PHOTO: NEIL PALMER

Linking Conservation and Cultivation: The Role of Genebank User Groups in Ghana

GENEBANK IMPACTS BRIEF No. 19 | June 2025

Introduction

The Crop Trust's Seeds for Resilience project introduced a novel participatory approach to use germplasm user groups (GUGs). This initiative sought to operationalize more dynamic pathways between the national genebank (Box 1) and local farming communities.

This study employed a mixed-methods design, combining quantitative surveys with 312 farmers (135 GUG participants and 177 non-GUG) across seven districts, and qualitative data from focus group discussions and key informant interviews.

SUMMARY

This brief highlights key findings from a 2024 impact evaluation in Ghana, which focused on how interactions between the genebank and germplasm user groups (GUGs) have influenced farmers' access to germplasm, farming practices and crop diversity. The focus has been on underutilized crops such as indigenous leafy vegetables (ILVs) and Bambara groundnut, which offer nutritional and climate-adaptive advantages. To facilitate this, Council for Scientific and Industrial Research–Plant Genetic Resources Research Institute (CSIR-PGRRI) has supported the establishment of GUGs, which are community-level groups that serve as an interface between farmers and the national genebank.

The Role and Impact of Germplasm User Groups

GUGs have emerged as critical platforms for increasing smallholder access to genebank materials and information. Almost all GUG participants (94%) had attended user group meetings, which included training, participatory varietal selection and seed distribution activities. In contrast, non-GUG farmers exhibited limited awareness of the genebank and its functions.

Participation in GUGs was driven by multiple motivations, including access to free seeds, training opportunities, and exposure to new crop varieties. Members consistently cited knowledge-sharing and improved seed access as the most valuable outcomes. The impact on seed acquisition is clear: while 73.6% of GUG farmers had never requested seeds from the genebank before joining, over 50% reported doing so at least annually after joining.

BOX 1 Ghana's Plant Genetic Resources Research Institute (PGRRI)

Ghana's Plant Genetic Resources Research Institute (PGRRI), under the Council for Scientific and Industrial Research (CSIR), manages the country's national genebank, located in Bunso. Established in the 1980s, the genebank conserves over 10,000 accessions of cereals, legumes, roots, tubers, vegetables, and indigenous leafy greens. It uses cold storage and field collections to preserve both seeds and vegetative material. PGRRI collaborates with farmers, researchers, and universities to promote the use of traditional and underutilized crops, many of which are climate-resilient. Through projects like Seeds for Resilience, PGRRI is strengthening its conservation practices and digitizing its collections using tools like GENESYS.

PHOTO: NEIL PALMER/CROP TRUST

BOX 2 About Seeds for Resilience

The Seeds for Resilience project, led by the Crop Trust since 2019, works to strengthen national genebanks in Ethiopia, Ghana, Kenya, Nigeria and Zambia. These genebanks conserve the crop diversity that is essential for developing climate-resilient, nutritious and productive crops. A key feature of the project is its collaboration with farmers, who evaluate and select varieties best suited to local needs. This farmer engagement helps prioritize seeds that are most useful for improving food security. By enhancing genebank operations and connecting them with farming communities, the project supports agricultural resilience across Africa. The goal is to make a wider range of climate-resilient seeds available to farmers, supporting sustainable agriculture and benefiting those most affected by climate challenges, particularly women, who play key roles in African farming systems.

These GUGs also served as a bridge between scientific research and local farming knowledge. Farmers reported that their understanding of crop diversity expanded significantly through group participation, influencing both attitudes and behavior. One participant remarked, "Being part of the group made me realize one crop can have different kinds – five or more varieties – and that was a revelation."

Germplasm Use and On-Farm Diversity

GUG farmers were far more likely to grow genebank-sourced seeds compared to non-GUG farmers (93.2% vs. 0%). Notably, 100% of Bambara groundnut growers within the GUGs used genebank seeds, and 87.2% of ILV growers had also done so. The genebank provided seeds through two primary channels: community-based group distributions and direct delivery by staff.

Satisfaction with genebank seeds was generally high, particularly for Bambara groundnut. Nearly 90% of these users reported being "extremely satisfied" with seed quality, noting improvements in germination, yield, pest resistance, and cooking quality. However, satisfaction levels were lower among ILV growers, many of whom cited insufficient seed quantities and delays in delivery.

Beyond seed access, GUG participation influenced broader farming practices. Approximately 22% of members adopted new crops, 17% diversified their cropping systems, and 18% improved pest and disease management. These findings reflect the dual impact of material support (seeds) and knowledge transfer (training and peer learning) facilitated by GUGs.

Sharing, Community Dynamics and Future Use

An important secondary effect of GUG participation was the diffusion of seeds and information within broader farming networks. Farmers often shared seeds with neighbors. One respondent reported sharing with 50 others, while the average was 20. This horizontal sharing mechanism helps amplify the genebank's reach and fosters a more resilient and interconnected farming community.

The majority of respondents (73.6%) had never requested seeds from the genebank prior to their participation in the germplasm user group (Figure 1). However, following their involvement, the percentage of farmers requesting seeds increased significantly from 21.6% once a year to 50.4% once a year. This indicates that participation in the GUG enhances farmers' ability to request seeds from the genebank.

Looking ahead, 90.5% of GUG participants stated they were likely to continue using genebank seeds in the next five years, and 84% planned to increase the area planted. These figures point to the long-term sustainability of the GUG-genebank model, provided that logistical barriers such as delayed seed delivery and quantity limitations are addressed.

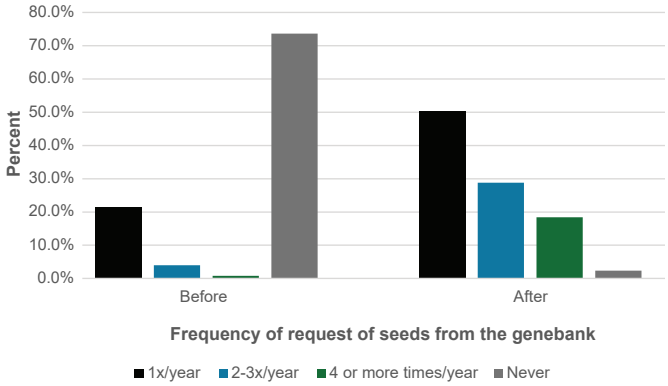

Figure 1. Number of times respondents request seeds from the genebank (before participation in GUG vs after participation in GUG)

BOX 3 Germplasm User Groups

Germplasm user groups (GUGs) are locally organized farmer collectives designed to foster collaboration, knowledge sharing and access to crop diversity in partnership with national genebanks. Developed with support from the Seeds for Resilience project, GUGs facilitate mutual learning and seed exchange tailored to local contexts. Their flexible structure allows adaptation to diverse social and agroecological conditions, making them effective conduits between genebanks and smallholder farming communities.

BOX 4 The Genebank Impacts Fellowship | Obed Asamoah

With over 12 years in Ghana's climate change sector, I previously overlooked seed diversity as the most critical pathway for farmer adaptation and food security. Most programs I engaged with emphasized costly irrigation solutions, overlooking the transformative potential of drought and pest-resistant seeds—a revelation that reshaped my perspective.

The Seeds for Resilience Fellowship ushered me into this critical arena, providing mentorship from the Crop Trust team and equipping me with skills in co-creation, impact measurement, and participatory approaches. Engaging directly with GUGs illuminated how farmer-led varietal selection—validated by the 93.2% adoption of genebank seeds in Ghana—drives both high satisfaction and sustainable resilience. Witnessing farmers champion diverse, climate-adapted crops like Bambara groundnut and ILVs underscored that true sustainability stems from empowering communities, not imposing solutions.

This fellowship has been foundational to my early research career, embedding in me the imperative to bridge conservation with cultivation for scalable, farmer-centered climate action.

Knowledge Gaps and Inclusion Challenges

The study uncovered significant disparities in awareness and access between GUG and non-GUG farmers. While 87% of GUG members were aware of the genebank, none of the comparison group respondents had heard of it. This suggests that without structured outreach or project support, genebank resources remain inaccessible to large segments of the farming population.

Sources of information for GUG participants included extension agents, farmer associations, genebank staff and radio or TV. However, genebank education campaigns are typically limited to project districts. As one staff member explained, "Farmers are not aware of the genebank unless they're part of a project."

Impact on Crop Resilience and Sustainability

Participation in GUGs has contributed to improvements in food security and climate resilience. Genebank seeds outperformed traditional varieties across five key indicators: yield (63% better), pest resistance (59%), time to harvest (67%), eating quality (58%), and resilience to extreme weather (59%).

Despite these benefits, broader trends point to an overall decline in crop diversity. More than 84% of all respondents reported a reduction in crop variety in recent years, and over 40% anticipated similar trends in the future. Key stressors included pest and disease pressures (44%) and climate-related events (45%).

Photo 1. Focus Group Discussions with the Bambara groundnut Genebank User Group, conducted on-site at farmers' fields

Photo 2. GUG members sharing a celebratory moment at the participatory varietal selection sit at Bugri Bulpielis in the Upper East Region of Ghana.

Encouragingly, about half of GUG farmers expressed a strong interest in increasing crop diversity on their farms, particularly through the introduction of new species and varieties. This signals an important opportunity for genebanks and agricultural actors to support farmer-led diversification.

Recommendations

Expand Awareness Campaigns

CSIR-PGRRI should implement broader educational outreach, targeting regions beyond current project sites. Community radio, farmer field days and partnerships with local leaders could help extend visibility.

Strengthen Extension Networks

Collaborate with agricultural extension officers to ensure that farmers can access up-to-date information on genebank services, seed availability, and application processes.

Establish Community Seed Banks

Local seed repositories managed by user groups could improve access, reduce delivery delays, and serve as entry points for farmers in neighboring communities. Seed banks will help improve coordination between genebank staff and GUG leaders to anticipate demand, ensure sufficient seed quantities, and avoid delays—particularly for ILV cultivators.

Encourage Participatory Breeding and Variety Selection

Continue involving farmers in varietal evaluation and selection to ensure that released germplasm aligns with their preferences and local agroecological conditions.

Conclusions

The Ghana impact evaluation confirms the value of GUGs in translating genebank conservation efforts into tangible benefits for smallholder farmers. GUGs not only facilitate access to diverse and high-quality seeds, but also foster peer learning, experimentation, and community resilience. Farmers involved in the user groups were more knowledgeable about plant genetic resources, more likely to use genebank seeds, and more adaptive in their farming practices.

Awareness of genebank services is largely limited to GUG participants. Many farmers outside these groups remain excluded from accessing improved germplasm or participating in training activities. Addressing this divide is essential for scaling the benefits of the initiative.

Furthermore, logistical issues in seed distribution, particularly for ILVs, threaten to undermine the trust and momentum built by the program. Ensuring timely and adequate delivery will be critical to sustaining farmer engagement.

Additional details can be found in the overview paper: Heaton et al., 2025

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ACKNOWLEDGMENT

The Crop Trust and the German Development Bank (KfW) provided funding for this research through the Seeds for Resilience project.

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