2022 ANNUAL REVIEW MEETING

March 21-25, 2022

Virtual
SMIL target country presentations:
Senegal

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

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

**SMIL-PATHO**
- 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)

**SMIL-NUTRI**
- Sorghum Trait Deployment Pipeline for Improved Food and Feed Value
- Co-PI – Elisabeth Diatta-Holgate (ISRA/CERAAS), Cyril Diatta (ISRA/CNRA)
From Technology Generation to Delivery

Traits, Tools, Markers, Pops.

- Demanded attributes (Agro & Qty)
- 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 qty & nutritional value
- Good shelf life & attractive packaging

TECHNOLOGIES

RESEARCH / TRAINING

PRODUCTION / PROCESSING

CONSUMPTION / MARKET
SMIL-Senegal’s Products that are in Phase 3

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

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

<table>
<thead>
<tr>
<th>Cat.</th>
<th>Product line</th>
<th>Use</th>
<th>Potential Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sorghum</td>
<td>Dual-purpose high yielding varieties. GYP: 3 to 3.5 t ha(^{-1}) (Payenne, Golobé, Faourou, Darou, Nganda, Nguinthe)</td>
<td>Grain &amp; Fodder</td>
<td>Seed dealers, Producers, Food processors, Consumers, Livestock farmers</td>
</tr>
<tr>
<td>Pearl millet</td>
<td>High yielding, medium duration OPVs (Souna Baol-SL 423, Souna Sine-SL 169, Souna Saloum-SL 28, Thialack 2) GYP: 2.5 to 3 t ha(^{-1}), 90 to 105 days, up to 50% more fodder (SL series)</td>
<td>Grain &amp; Fodder</td>
<td>Seed dealers, Producers, Food processors, Consumers, Livestock farmers</td>
</tr>
<tr>
<td></td>
<td>High yielding, early maturing OPVs (Gawane, GB 8735, Chackti). GYP: 3 t ha(^{-1}), 65 to 85 days, 38% more Fe</td>
<td>Grain</td>
<td>Seed dealers, Producers, Food processors, Consumers</td>
</tr>
<tr>
<td></td>
<td>Early maturing, high yielding hybrid (TAAW). GYP: 3-4 t ha(^{-1}), 70-80 days</td>
<td>Grain</td>
<td>Seed dealers, Producers, Food processors, Consumers</td>
</tr>
<tr>
<td>Food Tech.</td>
<td>• Bread and pasta made with local cereal grains (15-30% admixed)</td>
<td>Food products</td>
<td>Food processors, Consumers, SMEs, Agri-industry</td>
</tr>
<tr>
<td></td>
<td>• Enhanced process of rolled flours (arrow, degue, etc.)</td>
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<td>• Malt flours for various preparations</td>
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<td></td>
<td>• Fortified (Fe, Zn, Vit-A) precooked/instant flours</td>
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<tr>
<td></td>
<td>Local Lactobacillus strain cultures</td>
<td>Fermentation</td>
<td>Food processors, SMEs, Agri-industry</td>
</tr>
</tbody>
</table>
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.

Breeder Seeds (G1-G3)
- On station by the responsible breeders & the dedicated unit (UPSEM/CL, Bambey)

Foundation Seeds (G4)
- On farm by selected lead producers
  *Training and quality control by breeders and qualified gvt. agents

Certified Seeds (R1)
- On farm by selected lead producers
  *Certification by qualified gvt. agents
Food Products Scaling Approaches

**Tech transfer to processing companies**

- Fast cooking *arraw* 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
- +1300000 feedbacks reçus
- +25 enquêtes réalisées
- +2500000 messages vocaux envoyés

**ANCAR/FAO (SAIDA App)**
Ag advisory services

Information access & Market place

- MLouma

Pilot phase: 85,000 farmers
- 300 villages
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

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

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