

## Lessons from the impacts of a sorghum participatory breeding program addressing the needs of resource poor farmers in marginal areas of Nicaragua

Gilles Trouche<sup>1</sup> (gilles.trouche@cirad.fr), Blanca Castro Briones<sup>2</sup>, Genowefa Blundo Canto<sup>3</sup>, Carlos Bervis<sup>2</sup>, Javier Pasquier<sup>4</sup>, Kirsten Vom Brocke<sup>1</sup>

<sup>1</sup> AGAP Institute, Cirad, Montpellier, France ; <sup>2</sup> FECODESA, Pueblo Nuevo, Nicaragua ; <sup>3</sup> UMR Innovation, Cirad, Montpellier, France ; <sup>4</sup> FECODESA, Managua, Nicaragua

White-grain sorghum is an important food crop for resource-poor farmers of the dry belt of Central America. From 2002 to 2008, a participatory breeding program (PB) was implemented with local farmer groups in the Northern region of Nicaragua, aiming to develop sorghum varieties adapted to local cropping systems and farmers' needs.

From 2020 to 2022 an *ex post* impact evaluation of this program was carried out by Cirad and the farmer Union FECODESA using the "ImpresS" method. A detailed impact pathway and timeline of the innovation process were developed. Participatory workshops with farmers and institutional actors allowed to identify 20 impact descriptors and to refine the links between outputs, outcomes and impacts in the impact pathway. Translated into indicators, these impacts were assessed through a household survey with 127 farmers, focus-group interviews as well as secondary data. We found that 90% of interviewed farmers growing sorghum were still using varieties from this program. Among these varieties, one photoperiod-insensitive and one photoperiod-sensitive are cultivated by 76% and 29% of farmers respectively. The program enabled farmers access and evaluate directly in their own farming conditions a broad genetic diversity and thereby identify those varieties most resilient to the extreme climatic events and suited to local cropping systems as well as bringing resistance to sugarcane aphid that local cultivars do not have. Further the new varieties have improved grain quality for local food preparations. Major impacts perceived by respondents include better availability and access to quality seed, changes in sorghum production towards agroecological practices, and improved food security. This program also contributed to strengthen the local farmer organizations.

Comparing these results to those of sorghum PB programs implemented in Burkina Faso during the decade 2002-2012 enables us to understand internal and external factors driving the innovation process and its major outcomes and impacts.

### References:

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