APSAN-Mali: Enhancing crop productivity and climate resilience for Food and Nutrition Security in Mali

Project objectives

The global objective of the project is to contribute to sustainably increasing crop productivity and farmers' income in the context of climate change. Thus, the project specifically aims at: (1) increasing agricultural productivity in the face of population growth and climate change through the promotion of varieties developed under previous projects, (2) improving resilience of smallholder farmers to climate change and economic vulnerability through an innovative demand-driven and modern breeding schemes, (3) achieving more efficiently exchanges of genetic material and data at the regional scale, and (4) sustainably strengthening research teams in crop improvement.

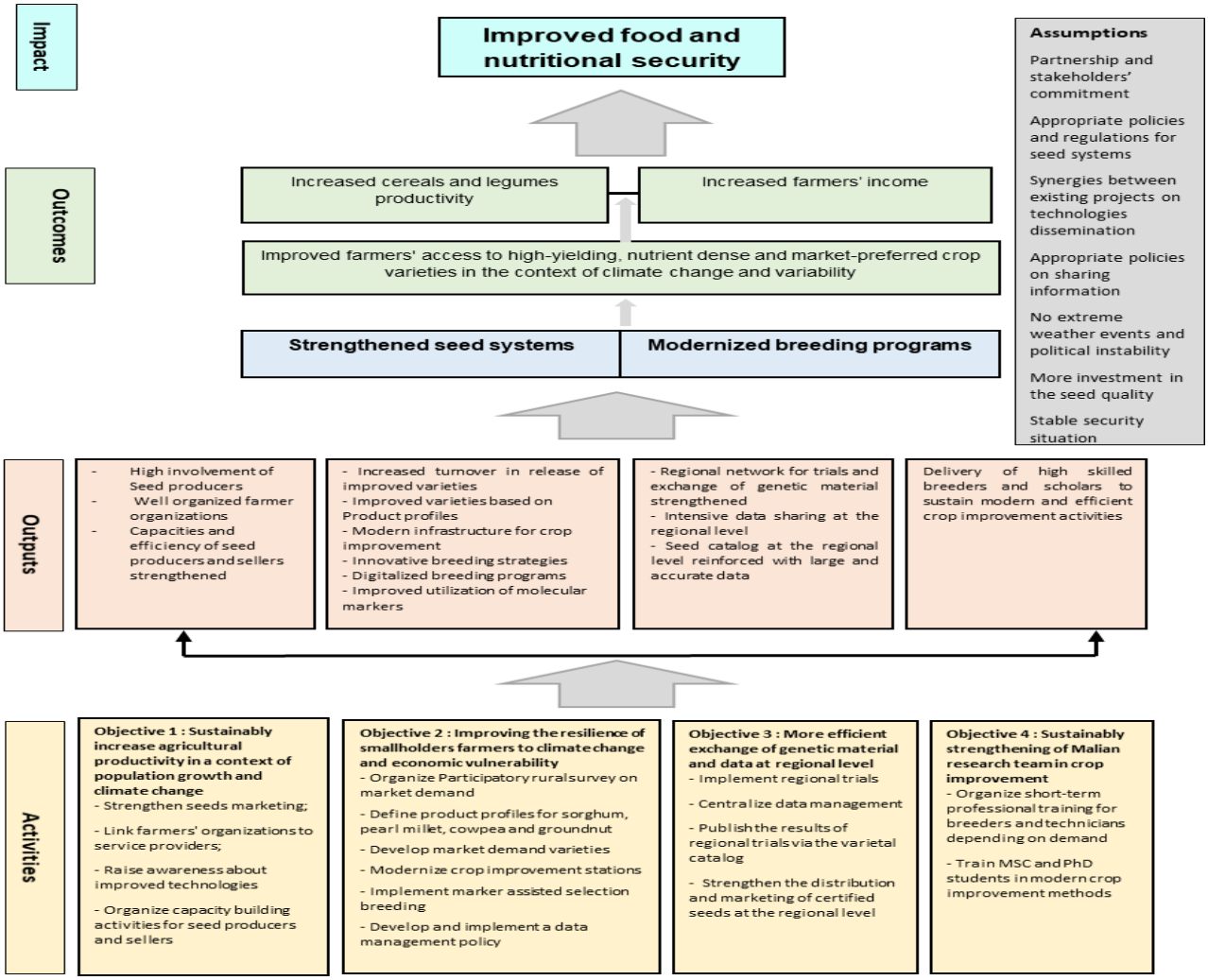
Background

In Mali, the agriculture sector employs a large proportion of the population and contributes to about 42% to the Gross Domestic Product. Despite its importance, this sector is challenged by low grain yields of main crops resulting in food deficits due particularly to climate change and variability, biotic and abiotic stresses and poor access of farmers to improved technologies such as high-yielding varieties. The targeted environment is also characterized by a weak formal seed system and inefficient conventional methods in breeding programs, which are relying on poorly equipped technical platforms leading to a slow replacement of the old varieties in the context of climate change. Therefore, investment in the modernization of crop improvement is essential to respond to market signals and take advantage of technological advances that allow being more effective in developing resilient crops adapted to local environments and needs. In addition, there is a great potential of opportunities in the agri-food and seed production technologies that can create jobs and provide supplementary benefits to the seed companies and farmers' organizations around high yielding varieties. Facing these challenges, the APSAN project aims at improving the productivity of crops such as sorghum, pearl millet, groundnut and cowpea through modernizing crop improvement programs and strengthening of seed systems, technology transfer and market access.

The Theory of Change to achieve the objectives

The APSAN project aims to improve food and nutrition security through the increase in cereals and legumes productivity and farmers' income. It is focused on a results-based framework using complementary approaches ensuring the impact pathways, effectively leading to the achievement of the targeted results.

Figure 1: The Theory of Change (ToC) of the APSAN-Mali project



A first set of activities concerns the promotion of varieties developed under previous projects and now ready for commercial uses as per the Economic Community of West African States (ECOWAS) rules. This promotion integrates as well good agronomic practices and is done through awareness creation (demonstrations plots, field days, rural radios, etc.). The activities also include the strengthening of seed systems and the linkage of farmers to inputs suppliers (improved seed and fertilizer).

A second set of activities is focused on the modernization of sorghum, pearl millet, groundnut and cowpea improvement programs through a demand driven approach and the use of modern tools. The market demands is assessed and the outputs are being used to define the main products requested. This step is followed by the development of climate resilient and nutrient dense cultivars with the specific needs of farmers/market in the targeted zones. All these activities are realized through a participatory approach and an effective public-private partnership with farmers as central actors.

A third set of activities relates to the implementation of regional trials, trainings and data management to reinforce the ECOWAS seed catalogue. The capacity building of next generation breeders and associated disciplines in crop improvement is a cross cutting activity.

The project builds its interventions on lessons learned from previous technology scaling projects and synergizes with on-going projects (ABEE) on the target value chains to create more impact. The result-

based framework captures expected outputs, outcomes and impacts through performance indicators. It also includes monitoring, evaluation, and learning system using a digital based platform that combines continuous monitoring of the progress in real-time, evaluation surveys, and learning activities with key stakeholders to support field activities. Furthermore, it ensures that the project activities are being implemented as planned, supports data quality management, and identifies good lessons learned.

Main activities

The main activities of the project include:

- ✓ Modernize crop improvement stations.
- ✓ Conduct surveys on the performance of existing varieties and market demand.
- ✓ Develop market demand for nutrient dense and climate resilient varieties and hybrids.
- ✓ Conduct participatory evaluation of new varieties.
- ✓ Raise awareness about existing improved varieties through demonstration plots, rural radios, seed fairs and SMART FOOD campaigns (the Smart Food initiative aims at diversifying staples across Africa and Asia).
- ✓ Build capacity of Master and PhD students on modern breeding and associated domains.
- ✓ Exchange genetic material and data through joint trials and data management platforms at regional level.
- ✓ Strengthen capacity of farmers' organizations and seed companies in improved varieties seed production techniques through workshops.

Results achieved to date (October 2022)

Objective 1: Sustainably increase agricultural productivity in the face of population growth and climate change

Twenty four (24) Open-Pollinated Varieties (OPV) of sorghum; 13 hybrids of sorghum; 18 varieties of millet OPVs; 2 hybrids of millet; 5 varieties of groundnuts and 24 varieties of cowpea were documented to provide information on varieties available for scaling by relevant stakeholders such as research institutions, private seed companies and farmer organizations involved in seed multiplication. Six (6) new hybrids of very high yielding sorghum (up to 5t/ha) have been documented and included in the Malian variety catalogue in 2022. Five (5) new peanut varieties were documented. As for millet, the activity focused on 8 OPVs and 3 hybrids in 2022. Awareness of new varieties has increased.

In order to respond to the planning problem of seed production raised as a major challenge, a system for pre-ordering first-generation seeds was developed. Several partners benefited from training in seed marketing and business management.

Packaging seeds in mini sachets to ensure that low-income grain producers can obtain seeds, the use of seed outlets in villages to better bring seeds closer to farmers, as well as seed fairs have resulted in increased access to quality seed by farmers and in market creation for seed companies.

Two new Innovation Platforms have been set up in Ségou and Siby, allowing actors to find contextual solutions to identified constraints.

Through participatory breeding and seed production activities, APSAN Mali has also facilitated the linking of cooperatives with development projects. The seed producers' network was strengthened to increase sustainability of the seed delivery system.

Awareness of nutritious foods by the communities has increased as a result of a video report on the activities of Smartfood, which was broadcast on Cherifla TV with an estimated audience of 2,000,000 people.

Seed producer organizations improved their capacity through training in seed production, technical itineraries and cooperative post-harvest management was attended by 67 men and 18 women. 40 ULPC (Union Locale des Producteurs de Céréales) producers were trained on sorghum production and post-harvest management. With the Kayes agriculture sector, 40 producers received training on seed production and cowpea conservation. Four representatives of COOPROSEM (Coopérative des producteurs de semence de Mandé) were trained in quality seed production.

Availability of first generation seeds, critical for producing certified seed and boosting the availability of certified seeds, has increased due to the multiplication of 11 varieties of sorghum, millet, groundnut and cowpea.

Five (5) tons of basic seeds of a dozen varieties and hybrids of sorghum were supplied to companies and cooperatives for the production of certified seeds in the 2022 winter season. Certified seed production is underway by these seed companies and by farmers' organizations on more than 180 ha for the four crops. 5 companies and 6 cooperatives directly benefitted.

Objective 2: Improve smallholder resilience to climate change and economic vulnerability

Through trials of dual use varieties (sorghum, peanut, rice, millet), the project has identified dual purpose, high nutritious and climate resilient varieties, which will provide good food security to communities through crop varieties that are resilient to negative effects of climate change.

Objective 3: More effective regional exchange of genetic material and data within a breeding network coordinated by a regional Centre of Excellence

Activities involving institutional networks and strengthening, as well as improving, research approaches and methodologies have resulted in more optimized approaches for implementing activities and strengthened research networks and capacities using modern tools.

Objective 4: Sustainably strengthen the crop breeding research team in Mali

The project is involving 9 doctoral students, including 5 men and 4 women, 8 of these are fully covered and one is partially covered from the support of the APSAN project. This provides opportunity to build and strengthen human capacities and will provide long term sustainability through expertise to be gained from the training.

Organization

The APSAN project is structured around four work packages:

(i) Seed systems and technologies dissemination,
(ii) Crop improvement,
(iii) Functional regional research network,
(iv) Capacity building of the target value chains actors and students.

Implementing organization

The project is led by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).

Project partner

The project is jointly implemented with IER *"Institut d'Economie Rurale"*, which is the main partner.

Other stakeholders

CORAF, Farmers organisations in Mali (Union locale des producteurs de céréales (ULPC), Sene Yiriwaton, Coopérative des producteurs de semence de Mandé (COOPROSEM), Union Nietaa, Jigisèmè), Agricultural extension services, National NGOs (Malimark, EUCORD) and seed companies (SOPROSA, Camara Semences, Doun Ka Fa, Faso Kaba), Institut Polytechnique Rural de Formation et de Recherche Appliquée (IPR/IFRA)-Katibougou and University of Bamako.

Location

Mali

Funding and co-funding

European Union	€ 4,000,000
ICRISAT	€ 270,000
Total budget	€ 4,270,000

Duration

5 Years (October 2019 – October 2024)

Website

https://ue-apsan-mali.com/en/home/

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