

Transformation of the Lebanon National Genebank through BOLD



Summary

The national genebank of the Lebanese Agricultural Research Institute (NGB-LARI) joined the Biodiversity for Opportunities, Livelihoods and Development (BOLD) project in 2022. At the time, Joelle Breidy, Genebank Manager of NGB-LARI, rated the institution's condition a four (out of 10) and described it as having "unequal opportunities, fragile infrastructure and instable." BOLD worked alongside NGB-LARI and invested in infrastructure, equipment, and staff training. This resulted in significant improvements in gender equality, workspace wellbeing, leadership skills, and security under political uncertainties. After three years, Breidy rated NGB-LARI's condition as an eight (out of 10) and being "resilient, professional, and inclusive," indicating the transformational change.

Background

Lebanon is located at the intersection of the Mediterranean Basin and the Fertile Crescent, a region central to biodiversity and the early domestication of major crops. It is a recognized center of origin for wheat, barley, and many other food and feed crops. Lebanon is home to approximately 2,612 native plant species, and includes 108 unique endemic plant species, accounting for roughly 0.03% of global plant diversity (Tohmé & Tohmé, 2014). Collections at NGB-LARI include accessions representing 37 of the species listed in Annex I of the International Treaty on Plant Genetic Resources for Food and Agriculture (out of 64 Annex I crop/forage entries), making this region especially important for

conserving its crop genetic resources to ensure local, regional, and global food security (FAO, 2016; Crop Trust, 2022).

The Lebanese Agricultural Research Institute (LARI) is the parent institute of the national genebank of Lebanon and began conserving crop diversity in 1996. Over the years, external donors have supported NGB-LARI primarily in the collection and safety backup of genetic resources. This funding did not focus on building staff capacity and upgrading facilities, which is a foundation that is essential for conserving high quality genetic materials. In 2022, the Crop Trust invited NGB-LARI to join the BOLD Project, which has a focused objective of supporting partner genebanks in capacity and resource development.

The Challenges

Before BOLD was involved, NGB-LARI faced several significant challenges including:

Outdated facilities and limited resources:

Facilities were old with limited technical equipment necessary to carry out standard operation procedures (SOP).

Gender inequality in training and leadership:

Although women were part of the team, they had limited access to structured training programs or leadership opportunities.

Operational disruption and insecurity due to political instability: Lebanon's ongoing political instability and repeated conflicts created challenging and insecure environments for staff and conserved genetic resources. For example, the Tel Amara station, which houses the genebank, is located in a high-risk zone and is at times inaccessible to staff due to conflicts.

The Solutions

BOLD selected NGB-LARI as a partner in 2022 and directly addressed these challenges by investing in infrastructure, equipment, and capacity training, resulting in several advancements. Breidy describes BOLD's involvement as "transformational" for NGB-LARI. These advancements include:

Improved facilities, SOPs and data system:

BOLD's support has helped NGB-LARI to transform its facilities into a well-equipped modern workspace, which includes dedicated seed labs, drying and storage rooms, and a data sharing system. This upgrade enabled the regeneration of 130 critical accessions, viability testing for 150 accessions, publication of passport data for 2510 accessions on Genesys and development of new standard operating procedures (SOPs). BOLD bridged critical gaps, allowing NGB-LARI to conserve accessions according to international standards and share conserved resources locally, regionally and globally.

Advanced gender equity in training and leadership:

NGB-LARI is a small but efficient team of six: a woman leader, Joelle Breidy, with four of the five staff being women. BOLD provided leadership and capacity training for all team members of NGB-LARI, ensuring gender equality in training opportunities and equitable knowledge gain in technical skills and key roles. These efforts increased staff motivation and confidence, supported an efficient workflow, and enhanced workspace wellbeing significantly.

Resumed seed safety duplication after conflict:

BOLD assisted NGB-LARI so it could upgrade facilities with security and remote monitoring systems, to ensure a safe and resilient workspace capable of withstanding unexpected situations.

The BOLD Project

BOLD (Biodiversity for Opportunities, Livelihoods and Development) is a 10-year initiative to strengthen global food and nutrition security through the conservation and use of crop diversity. Funded by the Government of Norway since 2021, BOLD supports national genebanks in Africa, Asia and Latin America to better conserve, manage and share their collections with farmers, breeders and others for resilient, productive food systems.



After the 2024 conflict, NGB-LARI quickly resumed work, achievements that would not have been possible without durable facilities and sufficient training support from BOLD. Additionally, BOLD is supporting the NGB-LARI team to complete seed duplication at the Svalbard Global Seed Vault to avoid fatal losses to the seed collection under future uncertainties.

According to Breidy, the current foundation built during BOLD Phase 1 (2022-2025) through improved facilities, trained staff and upgraded systems is very strong. However, the sustainability of these achievements will require continuous investment, especially in safety duplication of future seed collections and increasing in regional collaboration.

Today, NGB-LARI is better equipped with modern facilities and supported by a trained, passionate staff, enabling the genebank to better conserve and regenerate seeds, improve genebank practices and expand its capacity to work closely with local communities and regional collaborators to promote and provide required genetic resources when needed (Figure 1). Breidy highlighted the core motivation behind her and her team's work: "We are driven by the belief that preserving seeds and empowering people are two sides of the same mission – both essential for survival, resilience, and hope." An empowering message that shows the importance of NGB-LARI and BOLD's work in safeguarding both genetic resources and the people who steward them.

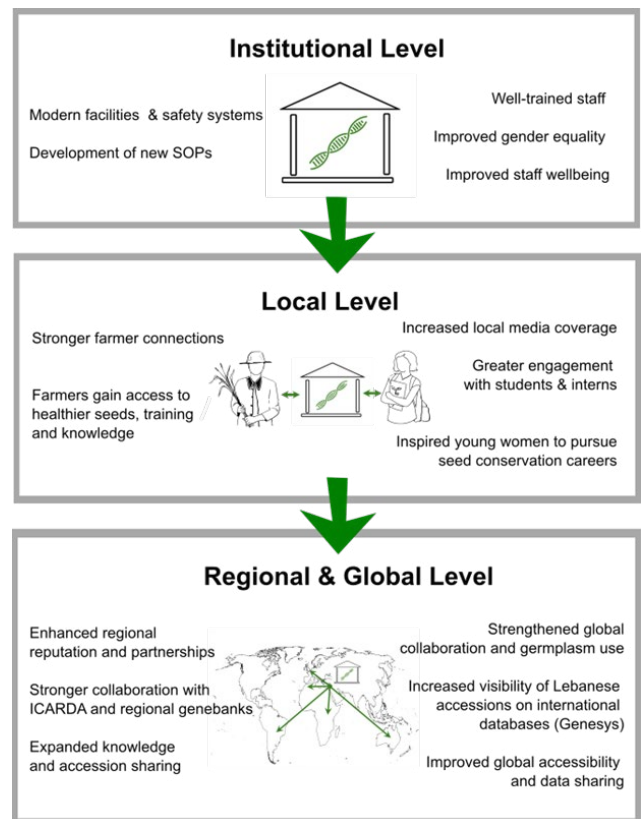


Figure 1. Impacts of BOLD's support on the Lebanon National Genebank at the institutional, local, regional, and global levels. Source: Joëlle Breidy. Figure credit: Yue Yu and Thomas Ferguson

"Without BOLD, the organization would not have been able to recover and resume work after the 2024 conflict. The facilities would likely have been severely damaged if they had not been strengthened beforehand through BOLD's support. Additionally, training and professional development provided by BOLD allowed the staff to be confident and prepared to handle disruptions and resume operations quickly." – Joelle Breidy

References

- Tohmé, G., & Tohmé, H. (2014). Illustrated Flora of Lebanon. National Council for Scientific Research (CNRS-Lebanon), Beirut.
- FAO (2016). State of Plant Genetic Resources for Food and Agriculture in Lebanon. Country Report prepared for the Second Report on the State of the World's PGRFA. Food and Agriculture Organization of the United Nations, Rome.
- Crop Trust (2022). National Seed Bank of Lebanon – Project Profile. Global Crop Diversity Trust. Available at <https://bold.croptrust.org/genebanks/lebanon/>.
- International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). Annex I – List of Crops Covered by the Multilateral System. Food and Agriculture Organization of the United Nations.

Additional details can be found at <https://bold.croptrust.org/>

Suggested citation: Yu, Y., Breidy, J., Aguilar, C.H., Major, M., & Jamora, N. (2025) Transformation of the Lebanon National Genebank through BOLD. Genebank Impacts Brief No. 22. Crop Trust. <https://doi.org/10.5281/zenodo.18885506>

Authors

Yue Yu
BRITE intern, Crop Trust
Ph.D. Candidate in Botany
University of British Columbia

Joëlle Breidy
Genebank Manager
Lebanon National Genebank

**Nelissa Jamora,
Catherine Hazel Aguilar,
Michael Major**
Crop Trust

