and lessons learned with implementing partners, United States Agency for International Development (USAID), and the broader development community.

This paper is intended to serve as an informational tool for those wishing to engage in similar activities and who need more details on both technical aspects and implementation methodologies. As such, it is not an evaluation, though it does present important program results and discussions on impacts.

The primary goal of PCE is to promote food security by linking small-scale cereal farmers (rice, maize, and millet) to certified seed and commercial grain value chains to boost their productivity and diversify their incomes. USAID/PCE activities support certified seed production and distribution alongside structural investments in seed processing centers and certification labs; increased agricultural processing capacity; new market linkages between producers and the private sector for distribution, processing, and storage; introduction of new quality grading and packaging standards developed at the grassroots level to foster national and regional trade competitiveness; increased access for small farmers to agricultural insurance and tailored cashflow-based financing mechanisms; policy reform; and capacity building of Government, farmer organizations, and financial sector actors relative to the functioning, monitoring, and governance of cereal value chains including risk reduction and response strategies.

As PCE is an integrated program, a number of broad messages apply across the series. One above all is that there truly is no "one size fits all" approach to be applied across all sectors. In fact, the project team considers as a best practice the iterative implementation of a set of models to tailor them to the varying needs along different Feed the Future (FTF) value chains in different regions of the country.

INTRODUCTION

Each year, the Ministry of Agriculture, through the Directorate of Analysis, Forecast and Agricultural Statistics (DAPSA), conducts an agricultural survey on major crops, which serves as the main source of data on Senegal's agricultural sector. A wide range of stakeholders, including policy makers, researchers, the private sector, professional organizations, and technical partners use the results of these annual surveys in their work. The statistics are also shared with international organizations such as the Inter-State Committee for Drought Control in the Sahel (CILSS), the Food and Agricultural Organization (FAO), and the World Food Program (WFP), among others. The data is of strategic importance for the Government and other stakeholders as it is used to inform important activities, such as agricultural sector planning, the national Early Warning System for Food Security, and the formulation, monitoring, and evaluation of agricultural sector development policies and programs.

Perhaps the most critical application of DAPSA's area and production estimates are the annual Senegal National Accounts reports compiled by the National Agency of Statistics and Demography (ANSD). Other users tend to be linked to the ad hoc needs of programs, projects, and ministries, as described above. Therefore, when issues persistently arose related to the reliability and timely availability of survey results, the improvement of the national agricultural statistics system became a priority area for USAID/PCE through its policy support component. The intervention process has been iterative, as addressing each constraint revealed the next layer of underlying challenges remaining, which would become the focus of the next round of intervention.

While project support was primarily financial and material in nature, it also had a strong technical assistance component that has included the provision of national and international expertise. The technical assistance focused on strengthening the in-house capacity of DAPSA staff and introducing methodological innovations through improved tools and information and communication technologies (ICT)-based approaches. The overall approach was characterized by an intentional, progressive transfer of technical and management skills and responsibilities, from technical support specialists to DAPSA staff.

BACKGROUND

Since the early 1980s, agricultural statistics were provided by the Regional Agriculture Inspectorates and Rural Development Agencies, which covered the agro-ecological zones throughout Senegal, but without a clear and unified guiding methodological framework. In the 1980s and 1990s, a data collection approach that had been introduced by the CILSS/DIAPER (Permanent Diagnosis) was used, which entailed calculating estimates for each administrative block and averaging the results up to the district level. However, this approach did not ensure reliable estimates – neither in terms of sample size (about 4,000 "*carrés*," or rural taxation family units, across 90 administrative sub-districts), nor the nature of the statistical unit of observation, as the parameters and names of zones were very unstable and changed frequently.

Furthermore, DAPSA was faced with serious challenges due to weak financial, logistical, and human resources. DAPSA has not had the trained staff or level of resources necessary to invest adequately in the analysis of the agricultural survey data it collects and processes. As a result, the statistics have not been used as widely as they could be to inform policies and plans. Limited analysis of DAPSA's annual agriculture survey effectively diminishes the value of what is a very significant investment by the Government of Senegal. The DAPSA is aware of this gap and has begun to plan and invest in a new Rural Economy Bureau (*Bureau d'Economie Rurale*) to fill this void. Staff hired and assigned to this office require significant orientation and training to make their work responsive to both the information needs and high quality standards of a broader range of potential users. It was in this context that the USAID Economic Growth Project (USAID/PCE) started providing technical and financial support during the 2009/2010-crop season, to enable DAPSA to produce an annual agricultural survey report with reliable data and in a reasonable timeframe.

MAIN ACTORS INVOLVED

There were six core actors involved in the overall process, consisting mainly of the key government reporting agencies and USAID/PCE, plus the technical support agencies that were made available through USAID/PCE. Throughout the five years of cooperation, USAID/PCE made several targeted investments aimed at building the capacity of DAPSA to collect, process, and analyze policy-relevant data and information. These investments included: operational support for the annual agriculture survey, Global Positioning System (GPS) and other surveying equipment, motorcycles, technical assistance from SYSCOM (a Senegalese consulting firm), and targeted technical assistance missions from Michigan State University (MSU) experts.

The focus was mainly in the areas of survey sampling, data collection, and the development of new satellite-based methodologies for estimating crop area and production forecasting.The core actors and their respective roles are as follows:

1. DAPSA: Responsible for preparation of survey tools, training of interviewers, fieldwork supervision, coordination with decentralized ministerial structures, capture and analysis, production and dissemination of statistical results, production and dissemination of specific reports.

2. MAER *(Ministère de l'Agriculture et de l'Equipement Rural)*: The Ministry of Agriculture and Rural Equipment supplies the basic material, human, and financial resources, and conducts the final validation of statistical results.

3. USAID/PCE: USAID/Senegal's Economic Growth Program provided targeted logistical and financial support, and mobilization of national and international expertise.

4. MSU: Michigan State University, Institute of International Agriculture, through USAID/PCE, provided methodological support for improving survey sample, data organization and analysis, capacity building and application of satellite imagery. MSU was the key partner for designing the agricultural statistics component of the USAID/PCE project. The scope of work was to strengthen Senegal's agricultural data collection, processing, and analysis for purposes of planning and development in the agriculture sector.

5. SYSCOM: Through USAID/PCE, SYSCOM provided initial round assessment of strengths and weaknesses for the first round of solution support to DAPSA, including on-site backstopping to the DAPSA technical team in the early phases of collaboration.

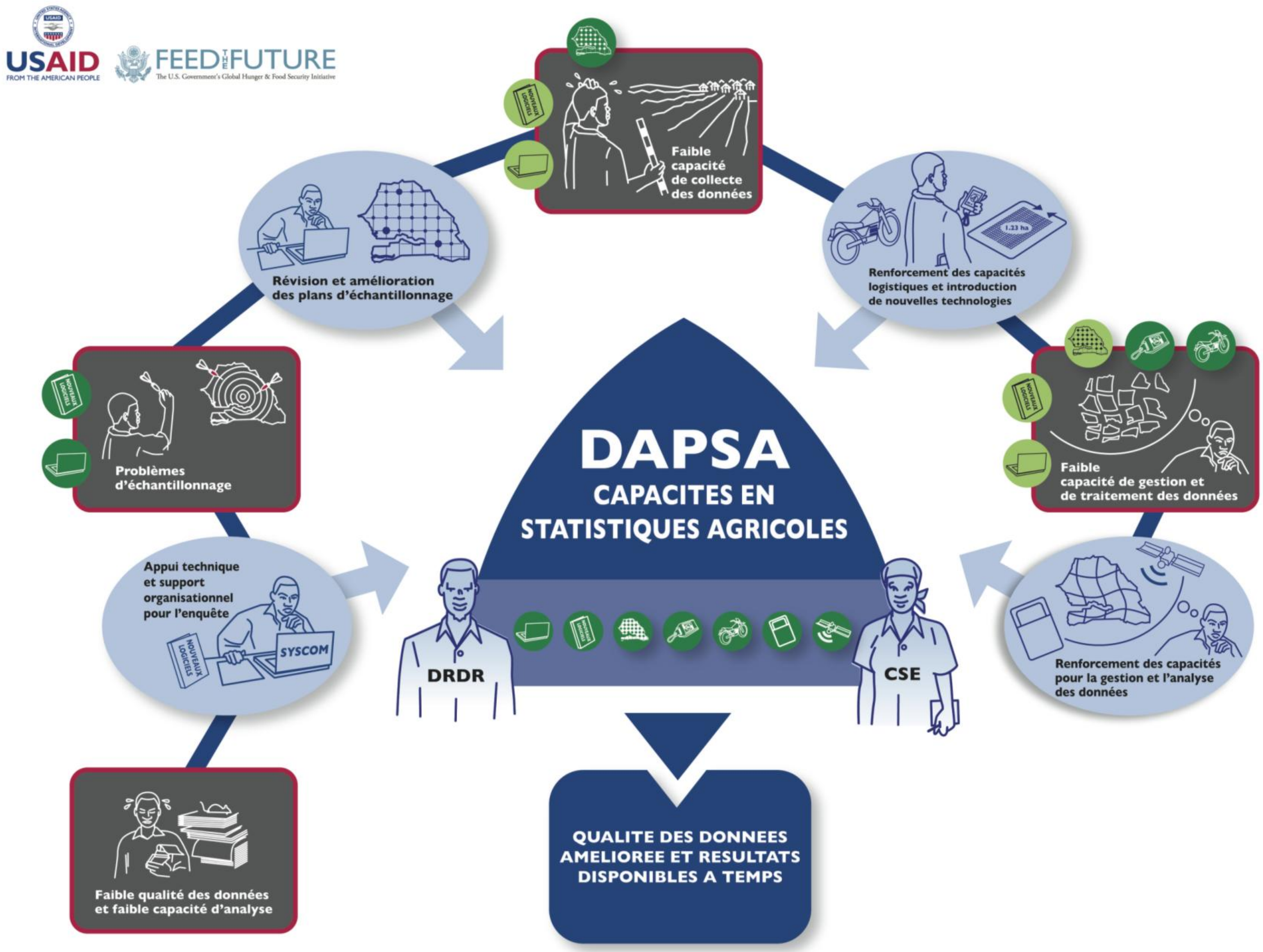
6. CSE *(Centre de Suivi Ecologique)*: Senegal's Ecological Monitoring Centre served as MSU's local counterpart for capacity building in remote sensing and production of crop maps. CSE provides technical assistance to the DAPSA's remote sensing division.

In addition to the core actors listed above, the DAPSA employs a national network of 150 surveyors, 84 inspectors, 14 regional supervisors, 42 departmental supervisors, and 15 national level supervisors. Coordination is managed centrally by DAPSA, regionally by Regional Directorate of Agricultural Development (DRDR), and at the district level by regional rural development entities (SRDRs).

ITERATIVE SUPPORT FOR IMPROVING NATIONAL CAPACITY FOR AGRICULTURAL STATISTICS

USAID/PCE's support to improving national capabilities for agricultural statistics entailed an iterative process throughout program intervention. Each year (aligned to the agricultural production and data collection timeframes), the program set out to address a key challenge or constraint, facilitating the appropriate support required. After each agricultural survey season was completed, support for remaining challenges was continued, and challenges that had been newly identified in the last cycle were added as additional areas of technical support in the subsequent year. For this reason, the overall process was iterative and non-linear, as each year's success or progress was built upon or deepened in each subsequent survey year.

The principle constraints and key areas of support are illustrated in the diagram on the following page, which also shows the convergence of the individual and institutional capacity development as internalized, adopted elements of the improved national agricultural data management capabilities, which as a whole have raised the quality, reliability, and sustainability of agricultural survey data.


Faible
capacité
de collecte
des données
Révision et amélioration
des plans d'échantillonnage
Renforcement des capacités
logistiques et introduction
de nouvelles technologies
1.23 ha
Problèmes
d'échantillonnage
DAPSA
CAPACITES EN
STATISTIQUES AGRICOLES
Faible
capacité de gestion et
de traitement des données
Appui technique
et support
organisationnel
pour l'enquête
SYSCOM
NOUVEAUX LOGICIELS
DRDR
CSE
Renforcement des capacités
pour la gestion et l'analyse
des données
Faible qualité des données
et faible capacité d'analyse
QUALITE DES DONNEES
AMELIOREE ET RESULTATS
DISPONIBLES A TEMPS

The initial support provided to DAPSA during the 2009/2010 season was twofold: (i) a financial component to facilitate the collection of field data, and (ii) a technical component to build capacity for quality control, organization, and treatment of the collected data. USAID/PCE technical support began with the hiring of a Senegalese consulting firm, SYSCOM, for their expertise in agricultural surveying.

The objectives of SYSCOM's involvement were as follows: (i) Support the preparation of an improved survey, providing overall supervision to the different collection components; (ii) Train and coach DAPSA technicians to master the tools and procedures necessary; (iii) Manage data collection and processing operations; (iv) Develop and implement an operations plan and a data analysis plan; (v) Organize and store the data; and (vi) Determine appropriate methods and channels to disseminate results. As a result of this work, the national network adopted the following survey methodology:

- The catalogue of 900 census districts (DRs), or primary units, from the 2002 General Population and Housing Census (RGPH) was used as a first-degree sampling frame.
- The second-degree sampling frame for each DR is comprised of an exhaustive list of farm households.
- The stratified two-stage sampling method treats the department as a strata.
- Drawing of the DRs is done with a discount and with unequal probabilities for the number of rural households in the primary unit.
- Drawing of secondary units (farm households) is done without discount and with equal probabilities.

Significant improvements were made during this first phase, especially in DAPSA's understanding of the methodology and appreciation for the utility of different survey modules for effective management and supervision of data collection activities. The results of that year's survey were statistically more rigorous, covering 3,200 households, and were publicized through the CountryStat website.[1] Based on these initial activities, a set of additional needs and opportunities emerged, which were targeted and addressed in the subsequent years, as described below.

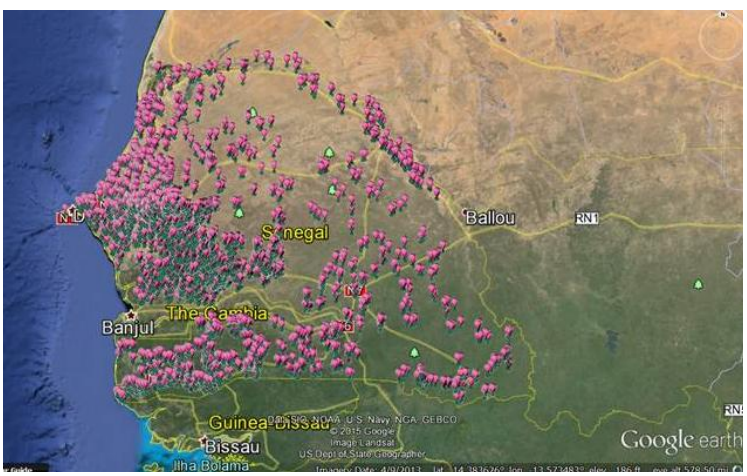
As previously mentioned, all subsequent rounds continued to build on most of the initial areas of support and new, targeted improvements were added as needed. All new rounds of collaboration also emphasized investments that would serve to reinforce the sustainability of new and improved practices, meaning that particular attention was paid to building capacity for handover of management and training responsibilities to the Government staff.

Deeper improvements to survey sampling and data collection. USAID/PCE continued technical and financial support into the second supported agricultural survey (2010/2011), with

[1] http://countrystat.org/home.aspx?c=SEN

particular attention devoted to addressing the poor sample size that had long impeded statistically viable survey results. Therefore, revising the sample variance calculation method, improving the tools used, and building staff capacity were the primary objectives for this round. This component of collaboration between DAPSA and USAID/PCE also led to other improvements in survey organization and implementation, including restructuring and consolidating survey contents; training analysts, inspectors, and supervisors; and introducing the use of GPS for precise plot measurements, counting census district households, and improving supervision and inspection procedures. Throughout subsequent years, three main resources were introduced and reinforced to fully accomplish these goals:

1. Improvement to survey sample size: The sample size used in the original methodology had become seriously outdated compared with the current population sizes of the administrative units. The small sample size also no longer represented the changing agricultural profile and landscape, and therefore called into question the reliability of results for the selected department. Furthermore, the base list of DR households had not been updated to reflect the new administrative boundaries, posing further challenges. To remedy this situation, the primary unit sample was improved, increasing the sample size from 3,200 agricultural households in the 2009/2010 survey to 6,300 in the 2010/2011 survey. A household selection table was produced for systematic random sample selection, and new variables were added to the survey to enhance understanding and measurement of living conditions of the agricultural population as well as issues relating to food security, such as nutritional aspects, gender, etc.



Location of geo-referenced plots of DAPSA's 2014 household sample

Geo-referenced plots of the village of Ndiaby (Bambey, Diourbel), 2014

2. Data collection and quality control guides were developed to reduce the large number of data collection sheets that are handled by field enumerators and the associated high risk of human error. The number of sheets used was reduced from nine in 2009/2010 to five in subsequent years, with sheets assembled by theme and bound in a "workbook" format containing the

following sheets: (i) QP *(Questionnaire Parcelle)* workbook for "Household Plots"; (ii) QR *(Questionnaire Rendements)* workbook for "Crop Yields "; (iii) QDR *(Questionnaire District de Recensement)* workbook for "Census of households in sample DR"; (iv) QM *(Questionnaire Ménage)* workbook for "Farm household characteristics"; and (v) QE *(Questionnaire Entreprises et Gros Producteurs)* workbook for "Farm enterprise and large agricultural producers," which was reduced to a two-record sheet.

Streamlining and simplifying the questionnaires helped ensure better control over the exhaustiveness of the sample while preventing data loss, which occurred often, particularly when collection sheets were kept separately. Officials responsible for data collection reported that the new questionnaire format enabled better file management and easier identification control of the surveyed units. Users' manuals for surveyors and controllers were also prepared and distributed to facilitate and harmonize the work across the agency.

3. Data collection applications: Two basic software applications are used for survey data processing: CSPro (Census and Survey Processing System) and SPSS (Statistical Package for the Social Sciences). Using CSPro, SYSCOM consultants and an MSU expert developed a new data input platform that makes it easy to manipulate and transfer data to SPSS or other statistical analysis software. Double data entry helps to establish control protocols to reduce the risk of data entry error, and has also been adopted in the system to identify and correct input errors. Once the data is entered, a re-entry field opens and the two files are presented side by side to detect differences. The validated file is exported to SPSS for tabulation and statistical analysis. The analysis plan takes into account the specific needs expressed by users and the potential outcomes of survey questionnaires.

Strengthening logistics, data processing systems, and quality control. To further reduce errors and improve data management efficiency, this area of capacity improvement entailed further strengthening of DAPSA's human and logistics resources. Once the survey sampling issue was addressed through the improved tools and methods mentioned above, the limitations of DAPSA's human resource base were brought to light. To cover the now significantly larger sample size, surveyors would need to cover more ground in the same amount of time. In addition, their measurement equipment, travel, and logistics tools were found to be far too outdated and limited to perform the work as efficiently as necessary. For this reason, in addition to the GPS devices and laptops that were provided in the first years of collaboration, USAID/PCE also facilitated the purchase of a set of basic equipment to address the clear logistical limitations posed by the increased sample – for a total of 150 motorcycles, 150 GPS devices, and 150 L squares. The original introduction of GPS had significantly increased data accuracy while reducing time spent measuring areas, accelerating the overall agricultural survey process and timeline for its publication. This was significantly bolstered with the acquisition of motorcycles, which considerably improved the surveyors' mobility. In prior years, a team of two investigators measured 6-9 parcels a day with old-fashioned tools (tape measures, etc.), whereas now, a *single* investigator with a motorcycle and a GPS device handles 12-15 parcels a day. In the final year of cooperation under USAID/PCE, GPS devices are already being retired from the logistics package and replaced with tablets and smartphones, which further enhance the collection speed, reliability, and transfer of survey data.

In addition to physical logistics support and the data processing tools that had already been developed, several additional file management tools were also created: A cluster identification register is used to verify the identity of each cluster and its coding; A tracking sheet of the questionnaire circulations (SCQ) is used to track the various changes made to the questionnaire from its creation to its final archiving; A Coding-Agent sheet (COD-A), which indicates the original data identification creation and the subsequent editing agent(s) for each cluster; and a Supervisor control sheet (CS), which contains the identifiers of the data cluster by control file and its associated data entry clerk.

Supporting data management and analysis through on-the-job training and collaborative analysis of priority policy issues. Following the addition of several important components in the DAPSA agricultural surveys, particularly in the household questionnaire (QM), support in the final years of collaboration focused on adding further value to the DAPSA survey program through enhanced, policy-driven analyses, graphics, and building capabilities for other outputs such as remote sensing maps.

Two support missions were carried out by MSU, specifically aimed at building DAPSA's survey data management, analysis, interpretation, and reporting capacities, through on-the-job training and support to DAPSA's new Rural Economy Office and other staff. In the interest of creating a National Strategy for the Development of Statistics in Senegal, structural and technical changes are necessary to achieve improvements in agricultural statistics. Each proposed change throughout the collaboration process has been discussed, taking into account the implications for improving the reliability of statistical estimates (error reduction), the timeliness of the estimates, and the reduction of costs associated with the collection and processing of data and the results report.

<u>Testing the use of satellite imagery to estimate areas</u>: After the previously successful incorporation of GPS technologies in the measurement of agricultural parcels, and building upon the improvements made in survey sampling and field surveying methods, USAID/PCE added focused support for developing and testing new satellite-based techniques for estimating production areas. The ultimate goal of these tests was to enable DAPSA to use ground-based field measurements combined with remote sensing technology to develop a satellite-based crop area estimation system.

The methodology employs the following data elements and tools: DAPSA field observations (i.e. parcel data); free and publicly available satellite data (i.e. MODIS Enhanced Vegetation Index (EVI) imagery); Timesat software package, used to extract phenology characteristics from EVI and deduce crop signatures; Linear unmixing, to classify EVI imagery across the entire country and calculate crop area distributions; and high resolution satellite imagery, for validation of the results. A team of experts from DAPSA, Cheikh Anta Diop University of Dakar (UCAD) and the national weather service (MétéoSénégal) participated in a four-week training program at

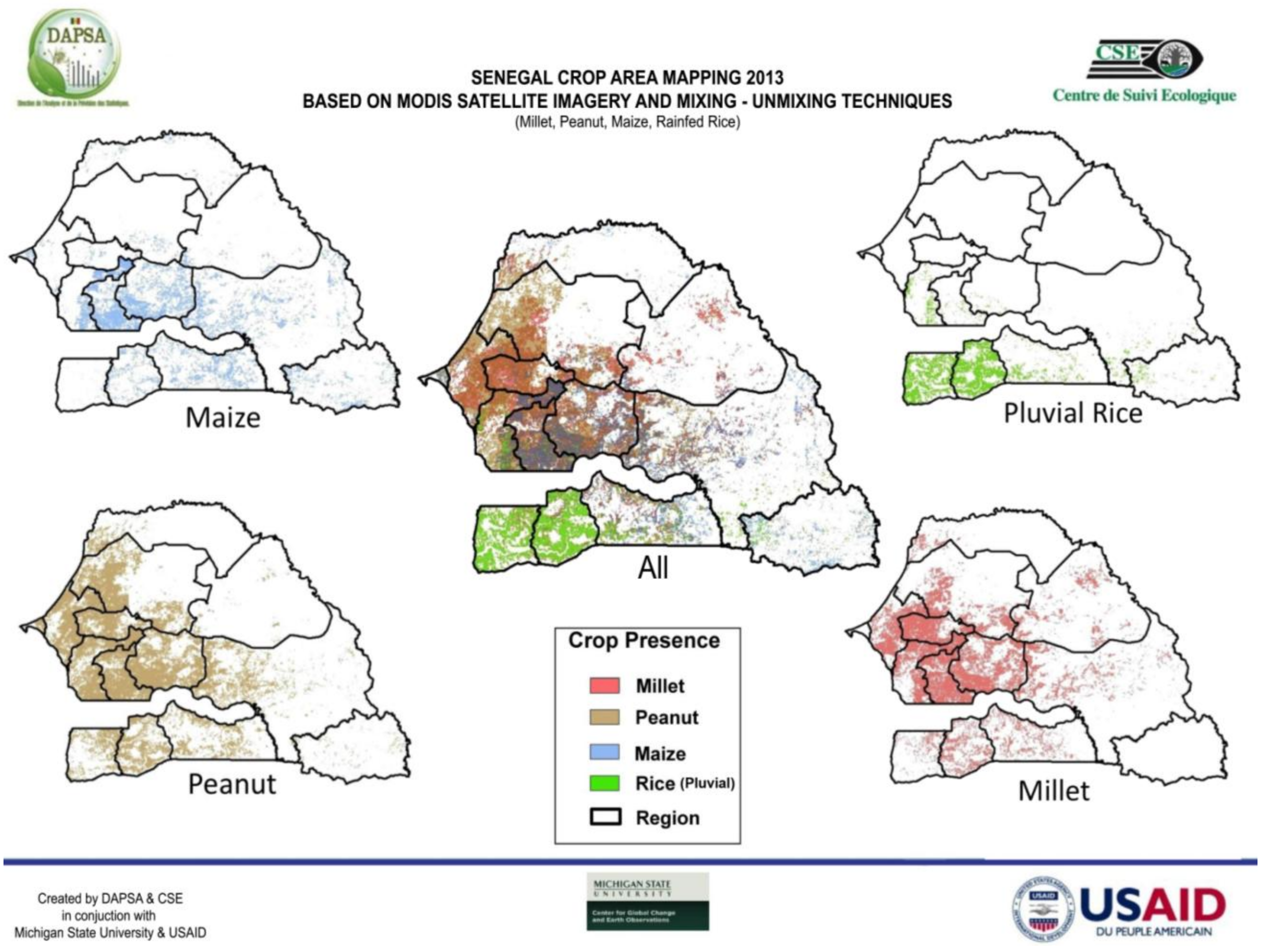
Michigan State University on this topic. During the training program, participants and MSU specialists began the process of downloading satellite data, conducting classification analysis, establishing zone and department level signatures and unmixing MODIS satellite images for Senegal's seven major crops. DAPSA has since been collecting complementary data across the country to enhance the robustness of the crop signatures and to reliably verify results.

This collaboration resulted in the development of a strong spectral unmixing method that uses phenological satellite data and produces more precise results. This methodology has immense potential in relation to mapping of the total area occupied by each crop, including the most important ones, such as groundnuts and millet. When optimized by the use of a DAPSA parcel data (QP sheet data), the system shows potential for an accurate estimate on the lower aggregation levels (community, etc.).

Development and testing of satellite imagery use has evolved to the point that the system can be integrated as a component of the annual agricultural survey of DAPSA program. This will reduce the sample from the annual survey to a more manageable size, reduce costs and the time required for extensive measurement of the plot (currently around 22,000 plots), and simultaneously improve accuracy of estimates. One of the main products of the work on the application of satellite imagery is the web-based Senegal Crop Mapping Information Platform[2], hosted on Michigan State University's "Center for Global Change" website. This platform allows users to browse, view, and analyze information on crops in near-real time from MODIS satellite images and to detect early warning triggers.

A dedicated remote sensing unit was also created within DAPSA to lead the work on satellite imagery and prepare for the phasing out of USAID/PCE technical assistance. USAID/PCE has also supported collaboration between DAPSA and the CSE to pursue and advance the integration agenda while developing internal capacity for effective adoption of remote sensing in the agricultural statistics system. To this end, 50 tablets were purchased by USAID/PCE for DAPSA to facilitate the agricultural survey operations and the real time transmission of collected data.

[2] Located at: http://35.9.159.124:22863/wms/



The above maps were generated by DAPSA, CSE, and MSU and shows the crop distributions for the 2013season

RESULTS AND LESSONS LEARNED

In summary, the support provided to DAPSA on agricultural statistics over the past five years has achieved the following:

Before PCE Support	After PCE Support
Characterization of the DRs and administrative coverage had not been updated since 1990.	Geographical mapping, demographic census, and updated description of the 900 DR samples, which allows for more appropriate weighting. The number of strata (districts) increased from 31 to 42.
Weak mobility and rudimentary equipment of field surveyors, causing delays in survey implementation and poor quality data.	Logistical equipment base bolstered by 150 motorcycles, 150 GPS, and 150 L squares, reducing parcel-level data collection time by approximately 70%.
4 households surveyed per DR.	7 households surveyed per DR.
Sample size of 3,600 households.	Sample size of 6,300 households
Variables were limited to acreage, production, and yields, which left serious gaps in meeting data needs.	New variables and new themes added (household income, use of inputs, food situation, etc.) providing a better picture of the rural agriculture situation.
Trainings delivered for supervisors for just 1 day before the survey launch, which was insufficient for a full understanding, especially for new staff.	Trainings of supervisors now held over 7 days to cover all aspects of survey implementation that could cause data inconsistencies if not done properly.
Scope of research limited to large-scale rainfed crops and smallholders, which caused very partial coverage of zones.	Scope of research broadened to include diversification and flood recession crops, as well as large producers, etc.
"Hands off" supervision of fieldwork prevented early detection of anomalies.	Strengthened centralized supervision of the survey implementation that allows monitoring and control of data on the field.
Technical knowledge of DAPSA's staff in statistical analysis was limited and outdated.	Technical support was provided and internal capacity built through support of SYSCOM, MSU, and CSE.
	DAPSA officers trained on all technical topics introduced and described above for the improvement of their statistics capacities.
Persistent issues with data dependability caused by human error in data handling.	Introduction of double entry method.
	Readjusting the weighting method and calculation of variances, which increases precision of extrapolated estimates.
Weak appreciation of scientific progress and the new technologies available for use in the agricultural statistics system.	Development of a model to estimate the planted area from satellite imagery.
	The creation of a web-based platform at MSU for the application of remote sensing.
	The establishment of a unit dedicated to satellite imagery in the DAPSA.
	Production of maps of major crops in 2013.
	Introduction of tablets and smartphones in place of GPS in 2014
Weak collaboration and exchange among and between other producers of agricultural statistics.	Seminars held to share practices and methodological innovations for all institutions producing agricultural statistics in Senegal (SAED, SODAGRI, SODEFITEX, DHORT, etc.).

The DAPSA's operational capacity to produce more reliable agricultural statistics, and to publish them on time, has been significantly strengthened over the past five years. Moreover, agricultural survey methods used by other agencies that produce agricultural statistics (SODEFITEX, SODAGRI, SAED, DHORT) were harmonized to facilitate the analysis of aggregated data and create a strong decision-making tool for public authorities as well as for private actors and development partners.

Each year, the survey now produces:

- An estimate of area, yield, and production of major crops by department
- An assessment of the quantities of inputs owned and / or used by producers
- An assessment of household grain stocks

The data provided every three years include:

- The structure and characteristics of the farm household population
- The livestock numbers attached to the farm
- An inventory of farm equipment

The USAID/PCE experience working to improve the DAPSA's capacity for agricultural statistics has provided insight into different elements of a successful endeavor to improve government institutions' technical capacity. Though these lessons are primarily focused on the unique case of agricultural statistics, there is potential for transference to other areas of technical support. Most notable lessons highlighted by the USAID/PCE technical team are:

Providing technical assistance to government agencies should avoid substituting internal staff that must remain on the front line to conduct the work assigned to them. If technical assistance consistently occupies a unique space, instead of providing side-by-side, on-the-job training, the improvements and gains made through the technical support will not be sustainable in the long-term. Furthermore, failing to apply this approach of side-by-side training increases the risk of building dependence on external technical expertise, and hinders the organizational internalization of improved practices.

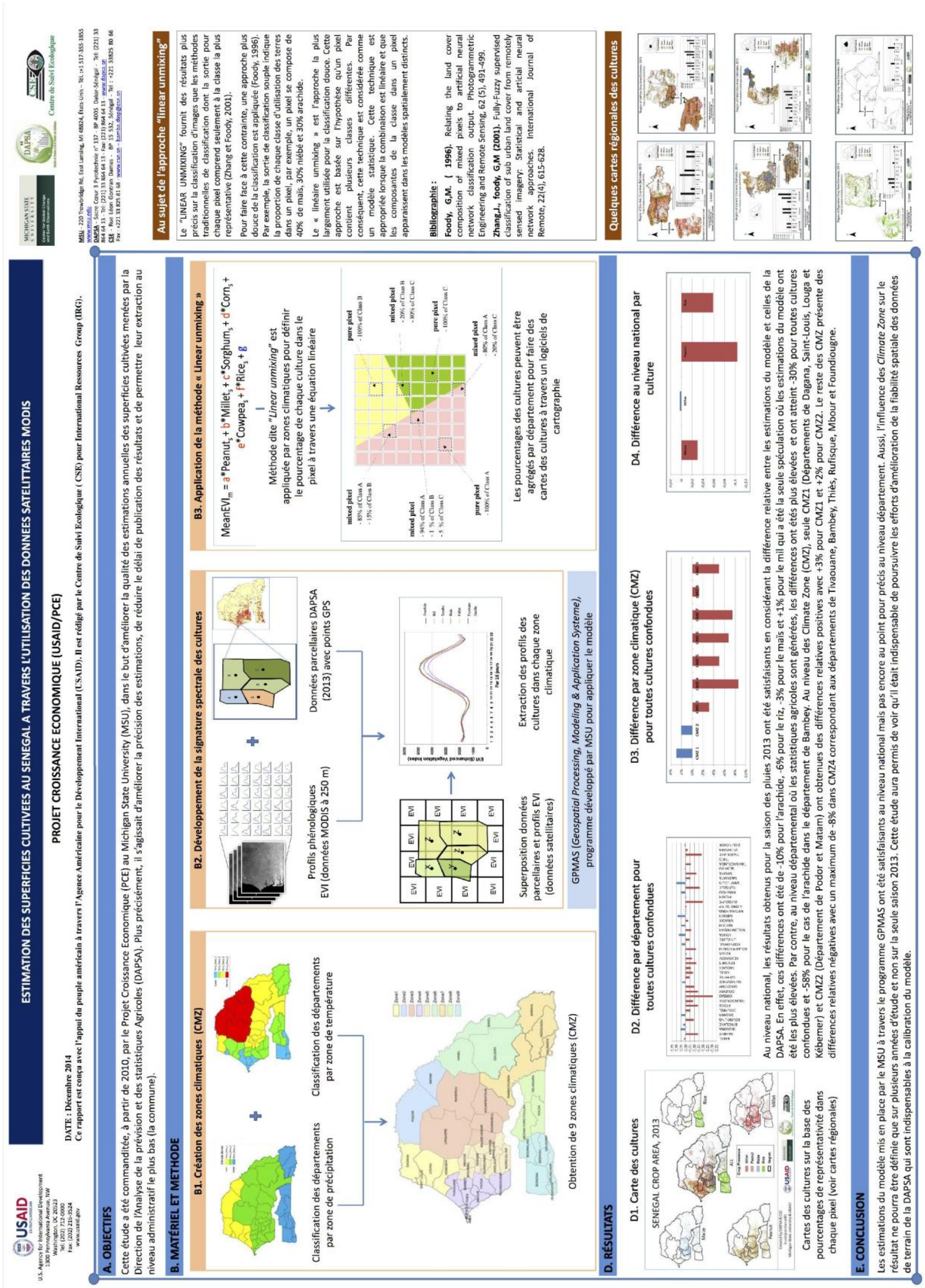
The operational utility of agricultural statistics is strongly related to their reliability and time of collection – that is, being collected at the appropriate time in the agricultural calendar. Furthermore, the availability of the results at the appropriate time to inform subsequent decisions is paramount. Thus, it is not enough to have sufficient budget allocation if the funds cannot be mobilized in time.

Strong institutional data collection capacity is crucial, but not more important than an equally strong capacity for effective management and exploitation of the data.

Better use of survey results through thematic analysis would encourage other users of agriculture statistics (FAO, WFP, JICA, BCEAO, the local authorities, etc.) to contribute alongside the Government of Senegal in funding efforts, making the system more financially sustainable.

Integrating the new methodology for satellite-measured crop areas into the agricultural survey system has shown significant promise in recent years, but may require some further technical assistance for DAPSA/CSE from the MSU team for an additional couple of seasons to ensure a complete and correct integration of all new technologies and methods.

ANNEX 1. SCIENTIFIC POSTER ON ESTIMATING CROP LAND IN SENEGAL



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