



# FEED THE FUTURE

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



Collaborative Research  
on Sorghum and Millet

# 2022 ANNUAL REVIEW MEETING

March 21-25, 2022

*Virtual*



**USAID**  
FROM THE AMERICAN PEOPLE

**KANSAS STATE**  
UNIVERSITY



**Collaborative Research  
on Sorghum and Millet**

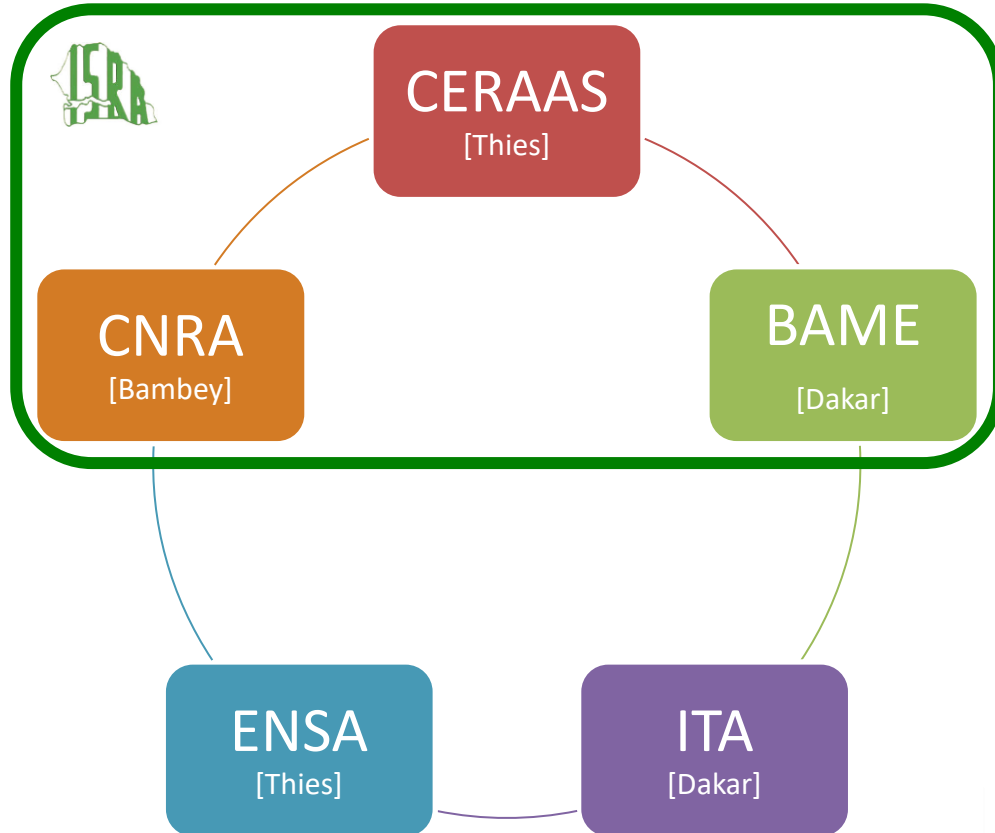
# **SMIL target country presentations: Senegal**

**Ndjido A. Kane**

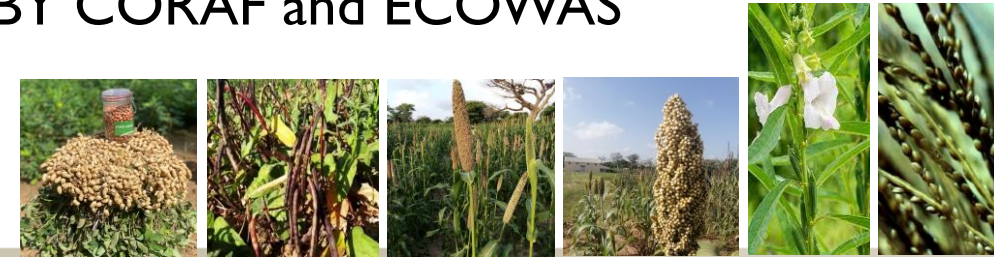
**SMIL Senegal National Coordinator**



## The Regional Center of Excellence for Dry Cereals



- >DEMAND-LED RESEARCH & EDUCATION
- >VALUE CHAIN APPROACH 
- >MANDATE – WEST & CENTRAL AFRICA / DRY CEREALS AND ASSOCIATED CROPS
- >ENDORSED BY CORAF and ECOWAS



# SMIL Projects in Senegal

## GENMIL

- Genetic Enhancement of Pearl Millet for Yield, Biotic and Abiotic Stress Tolerance in West Africa
- PI – Ndjido A. Kane (ISRA/CERAAS); Co-PI – Ghislain Kanfany (ISRA/CERAAS)

## SMIL-DIGEST

- Sorghum Trait Deployment Pipeline for Improved Food and Feed Value
- Co-PI – Elisabeth Diatta-Holgate (ISRA/CERAAS), Cyril Diatta (ISRA/CNRA)

## SAWAGEN

- Improving Sorghum Adaptation in West Africa with a Genomics-Enabled Breeding Network
- Co-PI – Bassirou Sine (ISRA/CERAAS), Cyril Diatta (ISRA/CNRA)

## SMIL-PATHO

- Enabling Marker Assisted Selection for Sorghum Disease Resistance in Senegal and Niger
- Co-PI – Mame Penda Sarr Diawara (ISRA/CNRA)

## SMIL-NUTRI

- Expanding Markets for Sorghum and Millet Farmers in West Africa Through Strengthening of Women and Youth Processors and Nutrition-based Promotion of Products
- Co-PI – Cheikh Ndiaye (ITA)

# From Technology Generation to Delivery

Traits, Tools  
Markers, Pops.

- \*Demedanded attributes (Agro & Qlty)
- \*Modern/advanced approaches

Improved  
varieties &  
Management

- \*High yielding & Nutritious varieties
- \*Well adapted (short to long duration, drought tolerant, disease resistant, etc.)
- \*Affordable & labor saving mgt options

Food & Feed  
Products

- \*Palatable (sensory tests)
- \*High organoleptic qlty & nutritional value
- \*Good shelf life & attractive packaging

**RESEARCH / TRAINING**

**PRODUCTION / PROCESSING**

**CONSUMPTION / MARKET**

# SMIL-Senegal's Products that are in Phase 3

Crop	Product line	Use	Potential Users
Sorghum	Tannin-free sorghum resistant to grain mold (5 Mini-NAM lines: ISRA-S-692-269 /-300-1 /-300-2 /-319 /-400). Score <b>2</b> (1-10% grains molded)	Grain & Fodder	Seed dealers, Producers, Food processors, Consumers, Livestock Farmers
	Highly digestible sorghum grain proteins (5 advanced lines: ISRA-S-745-1 /-2 /-55 /-38 /-113. Up to <b>26%</b> more digestible proteins	Grain & Fodder	Agri-industry (baking, poultry and livestock feeds)
Pearl Millet	High yielding, Late maturing OPV (Salam) GYP: <b>2.5 to 3 t ha<sup>-1</sup></b> , <b>120</b> days	Grain	Seed dealers, Producers, Food processors, Consumers

For each product line, the best 3 sorghum lines, based on cooking qualities and consumers' preferences, will be proposed for release by the end of 2022.

# SMIL-Senegal's Products that are in Phase 4

Cat.	Product line	Use	Potential Users
<b>Sorghum</b>	Dual-purpose high yielding varieties. GYP: <b>3 to 3.5 t ha<sup>-1</sup></b> (Payenne, Golobé, Faourou, Darou, Nganda, Nguinthe)	Grain & Fodder	Seed dealers, Producers, Food processors, Consumers, Livestock farmers
<b>Pearl millet</b>	High yielding, medium duration OPVs (Souna Baol-SL 423, Souna Sine-SL 169, Souna Saloum-SL 28, Thialack 2) GYP: <b>2.5 to 3 t ha<sup>-1</sup></b> , <b>90 to 105</b> days, up to <b>50%</b> more fodder (SL series)	Grain & Fodder	
	High yielding, early maturing OPVs (Gawane, GB 8735, Chackti). GYP: <b>3 t ha<sup>-1</sup></b> , <b>65 to 85</b> days, <b>38%</b> more Fe	Grain	Seed dealers, Producers, Food processors, Consumers
	Early maturing, high yielding hybrid (TAAW). GYP: <b>3-4 t ha<sup>-1</sup></b> , <b>70-80</b> days	Grain	
<b>Food Tech.</b>	<ul style="list-style-type: none"> <li>•Bread and pasta made with local cereal grains (15-30% admixed)</li> <li>•Enhanced process of rolled flours (arraw, degue, etc.)</li> <li>•Malt flours for various preparations</li> <li>•Fortified (Fe, Zn, Vit-A) precooked/instant flours</li> </ul>	Food products	Food processors, Consumers, SMEs, Agri-industry
	Local Lactobacillus strain cultures	Fermentation	Food processors, SMEs, Agri-industry



## Variety/Seed Scaling Approaches

### Open field days - Showcasing

On station through iREACH Tech Park, and projects (e.g. PAIRED)

On farm demonstrations and field visits by neighboring farmers (e.g. PMP)

### Benefiting from contractual farming

Large processing companies (e.g. Mamelles Jaboot, La Vivrière) enter into agreement with producers, some of which use our varieties.





## Decentralized seed production – Community Based seed System (CBS)

Builds on a large network of Farmer Organizations already involved in the participatory evaluation our new varieties & seed production.



# Food Products Scaling Approaches

## Tech transfer to processing companies

- Fast cooking *array* made of germinated flour transferred to **Free Work Services** and **La Vivrière**.
- **Mamelles Jaboot** is showing interest in tannin-free and high nutrition value sorghum.
- Following distribution in Kaolack, the **Malnutrition Control Unit (CLM)** made large orders of fortified instant flours.

## Incubating youth & women-led processing businesses (AfDB)

- Knowledge and technology transfer to agribusiness owners and start ups.
- Construction of the incubator will be completed this year.
- Cereal-based food products developed by ITA are being promoted through this channel.

## School Canteens Program (WFP)

The women processors association (*Plateforme Nationale Deugg Mo Wor*) – 16,000 members across the country, is involved in this program.

Pearl millet grains are supplied directly by producers incl. from FOs working with ISRA and ITA.

## Trendy and innovative pearl millet-/ sorghum-based recipes

Pearl millet/Sorghum substituted to rice in various recipes and several women trained.

More “modern” bites (e.g. millet-based mini pizza, sorghum cupcakes, etc.).

Next step: industry take up, commercialization.





# Animal Feed Products Scaling Approaches

## **COLLABORATION WITH ISRA/CRZ & ENSA (SIIL)**

Study sorghum as a substitute to maize in poultry feeds.

Produce quality fodder from dual-purpose pearl millet/sorghum varieties for cattle feeds.

## **UPTAKE BY THE PRIVATE SECTOR (being explored)**

Large Companies – NMA, SEDIMA

Livestock farmers – Individuals or FOs

### **Additional research is needed:**

- > To establish/prove the beneficial effects of these new products on livestock.
- > To come up with commercial products that can be scaled by animal feed industries.

## Other Synergies Leveraged

- ILCI /CIWA & CASSI (Crop improvement, Gender, Youth, Nutrition & Seed Systems)
- SIIL (Intensification options for dual-purpose pearl millet varieties)
- FPIL (Processing, New products development & Market)
- All ILs (Cross cutting themes and Indicators)
- USAID /PAIRED (Variety scaling)
- DESIRA /ABEE (Modern & demand-led breeding approaches)
- IBP-IFAD /EBCA (Digitized breeding programs)
- AFDB/TAAT (Technology scaling)

## Scaling & Monitoring through Digital Platforms

The following companies/organizations are being considered

### JOKALANTE SARL

Call center > information access



**+80000**

contacts gérés

**+8000**

femmes

**+5**

langues locales

**+130000**

feedbacks reçus

**+25**

enquêtes réalisées

**+250000**

messages vocaux  
envoyés



Information access & Market place



**29697**  
**0**

Nombre d'utilisateurs  
enrôlés



**69**  
Le nombre d'OP



**48494**  
**2**

le nombre de push SMS  
envoyé



**9999+**  
Le nombre de villages  
touchés

### ANCAR/FAO (SAIDA App)

Ag advisory services



Pilot phase: 85,000 farmers  
300 villages



## Product Promotion to Enhance Private Sector Interest

The idea of a **business opportunity fair** was discussed following Nathanael Bascom's visit to Senegal in Feb 2022 and debriefing with USAID mission in Senegal.

Good opportunity to:

- >Raise awareness about the new varieties, food products and other technologies.
- >Showcase products that may be picked up by SMEs and large companies.
- >Enhance demand/market pull and help grow markets for farmers and processors.

## Further Support Needed

To keep providing relevant and innovative technologies in the face of climate change, and food and nutrition insecurity.

- >Enhanced capacities for disease screening, marker discovery/use and food science & technology
- >Train technicians on new breeding schemes and advanced experimental methods as well as women/youth entrepreneurs on technology use and business development

To further disseminate pearl millet/sorghum varieties and derived products.

- >Seed multiplication of preferred varieties to support dissemination and to respond to demand
- >Stronger and more linkages with food processors & Agri-industry

## To foster behavioral change and make pearl millet and sorghum hype again.

- >Powerful marketing, promotion & delivery at scale – funding for demand in addition to supply
- >Tasty and affordable recipes combined with attractive packaging of food products
- >Well-paid jobs and business opportunities in pearl millet and sorghum value chains

## To measure adoption & impact generated using products funded by SMIL.

- >Build evidence to support advocacy and guided policy.
- >Better understanding of value chain actors' limitations in accessing new technologies, knowing what is available, their cost, and where to find them.



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**Thank you for  
your attention**

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[www.feedthefuture.gov](http://www.feedthefuture.gov)



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