

## Factsheet final findings Applied Research Fund Call 3



### Developing economically viable foundation seed production models for crops vital to food security in Mali

#### Summary

In Mali, smallholder farmers are generally not involved in foundation seed production which is dominated by the conventional public sector based models. During two years, the project conducted field experiments to test three models of foundation seed production: Research Institutions Model – RIM, Seed Companies Model – SCM, and Smallholder Farmers Model – SFM. The objective was to develop foundation seed production models inclusive of female and male smallholder farmers. Three research questions were the targets of the project: (i) Can smallholder farmers produce foundation seed under the formal seed system? (ii) What is the efficiency (yield, volume, costs, quality, and sustainability) of smallholder farmers centered models of foundation seed production as compared with breeder or seed companies centered models? (iii) Is smallholder farmers' involvement in foundation seed production worthwhile in terms of return from investment compared to other models? A single variety of five crops that are vital to food security (rice, millet, sorghum, groundnut, and cowpea) was used in a randomized complete block design with 3 replicates. The quantitative (agronomic), qualitative and economic performances of the three models were assessed. The qualitative assessment looked at the failure or success of the seed produced by each model to pass the formal certification process. The two year data were used in a combined analysis considering models and crops as fixed variables. The results will be shared with all the stakeholders and the best performing models promoted as a means to increase the availability of foundation seed of food security crops in Mali.

#### Final research findings

- Significant differences were detected between models for agronomic data ( $P \leq 0.05$ ).
- In overall, SFM recorded the largest seed quantity and the largest seed yield but it was significantly different only from RIM.
- None of the models could realize the yield potential of the rice variety used in the experiment; the yield gap ranged from 44-81%.
- Smallholder farmers outperformed the yield potential of the millet and sorghum variety used by 112% and 102% respectively.
- Foundation seed of millet, sorghum and cowpea successfully passed the formal seed certification process, even for the seed produced by the SFM.
- There was a serious quality issue with rice and groundnut seed, which was found by each of the three models tested.
- The net margin ranged from US -\$51 (for RIM rice) to US \$5530 (for SFM millet).
- SFM realized the highest net margin for cereals while the SCM performed best for groundnut. However the SFM cannot sell their rice and groundnut since these seeds did not pass the process of certification.
- RIM realized the highest net margin for cowpea (US \$3953).

#### Outcomes achieved

In Mali, groundnut is produced and processed mainly by women. Women grow groundnut for household consumption and commercialization. They process it into butter which is used in various recipes to make stew that accompanies the main dishes. Although women are involved in groundnut production, processing and marketing, they were not involved in foundation seed production. For the first time in Mali, through this project, women are involved in foundation seed production. The project strengthened a group of 69 women from

Monzoblenna village in groundnut seed production and marketing as income generating activity and to supply their group members with quality seed. In year 1 of the project, the group produced 670 kg of groundnut seed on 0.75 ha that was rejected at certification. In the second year, through the trainings and technical backstopping provided by the project, the group produced 1050 kg of foundation seed on the same acreage. This seed was successfully certified and worth US \$2692.30. The success of these women in groundnut seed production led them to acquire an Agro Processing Enterprise Center (APEC) funded by the Sasakawa Africa Association (80%) and at 20% by the women group. The women group contributed in nature by providing the hosting infrastructure. The APEC is equipped with a groundnut roaster and grinder. Four women and two men were trained on machine operation, basic maintenance, repair and safety.

### Project messages to

#### A) Actors from private sector:

- Private sector seed companies' model outperformed the yield potential of the groundnut variety used in the experiment by 127%. This model also made the highest return from investment for groundnut. Unfortunately, their groundnut seed could not be marketed as a result of poor seed quality related to genetic purity. To exploit this potential, seed companies must overcome the challenge related to groundnut seed quality.

#### B) Civil society and practitioners organizations:

- The project created awareness of stakeholders on the profitability aspects of the investments in seed production and marketing for smallholder farmers. Therefore farmer organizations, NGOs and development partners must mobilize resources to build capacity of farmers to record data and monitor the profitability parameters regularly to make informed decision about their businesses.

#### C) Policy makers:

- Support and promote the production of foundation seed by smallholder farmers.
- Identify potential seed production niches in the country in terms of crop, farmer, company, or research institution and / or locality, and strengthen the niche approach to establish specialized seed production excellence centres in the country.
- Promote synergy between the various models proposed by the project.
- Increase the number of producers at the level of each crop and models.

### Knowledge products

*Sasakawa Africa Association – Voices from the fields*

- ["This foundation seed project has been an opportunity to improve our living conditions"](#) (August 2019)
- ["This is a new type of market that we did not know before SG 2000"](#) (June 2019)
- [Malian National Director of Agriculture 'Very Satisfied' with SAA Interventions](#) (March 2019)
- [Supporting farmers to produce quality seed](#) (December 2018)

### Knowledge networks

A knowledge network was put in place for this project and consisted of research institutions in Mali (Institute of Rural Economy), in the Netherlands (Royal Tropical Institute – KIT); Malian universities (Rural Polytechnic Institute of Training and Applied Research – IPR/IFRA), agricultural extension and advisory services organization (Sasakawa Africa Association); farmers from the Production Postharvest and Trade Centers (PHTC) of Monzoblenna Dacoumani and Siranikoto; and seed companies (Camara Semences and Faso Kaba). The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) which is a network of 113 universities provides technical support to the network.

### Co-creation

Following site visits and the project inception workshop all stakeholders along the seed value-chain (private sector, universities, research institutions, and government actors) got engaged in the process of co-creation. Government actors were engaged for seed quality control and certification. In addition, the Ministry of Agriculture not only visited the seed production fields, but also chaired the project inception and closing workshops during which they participated to the discussions and accessed useful information generated by the projects for policy updates. All other actors were responsible for providing the required land areas and for conducting the field experiments, data assessment and reporting. In return, they benefited from the project by enhancing their technical expertise, and by acquiring the resulting foundation seed. Research institutions and universities benefited from the project by contributing to the publications. Further, the project promoted five new rice varieties released by the research institutions. Additional benefits for the universities were the internships provided to five students for field research. Few issues were raised by partners although they did not prevent the implementation of project activities: (i) The private sector actors wanted to implement more tests using more crops and varieties which the project could not afford. (ii) The research institutions wanted to produce foundation seed of multiple varieties for a given crop which was difficult to implement due to the distance requirements between fields of different varieties for certain crops and also budget limitation.

### Consortium partners

- [Sasakawa Global \(2000\)](#)
- [Royal Tropical Institute \(KIT\)](#)
- [Polytechnique Rural Institute of Training and Applied Research \(IPR/IFRA\)](#)

### Contact person

Dr Sokona DAGNOKO  
[sokona@saa-safe.org](mailto:sokona@saa-safe.org)  
[sokona.dagnoko@gmail.com](mailto:sokona.dagnoko@gmail.com)

### Project website

[F&BKP Research Project page](#)