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AGRICULTURAL INSURANCE FOR CEREAL VALUE CHAINS

INTEGRATING CONVENTIONAL AND INDEX-BASED
INSURANCE MODELS INTO VALUE CHAIN
STRENGTHENING ACTIVITIES IN SENEGAL

APRIL 2015

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The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government

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ACRONYMS

AC	Automatically collected
ACAT	Automatically collect and automatically transmit
ACEP	<i>Alliance de Crédit et d'Epargne pour la Production</i>
ANACIM	<i>Agence Nationale de l'Aviation Civile et de la Météorologie</i>
CERAAS	Regional Studies Center for the Improvement of Adaptation to Drought or <i>Centre d'Etudes Régionales pour l'Amélioration de l'Adaptation à la Sécheresse</i>
CGER	<i>Centres de Gestion et d'économie Rurale de la Vallée du Fleuve Sénégal</i>
CIMA	Inter-African Conference on Insurance Markets
CMS	<i>Crédit Mutuel du Sénégal</i>
CNAAS	National Agricultural Insurance Company of Senegal or <i>Compagnie Nationale d'Assurance Agricoles du Sénégal</i>
DRDR	<i>Direction Régionale du Développement Rural</i>
FEPROMAS	<i>Fédération des Producteurs de Maïs du Saloum</i>
FTF	Feed the Future
GIIF	World Bank Group's Global Index Insurance Facility
GoS	Government of Senegal
GPRS	General Packet Radio Service
IFC	International Finance Corporation
MEC FEPRODES	<i>Mutuelle d'Epargne et de crédit de la Fédération des groupements de femmes Productrices de la région de Saint-Louis</i>
PAMECAS	<i>Partenariat pour la Mobilisation de l'Epargne et du Crédit Au Sénégal</i>
PCE	USAID/Senegal's <i>Projet Croissance Economique</i> or Economic Growth Project
SAED	<i>Société Nationale d'Aménagement et d'Exploitation des Terres du Delta du Fleuve</i>
SRV	Senegal River Valley
ToT	Training of Trainers
UIMCEC	<i>Union des Institutions Mutualistes Communautaires d'Epargne et de Crédit</i>
WFP	World Food Program
WMO	World Meteorological Organization

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 2009-2015¹. The purpose of the series is to share experiences and lessons learned with implementing partners, 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 USAID/PCE is to promote food security by linking small 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 USAID/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.

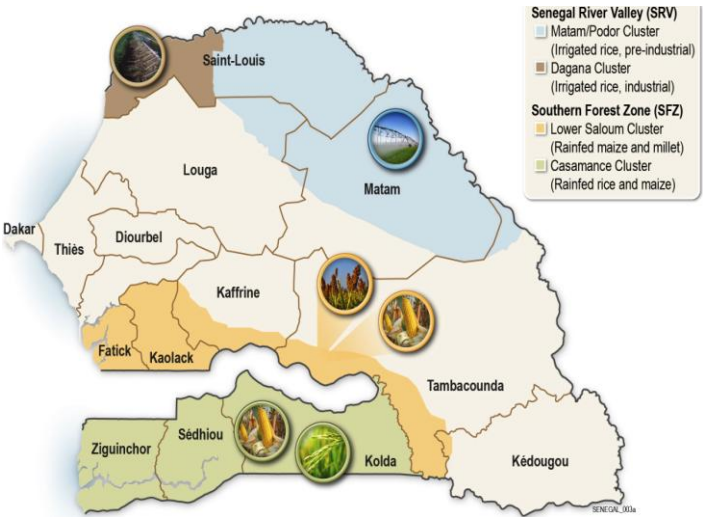
¹ Readers interested in accessing additional project reports and documentation should consult USAID's Development Experience Clearinghouse under project reference 685-1-00-06-00005-00 (<https://dec.usaid.gov/>)

INTRODUCTION

The design and dissemination of agricultural risk management instruments to improve investment environments for financial institutions is an ongoing challenge for the Senegalese agriculture sector. The Government of Senegal (GoS) supported a public private partnership² in 2008 to form the National Agricultural Insurance Company of Senegal or *Compagnie Nationale d'Assurance Agricoles du Sénégal* (CNAAS), whose mandate is to develop and provide relevant insurance products to actors in Senegal’s agriculture sector. The company is viewed as a pioneer for agricultural insurance in the CIMA (Inter-African Conference on Insurance Markets) zone, and succeeded in getting an agricultural insurance product on the market in record time. However, as a young company, CNAAS is still experiencing difficulties in smoothly aligning their operations with those of their partner financial institutions. They have also faced challenges extending their services to meet the present and urgent demand and differing needs throughout the country.

One of USAID/PCE’s objectives is to promote the integration of financing within a broader value chain strengthening approach that supports production, risk management, marketing, and building management capacities. It is within this context that the USAID/PCE project has sought to develop and expand access to agricultural risk transfer instruments, particularly for agricultural credit. Crop losses caused by variable rainfall patterns (timing, quantity, and intensity) as well as farm-level grain foragers are direct threats to farmers’ livelihoods and food security and represent one of the most significant risks to sustained agricultural development.

Because the nature of agricultural risk differs in Senegal based on the geographic region and, more importantly, based on the prevailing agricultural systems, USAID/PCE has worked with farmers, financial institutions, and insurance providers to support two critical risk management mechanisms – that is, two types of agricultural insurance – to protect farmers and financial institutions from the potentially devastating impact that crop losses have on incomes and production financing. In the central and southern areas of the country where agriculture is dependent on rainfall (“rainfed zones”), the introduction of index-based insurance for rainfed crops (rice, maize, and millet) has emerged as a cornerstone of the risk management approach. In the northern irrigated industrial production zone, USAID/PCE has also supported the promotion of a conventional (loss assessment-based) insurance mechanism that is tailored to the needs and concerns of farmers in the region.



² The PPP between the GoS (36%), the private sector (Senegalese insurance and reinsurance companies and an Ivorian reinsurance company (56%), farmer organizations (7%), other national private sector actors (1%) was approved by the Ministry of Economy and Finance through order No. 01289 of 10 February 2009, and represents two core forms of support from the Government: (1) that 50% of all premiums to cover insurance for major crops (rice, millet, sorghum, corn) will be covered by the GoS; and (2) agricultural insurance contracts are exempt from the government-imposed tax on insurance agreements.

ESTABLISHING AND MANAGING INDEX-BASED INSURANCE FOR RAINFED ZONES

To establish and implement the index insurance program, USAID/PCE partnered strategically with institutions targeting similar goals. This was particularly the case with PlaNet Guarantee, an insurance broker that was working in 2011 on establishing an insurance program for the World Bank Group's Global Index Insurance Facility (GIIF), which aims to facilitate access to index insurance for farmers in order to reduce volatile fluctuations in agricultural revenues and to secure the agricultural financing process. CNAAS, which, as described above, is the national entity specializing in agricultural risk management, was the third core entity to sign a partnership agreement that launched the process into action with USAID/PCE in late 2011. Aside from the three core leaders of the initiative, the project has required the involvement of many other key stakeholders and partners who are described below.

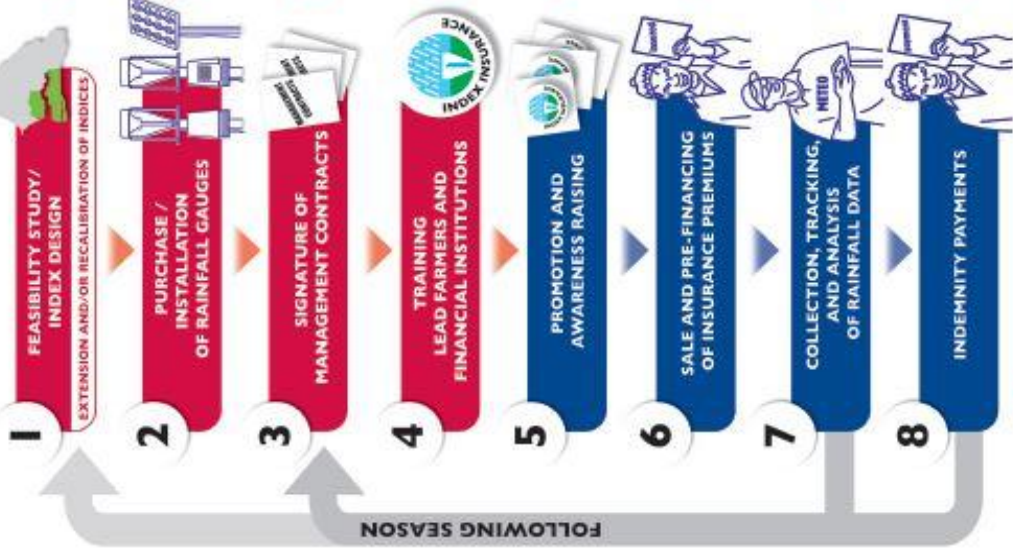
The index insurance program was primarily designed by USAID/PCE and PlaNet Guarantee, and was implemented in several stages. The diagram on the following page details the critical path followed for the establishment and continuous management of the index insurance system. The collaboration of the core management group began with the signing of the partnership agreement between CNAAS, PCE, and PlaNet Guarantee. The sequence of activities is presented with the role of each institutional actor, taking into account the specific context of Senegal and USAID/PCE implementation. The activities in the system are presented in two categories: those driven by the value chain actors in the core implementation group, in blue (CNAAS, the farmer groups, the financial institutions, ANACIM, etc.), and those driven by the design and facilitation support structure in red (USAID/PCE, PlaNet Guarantee, CNAAS). Overall, the insurance distribution and management approach and process remains the same for all areas and crops covered, although the actual indices vary according to crop and geographic location. Another element that varies is the cost of bonuses and compensation, which depends on the rates set and agreed upon by implementing actors.



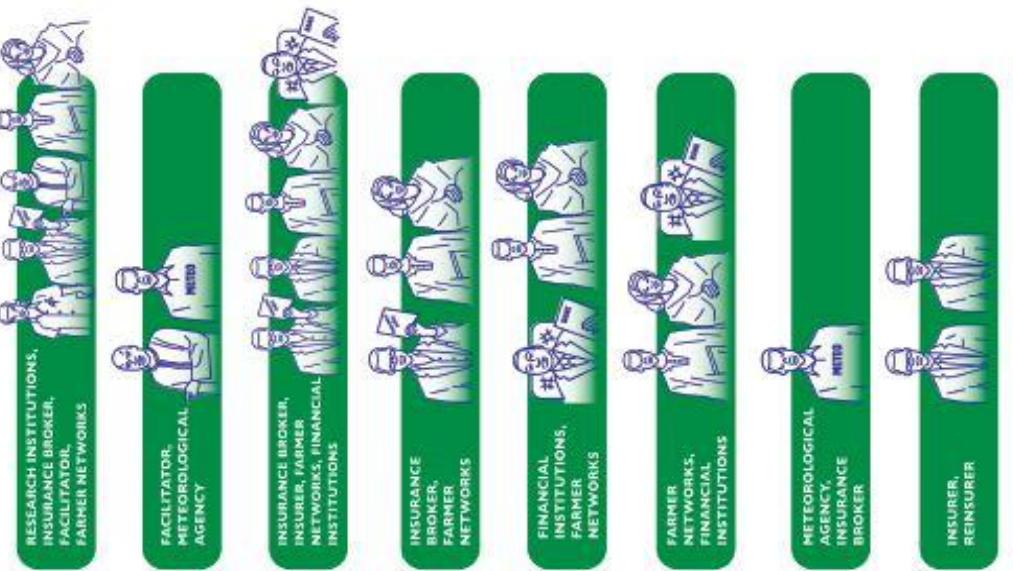
USAID
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FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

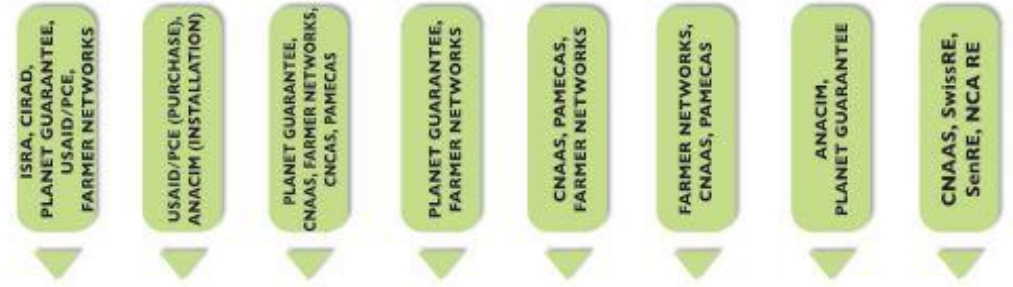
KEY STEPS



RESPONSIBLE ACTORS



SENEGALESE INSTITUTIONS



Led by core design and facilitation actors

Led by core implementation actors

Feasibility Study: At the start of the program, CIRAD conducted a feasibility study with participation from ISRA, PlaNet Guarantee, USAID/PCE, and producer organizations. The study was launched to determine the necessary conditions for development and calibration of an index, and followed a methodology that had been developed, tested, and proven by the GIIF in other countries. The study also utilized the SARRA-H modeling platform, developed by CIRAD, along with reconstructed historical rainfall data for the past 30 years using data from ISRA, CIRAD, CERAAS (Regional Studies Center for the Improvement of Adaptation to Drought or *Centre d'Etudes Régionales pour l'Amélioration de l'Adaptation à la Sécheresse*) and ANACIM. Finally, it took into account socio-economic data (cultural practices, production costs, etc.) for the regions under consideration. In line with the USAID/PCE Sustainable Systems-based approach,³ stakeholder farmers groups were fully involved from the beginning (and throughout implementation, as described below) contributing significantly to the socio-economic study and in validating the indices.

The feasibility study ultimately enabled the identification of the optimum rainfall data profiles for maize by factoring in agro-climatic risks and economic issues in the target regions. CNAAS took this study as the basis for agreeing to offer a new insurance product for rainfed maize producers that would ensure against rainfall deficiencies.

Index Design: The indices for maize and millet divide the crop season into three phases (of 10-day periods, known as “dekads”), and define drought risk by rainfall thresholds (known as “triggers”). The thresholds vary from one stage to another due to the difference in sensitivity of both maize and millet to precipitation in each phase of crop development. Because the index is calculated for a specific geographic area and crop, these thresholds are the same for all the zones covered. The table to the right shows the details of the indices used in the 2014 season for maize and millet.

The insurance coverage is active for the entire cycle of maize and millet production, starting with the first “useful” rains (20mm), which are expected in late June, through early July. In the event of seeding failure, the maximum level of coverage is 30%. Then, if rainfall for the period is below the indicated thresholds, it is considered that all production is lost and the maximum coverage value, set at the cost of production per hectare, including inputs such as seeds and fertilizer, should be

2014 Index Parameters for Maize and Millet Regions

	Maize 90 days			Millet 90 days
	Nioro, Ndofane, Koungheul	Kaffrine	Kolda, Velingara	Nioro, Ndofane
Start of sowing window (dekad #)	18	19	17	18
Close of sowing window (dekad #)	20	20	19	20
Coverage trigger (mm)	20	20	20	20
Dekadal ceiling (mm)	80	80	80	80
Start Phase 1 (dekad)	1			1
End Phase 1 (dekad)	4			4
Start Phase 2 (dekad)	5			5
End Phase 2 (dekad)	7			7
Start Phase 3 (dekad)	8			8
End Phase 3 (dekad)	9			9
Phase 1 Trigger (mm)	100			60
Phase 1 Release Threshold (mm)	40			20
Phase 2 Trigger (mm)	105			85
Phase 2 Release Threshold (mm)	60			40
Phase 2 Trigger (mm)	50			50
Phase 2 Release Threshold (mm)	10			10
Maximum Amount Insured per hectare	200,000			
Maximum indemnity (%)	80%			
Insured production costs Phase 1 (%)	80%			
Insured production costs Phase 2 (%)	80%			
Insured production costs Phase 3 (%)	80%			
Indemnity for seeding failure (%)	30%			
Minimum indemnity (FCFA)	3,000			

³ See note in this series on USAID/PCE's Farmer-Owned Extension Structures, which describes this approach in further detail.

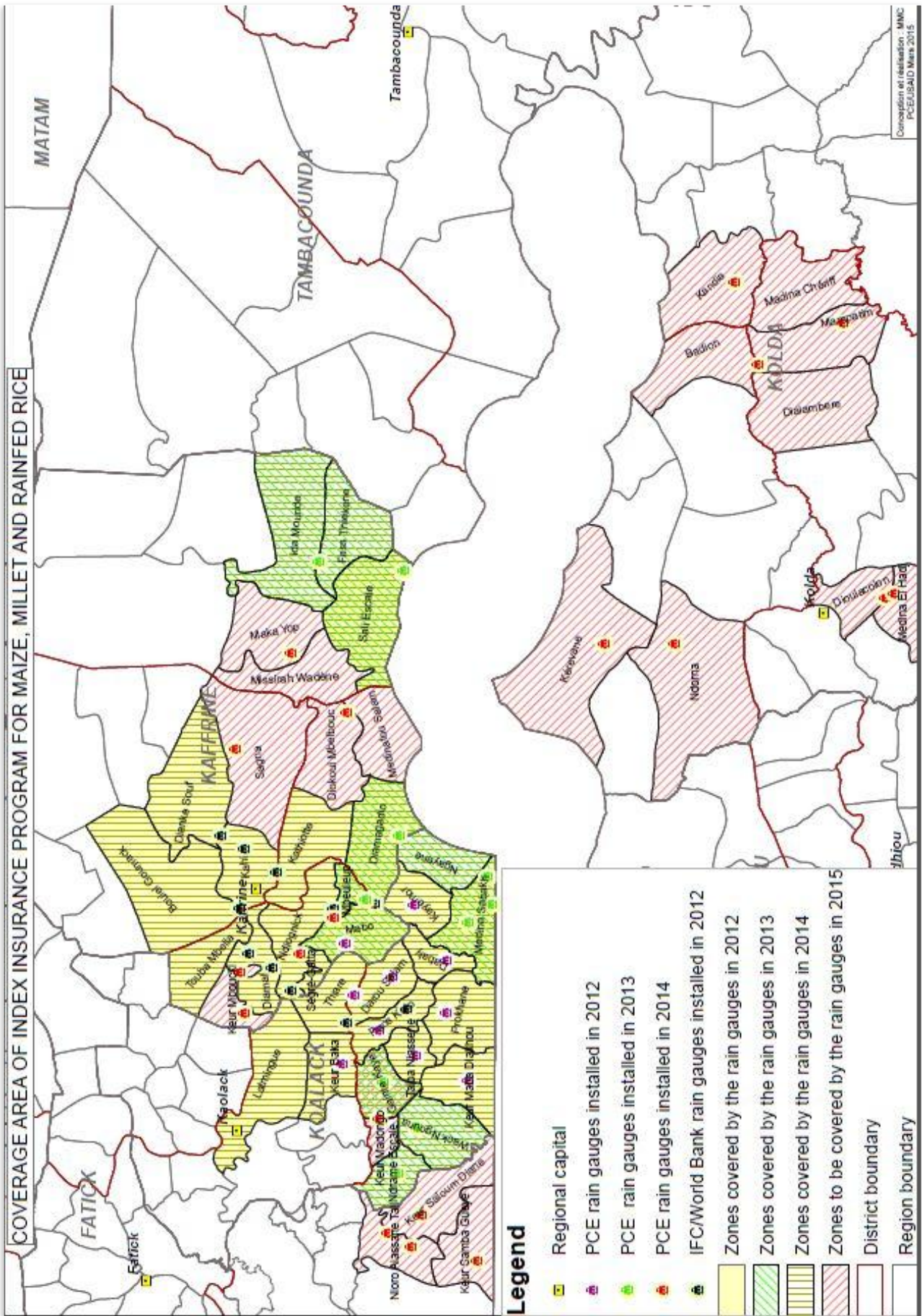
paid as an indemnity to the subscriber. The maximum coverage value as of Year 3 of the program is 80% of the total value insured.

Signature of Management Contracts: PlaNet Guarantee was designated by the other core system members (CNAAS and USAID/PCE) as the official manager of the index insurance program. PlaNet Guarantee thereby supervises and coordinates work of other actors in the program, including producer organizations and financial institutions for the sale of index insurance policies to farmers. Roles, responsibilities, and deliverables are defined in contracts among and between the key implementation actors.

Trainings, Sensitization, and Awareness Raising: Lead farmers from partner networks and agents from financial institutions were chosen (based on their involvement in previously existing contractual production financing schemes) to participate in Training of Trainers (ToT) workshops delivered by PlaNet Guarantee, and were trained on the index insurance product and marketing insurance contracts. After the trainings, an awareness-raising and marketing campaign was launched in the coverage zones using multiple communications and promotion strategies – including information sessions, T-shirt giveaways, flyers, and radio ads – to reach the widest possible rural demographics for insurance coverage. These outreach efforts also support efforts to inform clients and manage expectations.

Installation of Rainfall Gauge Network: Rainfall gauges that automatically collect data were purchased by USAID/PCE to track rainfall for the index insurance program. They were installed by ANACIM in compliance with the standards set by the World Meteorological Organization (WMO) and were secured by mesh fencing for protection from tampering or vandalism. One critical adjustment that was made to the USAID/PCE system since the initial pilot phase is the type of rain gauges used. The first generation network (those installed during the first two years) consists of 22 rain gauges that automatically collected (AC) rainfall data, but ANACIM technicians had to travel on-site to retrieve the logged data directly from each rain gauge. These rain gauges were supplemented by an additional 11 that were installed by the IFC/World Bank for its program promoting rain index insurance for peanut farmers. During the expansion of the index product package and coverage area in 2014, a second generation (Year 3 to present) of 19 automated rain gauges was added, each with a GPRS chip and a solar panel. These new gauges automatically collect and automatically transmit (ACAT) rainfall data to an operator based at ANACIM headquarters in Dakar. The full network of rain gauges (USAID/PCE Generation 1 and Generation 2 plus World Bank) provides an overall coverage of 3,795 km², with a radius of 5 km per rain gauge. The map on the following page shows the full network of rain gauges used for the program between 2012 and 2014, plus the sites identified for further expansion in 2015.

COVERAGE AREA OF INDEX INSURANCE PROGRAM FOR MAIZE, MILLET AND RAINFED RICE



Conception et réalisation : MNC
PCEUSAID Mars 2015

Sales of insurance premiums: A key strength of the USAID/PCE approach is the payment management structure. USAID/PCE seeks to build capacity and professionalism of farmers and farmers' organizations. This professionalism entails strengthened financial management skills to enable farmers to approach their agricultural production as a business, which entails assuming responsibility for costs and accountability for credit received. For this reason and in the interest of long-term sustainability of the system, it is important that farmers pay up front (in cash) for insurance premiums themselves. However, farmers who are unfamiliar with agricultural or index-based insurance services may be skeptical and hesitant to pay for something seemingly less tangible than their other production-related investments. Furthermore, many of the farmers working with USAID/PCE are smallholders, meaning they would likely not have the cash on hand at the beginning of the season to pay up front for their insurance coverage, even if they wanted to. This is why USAID/PCE worked with financial institutions to integrate payment of insurance premiums into the cashflow-based financing mechanism that was already underway with agricultural input and credit providers. Under this individual coverage model, farmers can use their seasonal production loans to pay for insurance along with their other inputs such as fertilizer, seeds, etc. In a second model, since some farmer groups manage their seasonal credit as a single entity, they have also incorporated the coordination of insurance coverage subscriptions as a whole network. For example, for maize insurance, FEPROMAS (*Fédération des Producteurs de Maïs du Saloum*) leadership managed insurance policy distribution within its network and negotiated agreements with financial institutions (PAMECAS, CNCAS, and UIMCEC) to include insurance premium costs in the breakdown of seasonal credit financings issued to the network as a whole.

In both scenarios, insurance is sold internally by the farmer networks to their members. Premium payments are coordinated by the network leadership and deposited in their account with CNAAS, who validates the subscriber list and communicates a subscription payment confirmation to PlaNet Guarantee which formalizes the policy. Following subscription confirmation, the insurance broker (PlaNet Guarantee) and the networks collect their commission payments, which is based on the volume of sales.

The cost of insurance premiums differs by zone and insured commodity and is based on a percentage of the total value insured. The variation is based on a number of factors that differ based on the commodity, location, and specific actors involved (and any applicable commissions collected). Reinsurers are responsible for pricing the overall risk based on data provided by index experts. They also ensure the proper management of underwriting and claim payouts. For example, the table below shows the breakdown of insurance premium costs for maize in 2014.

Breakdown of Maize Insurance Premiums for 2014 Season, courtesy of PlaNet Guarantee

		Nioro	Ndofane	Kaffrine	Koungheul	Kolda	Velingara
<i>Commercial Premium Total</i>		12.24%	17.69%	21.77%	21.77%	6.12%	8.20%
<i>Government Subsidy</i>		6.12%	8.84%	10.88%	10.88%	3.06%	4.10%
<i>Subsidized Premium Total</i>		6.12%	8.84%	10.88%	10.88%	3.06%	4.10%
<i>Maximum Capital Insured (CFA)</i>		666,000	474,923	385,875	385,875	1,372,000	1,023,881
<i>Network commission</i>	5.00%	0.61%	0.88%	1.09%	1.09%	0.31%	0.41%
<i>CNAAS commission</i>	5.00%	0.61%	0.88%	1.09%	1.09%	0.31%	0.41%
<i>Transfer costs</i>	3.00%	0.37%	0.53%	0.65%	0.65%	0.18%	0.25%
<i>CIMA control costs</i>	1.50%	0.18%	0.27%	0.33%	0.33%	0.09%	0.12%
<i>PG Commission</i>	12.00%	1.47%	2.12%	2.61%	2.61%	0.73%	0.98%
Total Load	26.50%	3.24%	4.69%	5.77%	5.77%	1.62%	2.17%
<i>Net Premium Reinsured</i>		9.00%	13.00%	16.00%	16.00%	4.50%	6.03%

Monitoring of the index: Monitoring the evolution of the index is done at the end of each phase by ANACIM, which analyzes the rainfall data received either directly from the automatic rain gauges or from on-site data retrieval (for first generation gauges). ANACIM sends PlaNet Guarantee their rainfall data, on which PlaNet Guarantee determines the loss calculation and compensation rate. Compensation is calculated according to the formula: $(\text{threshold} - \text{level of rainfall recorded}) / (\text{threshold} - \text{output level}) \times \text{sum insured per phase}$. This calculation is sent to CNAAS, which validates it and sends it to reinsurers (SwissRe, SenRe, NCARe) for final validation.

Payment of claims: At the end of each season, CNAAS holds a debriefing meeting where PlaNet Guarantee presents the rainfall results and compensation breakdown to farmers. After this meeting, CNAAS issues indemnity payments as necessary and based on the original premium payment method farmers had used. For instance, if premiums were purchased through seasonal credit, CNAAS issues the indemnity check in the name of the financial institution that granted the credit. The payment is made to the financial institution on behalf of the farmers' organization and the payments are applied directly to the credit accounts of the individual subscribers. In the event that the premium was paid directly by the farmers' network, CNAAS issues the check directly to the farmers' group, who settles the balances within their organization. If it had been an individual subscription, CNAAS pays directly to the person who purchased the premium.

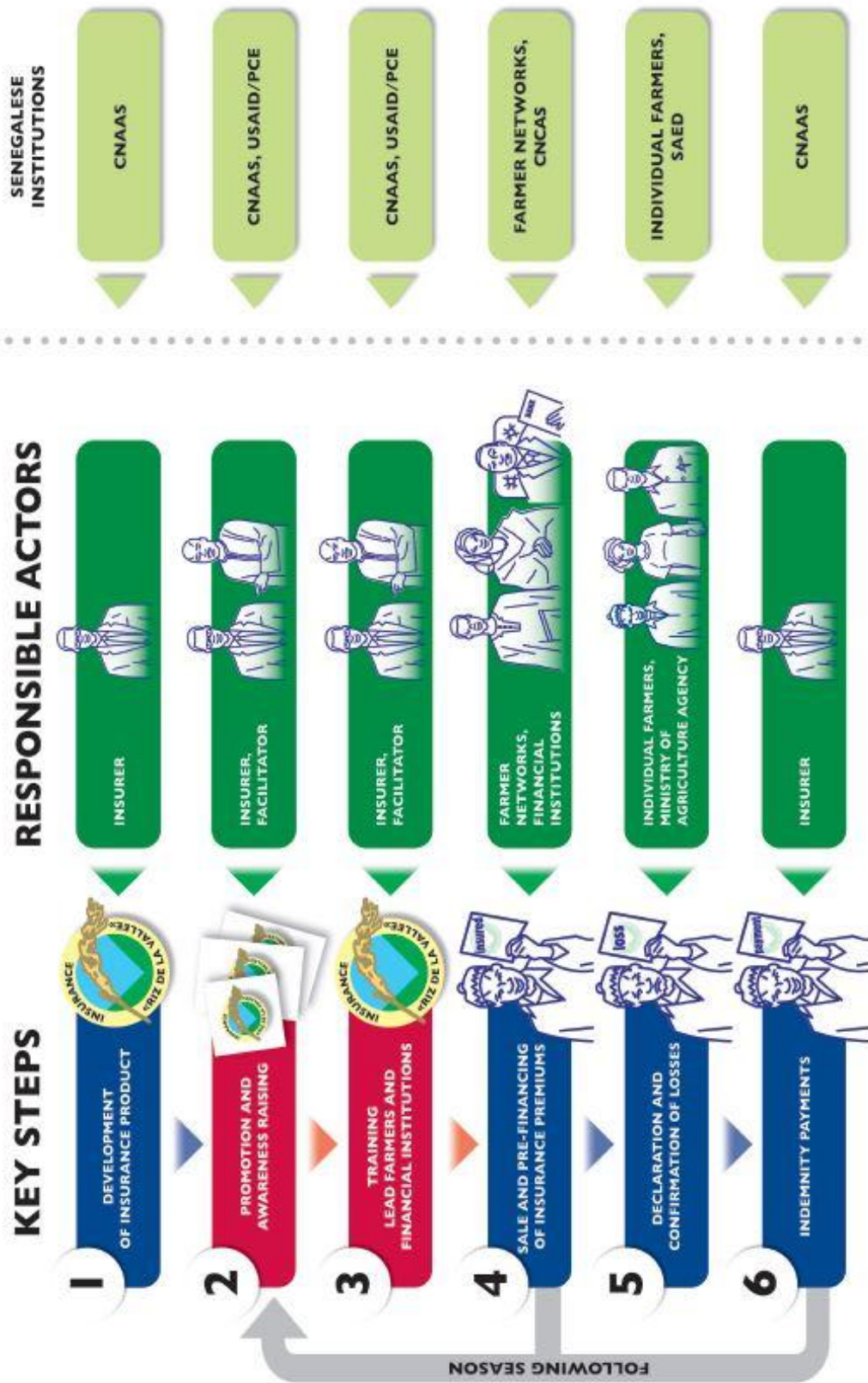
Determination of the following season's program: An annual report is produced by PlaNet Guarantee to present the results of the seasonal index, rainfall, triggers, and indemnities. The core management and facilitation team regroups with other implementation actors to define the scope and range for the upcoming season. It is at this time that the first steps are taken to recalibrate indices or launch a new feasibility study to extend the index insurance program, if decisions were made to do so. This may include purchasing and installing additional rain gauges and facilitating discussions with new producers groups or financial institutions. For 2015, the technical team consisting of ISRA, CIRAD, and PlaNet Guarantee have already finalized a new feasibility study and determined the index for an insurance product for rainfed rice areas in the Southern Forest Zone of Senegal, as shown on the map on page 6.

ADAPTING AND EXTENDING CROP INSURANCE FOR IRRIGATED RICE ZONES

In the interest of facilitating access to agricultural insurance for irrigated rice-producing partners in northern Senegal, USAID/PCE set out to support CNAAS in promoting its "*Riz de la Vallée*" crop insurance product, which was first introduced in the Senegal River Valley in 2012. The objective of the USAID/PCE-CNAAS collaboration was to lay the foundations for a long-term, ongoing partnership between financial institutions and farmers groups for the sustainable implementation and scaling of a model that would enable farmers to access and benefit from agricultural insurance by integrating seasonal production financing with insurance premium payments. This insurance program capitalizes on USAID/PCE's successful introduction of an integrated value chain financing model based on farmer-miller contracts and inventory collateral, which significantly improved the lending environment in the SRV and boosted production. The introduction of crop insurance reinforces the collateral position of small farmers and further reduces the lending risk for banks, paving the way for future growth.


USAID/PCE's support of the crop insurance system for irrigated rice was primarily accomplished through a critical awareness-raising program on agricultural insurance in the Senegal River Valley (SRV). The cornerstones of this program were: the organization of training workshops on agricultural insurance for financial institutions, farmers groups, and development partners; and the implementation of a mass communications campaign targeting water users associations in the region to promote the adoption of agricultural insurance as a production input linked to the seasonal credit cycle.

The diagram below details the steps taken following the start of USAID/PCE's partnership with CNAAS in 2013. The sequence of activities is presented with the role of each institutional actor and who assumed these roles. The activities in the system are presented in two categories: those driven by the design and facilitation support structure in red (CNAAS and USAID/PCE), and those driven by the core implementation group, in blue (financial institutions, farmer's groups, SAED, etc.).



Development of the Crop Insurance Product: The agricultural insurance promotion campaign in the SRV is centered on extending coverage to USAID/PCE "Riz de la Vallée" irrigated rice producer partners across the delta and the Senegal River valley. In addition to CNAAS, local financial institutions (CNCAS and more recently CEP and UIMCEC), SAED, and multiple local water-users associations were the main actors involved in the program. The multi-peril crop insurance product aims to offer subscribers compensation for crop losses upon the occurrence of one or more of the following: damages caused by grain-eating birds, damages caused by wild animals, and damages caused by floods caused by lakeside dam rupture or by off-season rains.

Awareness-raising and promotion of the product: A multi-faceted communications campaign was launched for water users associations in the region, particularly in the Department of Dagana, which is highly focused on commercial cropping. Various communication tools, including flyers and posters, were also developed for distribution to thousands of producers, and were posted and distributed in the offices of financial institutions. Additionally, radio ads in local languages were produced and disseminated to reach the greatest number of producers in rural communities. In addition, seven mass awareness-raising events were held for irrigated rice producer members of USAID/PCE partner water users associations, which also provided useful farmer feedback for CNAAS. Promotional materials (T-shirts, flyers, leaflets and large posters) were designed and used to spread the message. Large billboard ads were posted as well. The awareness-raising campaign has ultimately led to a broader awareness of CNAAS in general and of its insurance products, especially its "Riz de la Vallée" product.



ASSURANCE AGRICOLE RIZ DE LA VALLEE

Xoddiku bala ngaa lakkle!

J'assure ma récolte, je sécurise mes revenus

USAID DU PEUPLE AMERICAIN Programme de Sensibilisation sur L'Assurance Agricole dans la Vallée du Fleuve Sénégal CNAAS ASSURANCE AGRICOLE Tel: (0021) 33 666 78 00

Public billboard signage (seen here, left) was deployed in the areas covered by the campaign during January 2014. The message, accompanied by the illustration of birds attacking rice plots, translates to "it's better to be safe than sorry." The caption below reads: "I insure my harvest, I secure my income."

Trainings: Training activities led by CNAAS first involved CNCAS, though other financial institutions⁴ and development partners⁵ were included as well. Among the topics discussed during the training were (i) general information on agricultural insurance; (ii) principles of insurance products offered: operation, advantages, and disadvantages; (iii) insurance along the value chain sectors; (iv) legislative aspects: legal regulations, CIMA (Inter-African Conference on Insurance Markets) code; and (v) insurance, public policy, and subsidies.

Sales of Insurance Premiums: Premiums are purchased by producer organizations on behalf of their members and, in some cases, by certain financial institutions such as CNCAS as part of their seasonal production loan. To reinforce access to insurance (and increase loan amounts, which presents a win-win scenario for actors), CNCAS agreed to pre-finance the cost of premiums along with agricultural inputs. In this model, premiums are paid directly by the credit provider, which removes transactional delays from the process. However, before finalizing the sale, CNAAS provides a questionnaire to insurance subscribers and uses the responses to assess the total level of risk for the insurance policy. The questionnaire takes the following elements into consideration: Type and size of the producer organization; Rice seed variety used; Start date of sowing; End date of sowing; Area cultivated.

Insured values correspond to production costs and are estimated at 300,000 FCFA (or US\$600) per hectare maximum. The corresponding premium is around 20,000 FCFA (US\$40) per hectare, of which the Government of Senegal subsidizes 50%. As part of this arrangement, the insured farmer must apply all “best practices” recommended for irrigated rice cultivation in the Senegal River Valley, particularly the approaches promoted by SAED. Indemnity payments range from 84% to 100% of the total insured amount, depending on the month that the loss occurs.

Confirmation and Payment of Losses: CNAAS requires that policyholders follow an established protocol to secure their compensation in the event that eligible crop loss or damage occurs:

1. Report the loss, within five days, to the local SAED agricultural advisor⁶ through verbal and written communication (using a paper claim declaration form with confirmation receipt). The insured farmer must keep the confirmation receipt form, which will later serve as confirmation that the claim was filed.
2. Confirmation form and final loss estimate completed by the local SAED agricultural representative within five days of the claim. The claim form is transmitted to CNAAS for processing.
3. Claim is paid at the end of the season, following approval. Payment is made directly to the financial institution that granted the loan, except in the case of individual/independent subscriptions.

⁴ Crédit Mutuel du Sénégal (CMS), Alliance de Crédit et d'Épargne pour la Production (ACEP), Partenariat pour la Mobilisation de l'Épargne et du Crédit Au Sénégal (PAMECAS), Mutuelle d'Épargne et de crédit de la Fédération des groupements de femmes Productrices de la région de Saint-Louis (MEC FEPRODES), Union des Institutions Mutualistes Communautaires d'Épargne et de Crédit (UIMCEC) and the Atlantic Bank).

⁵ Bey Dundee Project, Société Nationale d'Aménagement et d'Exploitation des Terres du Delta du Fleuve (SAED), Direction Régionale du Développement Rural (DRDR), and Centres de Gestion et d'économie Rurale de la Vallée du Fleuve Sénégal (CGER)

⁶ CNAAS has a formal agreement with SAED to secure their support in the implementation of the program.

RESULTS AND LESSONS LEARNED

The table below shows the results of insurance subscriptions by number of policies paid, area insured, value of paid premiums and capital insured, and number and value of claims paid for rain seasons from 2012 through 2014 for both types of insurance.

Crop Insurance Results, 2012 through 2014									
	Rain Index Maize			Rain Index Millet	SRV Crop Insurance		Totals		
	2012	2013	2014	2014	2013	2014	2012	2013	2014
# Paid Policies	24	611	769	702	113	617	24	724	2,088
# Farmers Covered	24	611	769	702	1,695 ⁷	9,255 ⁸	24	2,306	10,726
Value of Paid Premiums (CFA)	478,000	9,672,884	14,287,755	3,980,317	67,749,466	142,337,000	478,000	77,422,350	160,605,072
Value of Capital Insured (CFA)	3,350,000	77,600,000	107,350,000	30,556,700	2,032,484,000	4,207,110,000	3,350,000	2,110,084,000	4,345,016,700
Area insured (Ha)	32	864	1,186	825	6,775	14,024	32	7,639	16,035
Number of Claims Paid	N/A	42	447	406	N/A	N/A	N/A	42	853
Value of Claims Paid	N/A	2,881,000	17,997,000	5,448,750	18,555,409	>17,648,315 ⁹	N/A	21,436,409	>41,094,065

The index insurance program was launched following a season where rainfall deficits left many farmers destitute and unable to repay their loans. The index was piloted in 2012 with just 24 small maize farmers in the department of Nioro for a cumulative 32 ha covered in the Saloum region. In the pilot year, the maize rain index had low results due to three main reasons: (i) the program was still relatively unknown; (ii) farmers were only given a one-week window to purchase premiums; and (iii) the sale of premiums was handled exclusively by the financial intermediary, ACEP, who had lingering tensions with farmers due to the poor repayment rates of the prior season. As a result, they withheld credit from some farmers seeking loans. In the second year of the program, subscription numbers grew from 24 in 2012 to 611 in 2013. Several factors explain this surge: (i) better preparation of farmers for the season including training of trainers (ii) the establishment of FEPMAS,¹⁰ which added significant numbers and an internally managed sale of premiums; and (iii) the involvement of new financial institutions (PAMECAS and U-IMCEC). By Year 3 of the program (2014), index insurance coverage has been extended throughout the Saloum to other central regions of Kaffrine and Fatick. Additionally, the index was confirmed for millet and extended to cover millet-producing villages in the Kaolack and Kaffine regions in 2014. For the first year of index

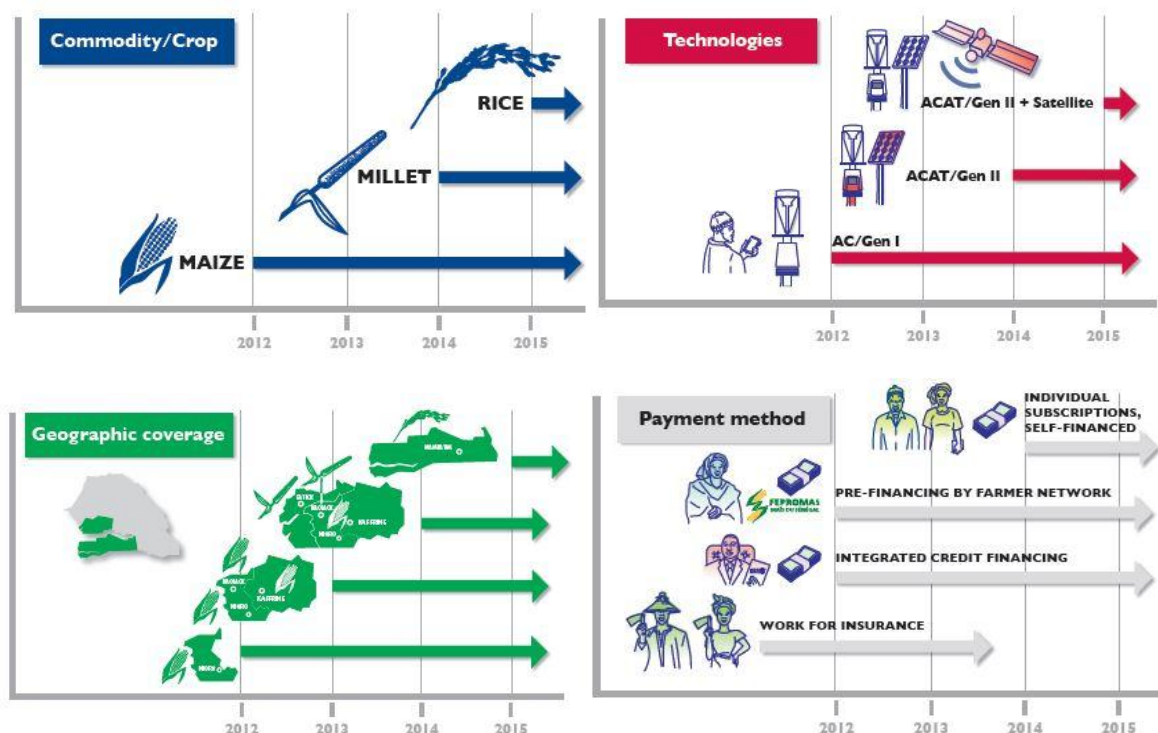
⁷ Because these are sold as network-wide coverage policies, these estimates are based on the average farmer network size of 15.

⁸ Because these are sold as network-wide coverage policies, these estimates are based on the average farmer network size of 15.

⁹ In the irrigated rice zone in Senegal, farmers run two crop cycles per year. Numbers listed for 2014 SRV Crop Insurance include only one of these cycles, the "rain season." Numbers for the second 2014 cycle ("dry off-season" or "contre saison chaude") are not yet available. Based on the close proximity of the 2013 total (which includes the rain season and CSC) and the 2014 rain season numbers, it is clear that the 2014 total is set to increase significantly once CSC numbers are added.

¹⁰ FEPMAS, or the Federation of Maize Producers in the Saloum, is an enterprise encompassing 31 farmers' organizations from 19 rural communities in the departments of Kaolack, Nioro, and Kounghoul. FEPMAS was formed by USAID/PCE partner networks wishing to consolidate and restructure their management for greater leverage negotiating seasonal credit, inputs, standardization of quality, and sales.

insurance coverage for millet, 702 producers were covered, having paid a total of 3,980,317 FCFA (US\$7,960) to cover an area of 825 ha, valued at 30,556,700 FCFA (or US\$61,113). Beneficiary involvement has evolved to the extent that FEPROMAS and millet producer networks will systematically pre-finance insurance premiums for their members even before seasonal credit has been disbursed. For the fourth year (2015), a pilot for rainfed rice index insurance is underway in the Mampatim department of Kolda in southern Senegal, to test and calibrate the index that was developed following a feasibility study for the new product. The diagram below outlines the evolution of scaling the index insurance program in rainfed zones across Senegal described above along four axes: product covered, monitoring technology, geographic reach, and payment approach.



Conventional Crop Insurance in the SRV has now become a central component of loan applications submitted to financial institutions, even though it is not a binding requirement. This demonstrates that farmers have come to realize that holding crop insurance coverage makes their applications stronger as it reduces lender risk.

The training and awareness program led to enrollment of the greatest amount of subscribers to the "Riz de la Vallée" insurance product since its launch in 2012, and with the continued efforts of CNCAS and CNAAS, agricultural insurance is becoming widespread across the SRV. More than 3,000 rural stakeholders were reached through the initial awareness-raising campaign. The awareness-raising events also gave CNAAS the opportunity to receive recommendations from potential subscribers, most notably for extending the coverage (to a greater number of risks, to the full cost of production, to a longer cropping period and to cover rupture of large dams, dykes, and levees). Feedback received from farmers included requests to increase the maximum insured value to 450,000 CFA per hectare, which would cover all production costs, including those above the amount covered by bank credit.

There are notable advantages and disadvantages of each of the insurance approaches.

For index insurance, the low administrative costs, lack of hazard risk of field-level agents, and quick and broad confirmation of losses are three core benefits that enhance the approach's ability to quickly scale on multiple axes (e.g. products, geography, etc.). In addition to the quick and broad confirmation of losses (where loss confirmation does not require on-site loss verification by field technicians such as for conventional insurance), this approach is also clear, transparent, and has a lower vulnerability to human error or corruption (particularly with the second generation rain gauges that automatically collect and transmit rainfall data). However, the rain gauge-based index insurance system does not account for localized risks such as damages to rain gauges (in 2014 an ACAT rain gauge was broken and the solar panel stolen). Maintenance and daily transmission and processing of data also leads to relatively high data collection costs.

The cost of premiums is another constant area of concern for farmers. The government subsidy and exclusion from insurance tax is a significant contribution to keeping insurance accessible to farmers currently, but an additional area of inquiry is whether it is possible to track the financial sustainability level achieved by the insurance system itself, and whether there is a scale at which the premiums can be reduced sufficiently without subsidy or external support. Though USAID/PCE has engaged in discussion with partners around this topic, it is clear that there are proprietary cost details at the level of different private actors that make such an assessment complex and challenging. It is nevertheless recommended to incorporate sustainability and scale targets into agricultural insurance systems, particularly those promoted to enhance food security programming.

Furthermore, although integrating the payment of premiums with seasonal production loans represents an ideal arrangement for farmers, it also implies additional complications that can even exclude farmers from coverage. For instance, in the second year of the maize program, 90 farmers that were being financed by the financial intermediary, CMS, had to be removed from the insurance policy because they had not received their seasonal credit, and therefore couldn't pay for their premiums. The case of FEPROMAS and millet producing groups has offered a response to this issue, in the pre-financing of premium payments (which they reimburse internally when the seasonal credit funds are received).

Active involvement of stakeholders, including financial institutions, farmers groups, and other institutional structures has overall led to a stronger and more sustainable system in both insurance cases. The management contracts that are signed at the beginning of each season reinforce the collaboration and accountability of actors. Meanwhile, third party data management ensures transparent and reliable data and a fair distribution of benefits.

Aligning data and payment systems for multi-dimensional expansion: Supplementing data with readings from weather stations and satellite data could also allow for larger area coverage. As mentioned above, actors also recognize the great opportunity that exists to link the rain gauge index product system with satellite-based index insurance programs in the country to provide a stronger, unified agricultural insurance package to a broader geographical and socio-economic breadth of farmers. The work for insurance program currently run by the World Food Program (WFP) would be an ideal partner with the PlaNet Guarantee driven system, where farmers graduate from receiving free insurance (in exchange for community labor) to paying for insurance through seasonal credit (which has ensured pre-financing through an umbrella network such as FEPROMAS). The next level of this trajectory is emerging in the irrigated rice zone (but is nevertheless applicable for the index-based products) where industrial

mills who have contracted purchase orders with farmer networks will pay to cover the fields of producers under contract.

The adaptive and iterative implementation cycle with timely and regular collaboration with other actors is paramount to the success of the system. Review of insurance results at farmer debriefings has proven to be not only an essential component of the transparency of the system but also a promotional tool. Insured and uninsured farmers are present and discussions on reimbursements and value of reducing seasonal risk has contributed to the fast uptake of insurance purchases by farmers networks. Next steps for CNAAS should include the organization of annual review meetings to allow producers to share their opinions and give feedback on the products, and for CNAAS to make adjustments based on these. Ultimately, the goal is to offer a product that has a protective capacity that is adequately adjusted so that all stakeholders maximize their benefits, including insurers and insured farmers.

The critical role of marketing and awareness-raising was clearly highlighted in the case of crop insurance in the north, where, although PCE wasn't involved in the development of the product, it had a significant impact on marketing and access. Additional support for CNAAS in developing a medium- and long-term communication strategy for northern regions (Podor and Matam and the department of Bakel) would also enable further expansion of the successful product.

Farmers' perception of insurance as another necessary production input for the start of each agricultural season represents a significant shift for the adoption of this instrument and expansion of insurance markets. Furthermore, it has represented an opportunity to further reinforce the management capacity of farmer group leadership teams to professionally manage the sensitization, sales, and reimbursement of insurance premiums in a streamlined and efficient way. Further work can be done nationally with financial institutions, government institutions, CNAAS, farmers' organizations, and development partners to explore ways and means to systematize the payment of agricultural insurance premiums for all production credit applicants (and to reduce insurance premium costs). In the SRV, it will be key moving forward to promote and support the involvement of additional financial institutions, since to date CNCAS is the only credit institution practicing the integrated financial model for seasonal production credit and crop insurance.

Continued support for creation and strengthening of farmers' organizations will be paramount to the management of short-, medium-, and long-term risk for farmers and financial institutions. The approach underway in Senegal highly involves farmers' organizations in the process of creating, validating, training, promoting, selling, financing, and distributing benefits from traditional and index-based insurance products.

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