



***Evaluation of
CGIAR research support program for
Managing and Sustaining Crop Collections:
Genebanks CRP***

Summary Report

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Independent
Evaluation
Arrangement

Summary Report

Background and context

The *ex situ* crop collections held in genebanks of 11 CGIAR Centers are among the largest and most diverse globally and are of major importance for agriculture and food security. Since 1994, through formal agreements between Centers and FAO, the collections have been held in trust under the auspices of FAO for benefit of the international community. The International Treaty on Plant Genetic Resources for Food and Agriculture (hereafter, the International Treaty), negotiated by the FAO Commission of Genetic Resources for Food and Agriculture (hereafter, the FAO Commission), came into force in 2004. It legislates for access of agriculturally important plant genetic resources under a Multilateral System of Access and Benefit Sharing. Article 15 of the International Treaty provides the legal framework under which the *ex situ* collections of plant genetic resources for food and agriculture are held by CGIAR Centers and other international institutions.

The CGIAR program for *Managing and Sustaining Crop Collections* is a research support program (hereafter, the Genebanks CRP). Genebanks CRP was approved for five years (2012-2016) for the management and the sustainable funding of the crop collections held in the genebanks of 11 CGIAR Centers. The CRP is a partnership between the CGIAR Consortium and the Global Crop Diversity Trust (hereafter, the Crop Trust). It represents a unique institutional arrangement for CGIAR because the “Program Manager”, the Crop Trust, is a non-CGIAR entity, which together with the CGIAR Consortium has had responsibility for the dual governance of the CRP. The Crop Trust was selected due to its mandate to support the conservation and availability of crop diversity for food security worldwide through a “rational global system of crop genebanks”. Considered an “essential part of the funding strategy” of the International Treaty, the Crop Trust is developing an endowment fund to support the conservation of important crop diversity in perpetuity, through institutions such as CGIAR Centers. The endowment would eventually resolve the issue of sustainable and secure funding for the genebanks. As the Crop Trust endowment has yet to be completed, the funding for CGIAR genebanks was to come from other sources, mainly Window 1, and therefore the CRP was created as a research support program that does not engage in research.

The Genebanks CRP’s purpose is to conserve the diversity of plant genetic resources in CGIAR-held collections and to make this diversity available to breeders and researchers in a manner that meets high internationally agreed genebank standards, in a manner that is cost-efficient, secure, reliable and sustainable over the long-term, and is supportive of and consistent with the International Treaty.

Purpose, scope and objectives of the Evaluation

The primary purpose of this Evaluation is to support the improvement of the efficiency, effectiveness and sustainability of the management of CGIAR’s genebanks for secure conservation and ultimately enhanced use of the collections of plant genetic resources for food and agriculture. The Evaluation provides an assessment of the Genebanks CRP’s performance since its beginning, and provides lessons and recommendations to strengthen the operations and management of the new Genebank Platform.

The Evaluation scope was determined both by the specific mandate of the Genebanks CRP on one hand and the System-level needs with regard to *ex situ* genetic resources on the other hand. Therefore, the Evaluation also provides lessons on CGIAR System-level issues related to genetic resources conservation and use over and above what was included in the CRP, such as policy, reputation and representation of CGIAR and communication about its genebanks.

The Evaluation assessed the extent to which the Genebanks CRP has made progress towards achievement of its objectives, and has brought about positive changes in key areas of activity. It assessed the Genebanks CRP's governance and management, development and set-up, efficiency and effectiveness of implementation and funding. It also assessed the continued appropriateness and realism of the objectives as the Genebanks CRP transforms into Genebanks Platform. It explored the potential for increasing efficiency and effectiveness of central genebanks management operations in the future, and financial sustainability and realization of the endowment.

Approach and methodology

The Evaluation focused on four Key Questions and one Overarching Question:

- Key Question A, related to Efficiency and cost-effectiveness: Has the Genebanks CRP enhanced the management (and use) of CGIAR crop collections?
- Key Question B, related to Effectiveness: Has the Genebanks CRP enhanced the technical performance of Center genebank operations?
- Key Question C, related to Sustainability: How has the Genebanks CRP improved the security of CGIAR crop collections?
- Key Question D, related to Management and Governance: Has the Genebanks CRP been well managed and appropriately governed?
- Overarching Question: What has been the value added from the unique institutional arrangements of the Genebanks CRP?

The following are the most important sources of evidence that the Evaluation used for addressing the evaluation questions and as basis of its findings and conclusions that subsequently led to the recommendations.

- Review of governance and management records such as: CRP management meeting minutes; Crop Trust Board meeting summaries; Fund Council meeting records, Consortium Board summary record.
- CRP annual financial and technical reports and an Achievement Matrix provided by the Crop Trust at the Evaluation Team's request.
- 2015 Internal Audit Report for Genebanks CRP.
- Over 200 interviews with: the CRP Management Team; Staff at the Crop Trust; Center genebank managers and international and national staff; Center staff representing users and stakeholders of genebanks; external users in national genebanks and external experts; representatives of FAO Commission and the International Treaty; representative of Center and the Crop Trust governance; and staff at the Consortium Office and Fund Office.

- Surveys among Center senior management (through Directors General) and donors who contribute significantly to CGIAR, particularly through Window 1.
- Field visits to CIAT, CIMMYT, CIP, ICRAF and ILRI, and the 2016 Annual General Managers meeting in Australia.
- Factual data on genetic resources routine operations and flows to assess changes and variance in operations, for which the Online Reporting Tool (ORT) was an important source of information.

The Evaluation Team took into consideration the changes in the Genebanks Platform and the extent to which any issues of concern from this Evaluation appear to be addressed in the Platform.

Main findings and conclusions

Overall, the Evaluation concludes that the Center genebanks are now in a much better situation than before the Genebanks CRP, and much of the progress can be attributed to the Genebanks CRP. Resulting from the Genebanks CRP, there has been guaranteed funding, which has underpinned progress in synergy and harmony. Centers have developed long-term plans and, probably for the first time in the case of several genebanks, have been able to implement these plans without interruption, largely due to the stable funding for genebank operations over the past five years. The Genebanks CRP has promoted and encouraged such collaboration in a way that was more limited in the past. Center genebanks now routinely share common conservation approaches for the same (or similar) crops, exchange protocols, and even personnel on a short term basis, with Centers benefiting from each other's expertise.

A number of activities and initiatives have enhanced synergy and performance of individual genebanks, some of which are solely down to the existence of the Genebanks CRP. The most important activities initiated or promoted by the CRP include rolling out and implementing a Quality Management System (QMS), conduct of external financial and independent technical reviews for each Center genebank and funding critical actions deriving from review recommendations, work on data management systems, capacity development and coordination of collaboration and sharing of information and experiences. Genebanks are improving and on trajectories to meet the conservation and operational projections described in the Genebanks Platform proposal.

CRP governance

A dual governance arrangement was agreed for the Genebanks CRP, where the Crop Trust Executive Board had the primary role in the governance of the CRP, with oversight of management including financial accountability to the CGIAR Consortium Board (currently System Management Board) for the Genebanks CRP. Unlike with other CRPs, the Consortium was given an explicit role in the Genebanks CRP's governance and its management, which reflects the System-wide nature of the CRP and the System-level responsibilities of the Consortium.

The Evaluation concludes that the governance of the Genebanks CRP by the Crop Trust has largely been effective, which is evidenced by the level of reporting accountability from the genebanks to the

Crop Trust Executive Board, technical progress made across the genebanks, and overall satisfaction by the genebanks staff of the Crop Trust as manager of the program. However, there were some deficiencies in the Executive Board's oversight of the CRP. It did not receive specific CRP reports and updates, and items related to the Genebanks CRP did not seem to be clearly differentiated from other topics, such as scientific reporting, despite the Genebanks CRP being the largest compared to the Crop Trust's other projects. Regarding communication, there was lack of clear responsibility, strategy and resources, and this led to a situation where the accomplishments of the CRP were associated with the Crop Trust rather than with CGIAR and the Center genebanks.

The Consortium Board was expected to appoint a member to the Crop Trust Executive Board, but it was represented only at the first four meetings and then again in 2016. The Consortium Office was to facilitate the relationship between the Consortium Board and the Crop Trust by bringing matters to the attention to the Consortium Board and by following up on the Consortium Board's decisions. However, while the Consortium Board discussed the CRP regularly, it approached the Genebanks CRP as primarily a financial arrangement with the Crop Trust and focused, with few exceptions, on the approval of funding for the CRP.

The lack of follow-through and engagement in the CRP's governance and also management by the Consortium deprived the program of a "senior partner" able to complement the role of the Crop Trust in planning and decision-making. In addition, it affected interactions between the Crop Trust, Centers' leadership and the Consortium Board regarding System-wide issues at a more strategic level. For example, the closure, after the CGIAR reform, of two long-standing CGIAR entities (Genetic Resources Policy Committee and System-wide Genetic Resources Program) that had responsibilities on genetic resources policy and representation of CGIAR internationally, resulted in the lack of clear mechanisms within CGIAR to address policy matters. Also, there was decline in the visibility, representation and engagement of CGIAR on behalf of the System's genebanks. The loss of "voice" and representation in these areas created a vacuum and inability to provide a balance of interests within the Consortium-Crop Trust partnership.

The Evaluation also considered the Centers' oversight role. None of the governance and management arrangements for the Genebanks CRP relieves the Centers of their primary responsibility for the safety, sustainability and effective management of the individual genebanks in their care. The Evaluation found that issues related to the management and governance of the genebanks, and the Genebanks CRP, are usually handled at Center senior management level, and that Center Boards discuss genebanks only occasionally. However, the Quality Management System, that includes a risk management register, has actually enhanced risk management and oversight, which is one of the Boards' responsibilities. The Evaluation considers that there is scope for the Centers and their Boards to play a valuable role in CGIAR strategy, goals and priorities for genebanks.

The Evaluation assessed whether there is potential for a conflict of interest deriving from the governance and management of a CRP by an organization "outside" CGIAR that has its own mandate, goals and priorities related to conservation of genetic resources. Given that the endowment contribution to the Genebanks CRP over the past five years has never exceeded 20 percent, there is

limited risk of conflict of interest in the Crop Trust being both the CRP manager and donor. Indeed, in order to address the potential conflict of interest concerning genetic resources policy, where the Crop Trust has its own policy role, policy was not included in the Genebanks CRP, and in the Genebanks Platform policy is a separately coordinated module.

The Evaluation found that communication gave little visibility to the Genebanks CRP as a CGIAR program. This shortcoming, the Evaluation Team concluded, resulted from lack of attention on the part of the Crop Trust in particular, rather than due to any conflict of interest, but also lack of attention of the Consortium to the need for CGIAR to be visible in and off itself as the guardian of the crop collections.

CRP Management

The Genebanks CRP core management activities included technical, strategic and financial management; development and use of management tools; and interaction with the genebanks. The day-to-day management and technical support of the Genebanks CRP has largely been the responsibility of the CRP Coordinator and involves all together some 14 staff at the Crop Trust resulting in 7.1 full time equivalent for the Program in total (as per record of 2015). Considering that the CRP covers 11 Centers and the wide spread of activities, the Evaluation considered this appropriate.

There was general satisfaction with both financial and technical management of the CRP. The technical issues are complex, given the wide range of crops in the genebanks, and effective management has required developing a high level of crop understanding. This has led to constructively helpful interactions between the CRP Coordinator and individual genebanks. Both financial and technical management and accountability have involved reporting from genebanks to the Crop Trust through the online reporting tool, which is highly regarded. It was developed by the Crop Trust, which also provided guidance and feed-back. Financial management was described as well-organized and efficient with noted improvement over the years, and reporting from the Centers to the Crop Trust has been very detailed. This has led to better management and improved internal oversight of planning, costs, and spending across the genebanks.

The Genebank CRP management operates in consultation with the Management Team. Broadening the composition of the Management Team in 2013 to include representation of the genebank managers has strengthened the Team by engaging an essential stakeholder group in discussions that covered technical, resource, communications and financial areas. Meetings, however, focused mainly on updates and logistics, with little content on clearly strategic issues. Furthermore, the Management Team require its Terms of Reference clearly spelled out. The Consortium Office had a seat at the Management Team in order to serve its role in promoting system-level coordination and facilitating communication, providing feedback and participating in planning, but it participated very infrequently – only in half of the regularly held meetings.

An example of positive aspects of the CRP management was the external independent technical reviews organized to assess genebank operations and recommend measures to overcome any bottlenecks. The external reviews resulted in Recommendation Action Plans that were funded

according to individual genebank needs. Overall, these reviews have helped to consolidate and, in some cases, implement state of the art conservation, and should be continued periodically.

The Annual Genebank Managers meeting, convened by the Management Team, have been an important forum for all genebanks managers, CRP management and other Crop Trust staff, and they have involved also the Consortium Office. They were organized to review the past year's activities, progress and achievements, and to make plans for the next year. They have been extremely valuable for managing and coordinating technical developments in the CRP, and have been an important mechanism for enhancing synergy and harmonizing activities amongst the genebanks. They have facilitated an increased understanding of problems and issues experienced by individual genebanks, and involved engagement with national genebanks and international technical and scientific experts.

Fund allocation and financial stability

Funding was done on the basis of the 2011 Costing Study¹, commissioned by CGIAR and implemented by the Crop Trust. The Costing Study was done to provide, to the extent possible, accurate cost estimates for routine operations on conservation of the entire range of crops across CGIAR genebanks². The largest item for fund allocation (over 75 percent of annual funding) has been the standard, recurring genebank activities costs. Following the finalization of the Costing Study, and its use as a basis for allocation funds for genebank operations, areas which were insufficiently considered came to light, such as personnel promotions, capital investment needs, inflation, and volatility of foreign exchange markets. Furthermore, the requirement for full costing and Centers interpreting and applying full cost accounting inconsistently affected funding available for the genebank operations. Subsequently, a Parity Study was conducted in 2015 to address these problems, but these issues remain to be resolved. It is important that efforts continue to arrive at a better definition and analysis of recurring routine costs so that continued guaranteed donor support for the genebanks will not be at jeopardy.

Fund allocation to genebanks through the program has also included non-recurring items that were funded on basis of prioritization and items identified through the external reviews as critical following a bilateral negotiation between the Crop Trust and the specific Center genebank. The Genebanks CRP has funded some capital requirements, and activities intended to enhance cost-efficiency in basic conservation areas common to several or all genebanks, such as seed longevity.

While financial matters and updates were provided at the Management Team meetings, the Management Team did not have a clear role in decision concerning fund allocations. For transparency, the Evaluation Team considers it important that all future fund allocations would be made at the Management Team meetings and not bilaterally.

¹ The Cost to the CGIAR Centers of Maintaining and Distributing Germplasm
http://library.cgiar.org/bitstream/handle/10947/2700/The_Cost_to_the_CGIAR_Centers_of_Maintaining_and_Distributing_Germplasm.pdf?sequence=1

²Costs for ICRAF's germplasm collections were estimated separately.

The Evaluation Team considers that the five-year time frame covered by the Genebanks CRP was unrealistic for raising the full endowment (USD 525 million) as initially anticipated by the Crop Trust. The full endowment for supporting CGIAR genebank operations is currently estimated to be even higher. The Evaluation Team considers that the transition period to full funding from the endowment will take longer than was originally forecast.

Reporting

Feedback from Centers was broadly favorable about reporting through the online reporting tool, particularly with regard to financial reporting and accountability. Technical reporting has been done according to annual work plans to monitor progress on targets for a set of indicators as per the genebank standards. The Crop Trust staff have been assiduous in assessing the reports from Centers and providing feedback as necessary. However, the amount of detail requested was sometimes considered excessive, partly due to the same high level of detail in information requested to be reported for each crop collection separately.

Regarding annual reports, the Team recognized they were a synthesis about what the genebanks had achieved compared to the level of detail submitted by the genebanks via the ORT. Given that the Genebanks CRP was a research support program and the template used by other CRPs did not suit this program, these issues were discussed with the Consortium Office in early 2013, with an initial understanding on how to address the specific needs of the program. This dialogue did not progress leading to a somewhat strained relationship between the Genebank CRP Management and the Consortium Office.

The Evaluation Team found that the annual reports did not easily facilitate the Team's need for information on the program achievements and progress over the years. This was partly because the template largely followed the format of other CRPs with sections on impact pathways and outcomes, and partly because there were changes in reporting on indicators over the years. The section on achievement which would have allowed elaborating on progress in genebanks and developments in the program, were found to have limited information. The Genebanks CRP reports contained as part of the CGIAR portfolio reports were informative, but by default were brief, focusing on program highlights. Thus the Evaluation Team was unable to determine what progress the CRP had made against the original program objectives that were spelled out in the approved CRP proposal. The Evaluation Team therefore requested a CRP Achievements Matrix for its perusal.

Representation of the Genebanks CRP and CGIAR in external fora and reporting to the FAO Commission and the International Treaty concerning genetic resources activities, which was not part of the CRP, was not consistent during the period the CRP was in operation. Rather, representation was piecemeal, and an opportunity was lost to demonstrate how CGIAR, as a System, was meeting its international obligations, and also to bring its collective experience and expertise to bear in these international fora. This seems to have followed from lack of agreement on how, and at which level or by whom, CGIAR should be represented particularly at FAO meetings.

Communications

The Genebanks CRP has not had a communications strategy for the program as a CGIAR CRP, nor social media presence. The Genebanks CRP management should have, from the outset, developed a communications strategy for the CRP, independent of the Crop Trust, to raise the profile of CGIAR genebanks in recognition that most of the funding has come—and for some time will still come—from CGIAR. The lack of giving the CRP greater visibility as a CGIAR Program has not served the CRP nor CGIAR well. Joint communication by the Crop Trust and CGIAR could have been used for resource mobilization, highlighting how guaranteed funding through Window 1 and centralized management have enhanced the technical effectiveness and efficiency of the CGIAR genebanks, and to highlight the special relationship between CGIAR and the Crop Trust. The website being developed for the Genebanks Platform is long overdue.

Efficiency and effectiveness

The Genebanks CRP has led to improved efficiency of genebank operations by enhancing synergy and harmonization across the genebanks, particularly through the Quality Management System (QMS). The QMS has become an evidence-based, flexible framework to enhance standards across CGIAR genebanks, facilitate cross-genebank learning approaches, promote accountability and ownership of genebank operations at all staff levels, and help Centers to address non-financial resource aspects such as staffing and succession planning. Capacity has been built through Genebank Operations Advanced Learning workshops through which, to date, over 100 genebank personnel have received training in the QMS, bar-coding, the scope and obligations of the International Treaty, plant health, and several other topics. This capacity building has also been offered to staff from national genebanks, which is highly commendable. The QMS demonstrates distinct advantages of distilling the comprehensive FAO standards into a set of approaches and procedures that can be easily implemented by genebanks, and the manual being developed will be useful across genebanks worldwide.

The implementation of common approaches and improved collaborations among the genebanks has been successful to help save costs in individual genebanks, and progress has been made through the CRP to increase cost-effectiveness where possible. Cost savings across Centers have, however, not been as high as might have been expected because of the inherent differences among genebanks, and the conservation approaches for their collections. The Evaluation Team did not consider rationalization of collections by elimination of duplicate samples across seed collections worthwhile for cost saving, because of the time, effort and costs involved in the activity and because there are no space constraints. For forages, rationalization and prioritization for conservation is logical given the range of species. There is also potential for improving cost-effectiveness for vegetatively propagated species where costs of conservation are high. Upfront costs for cryopreservation, in particular, are very high but given that it allows very long-term storage, it is likely to be the most cost-effective means to conserve clonal material. While successful routine cryopreservation protocols for CGIAR clonal germplasm collections exist only for potato and *Musa*, promising results have been achieved for cassava and sweet potato.

During the Genebanks CRP, individual genebanks have improved their performance, and thereby their effectiveness. The external technical reviews were important for identifying issues and bottlenecks in individual genebank performance, and because funds were allocated to implement prioritized actions. Center genebanks have upgraded their operations and facilities through many activities supported by the CRP, particularly: the QMS and capacity building associated with it; use of bar-coding in all operations; resolving seed conservation and longevity issues; expanding *in vitro* and cryopreservation approaches; and accelerating safety duplication of seed collections in the Svalbard Global Seed Vault.

Efficient, secure and reliable data management systems are essential to achieve the objectives of the Genebanks CRP, particularly making genetic resources better accessible to their users. The CRP focused on two pieces of software, namely Genesys, as a global portal for plant genetic resources information, and GRIN-Global, a genebank information management system. Genesys provides access to data on plant genetic resources maintained in international and national genebanks around the world, including the CGIAR genebanks. The CRP staff at the Crop Trust have done well to promote the use of Genesys amongst CGIAR genebanks in a relatively short space of time, and all genebanks are now contributing data to Genesys. This represents a distinct improvement over previous arrangements where global access to germplasm information was through individual genebank databases. Available data includes accession-level passport, characterization and evaluation data. Genesys is fulfilling one of its primary objectives of permitting access to information about the CGIAR genebank collections that, in turn, aim to enhance use of germplasm. Full benefit requires that all genebanks upload data frequently, which is not yet happening.

GRIN-Global is a data management system for genebanks, providing a complete genebank inventory management application. Work is underway to link GRIN-Global and Genesys, which is needed. The Evaluation Team considers that wider uptake of GRIN-Global, already used or being introduced in eight Centers, will be important because it will be replacing platforms in genebanks that are either outdated, inadequate or soon to be unavailable. However the continued lack of compatibility between breeders' data and GRIN-Global is perceived by several stakeholders as one of the issues still to be improved.

Standards, indicators and targets

The Genebanks CRP guidance to genebanks and monitoring have enhanced the conservation of the crop collections towards meeting international genebank standards set by the FAO Commission. The CRP has used a set of performance indicators to monitor how individual genebanks were upgrading their operations, making their collections safer, better documented and, ultimately, more accessible. Monitoring also demonstrates to the donors how stable funding was used to enhance genebank performance. Nevertheless, setting of the targets overlooked to some extent the challenges faced by many of the 11 genebanks, because they did not sufficiently reflect the biology and complexity of the different germplasm collections. The way targets were set did not allow consistent monitoring of incremental changes towards achieving overall conservation standards. Therefore, the reporting on targets at an aggregate level across very different collections and situations may give a wrong impression that the CGIAR genebanks are falling short in terms of their annual performance. Indeed, a “steady state” (such as elimination of regeneration backlogs, or germplasm safely duplicated at the

Svalbard Global Seed Vault and elsewhere) will not be reached in all genebanks for some years to come. This is partly because crop collections continue to change in a dynamic manner, as germplasm gaps are filled (with collections potentially increasing in size) and use of new technologies permits rationalization of germplasm holdings. Concerning dissemination of accessions, new approaches to better target useful accessions can help reduce the number of samples that need to be distributed thus affecting what targets are reflective of performance.

Lessons for the future

The Genebanks Platform builds, and expands on, on the achievements of the Genebanks CRP in areas of genebanks operations and performance. It incorporates an additional module on policy and includes research in the conservation module. These are important improvements. The policy module will help assure that CGIAR addresses - at the System level - an area that is essential both for CGIAR's own operations and its reputation and visibility, as well as international engagement and leadership in this area. It is also important that CGIAR, as a System, engages more actively in international fora - the International Treaty and the FAO Commission - and contributes its experience and expertise to negotiations that affect access to and use of plant genetic resources. Unless it becomes more active in this respect, there is a danger that policies will be put in place that could undermine CGIAR's freedom to use and exchange germplasm.

An Independent Advisory Committee has been proposed for the Genebanks Platform, being composed of four independent experts on plant genetic resources, three *ex officio* delegates from the Centers and the Executive Director of the Crop Trust. Such a committee is most appropriate, and it is very important that it has the expertise and standing to contribute to the success of the Genebanks Platform and to bring and independent perspectives to contribute to the oversight and management of the Platform. External experts can bring independent and external scrutiny and advice that will be very important to strengthen CGIAR's relationships with external bodies, and promote international understanding and transparency of CGIAR's stewardship of genetic resources.

The Genebanks CRP was established and implemented under an institutional arrangement that was unique because the CRP was managed by an organization independent of CGIAR, the Crop Trust. Given the particular strength of the Crop Trust in genetic resources management, it needs to be seen also as a valuable strategic partner, rather than just a manager. Overall, CGIAR should use the Genebanks CRP experiences, and those from the Genebanks Platform to come, to learn lessons for harnessing high level partnerships to the fullest for advancing CGIAR goals and mission. The Genebanks Platform gives CGIAR and the Crop Trust an excellent opportunity to collaborate closely on all issues related to CGIAR genebanks.

Summary of Recommendations

Recommendation 1. The System Organization should contribute to the effective governance and management of the Genebank Platform, by consistently representing CGIAR on the Crop Trust Executive Board and the Genebank Platform Management Team.

Recommendation 2. The Crop Trust Executive Board should execute a clearly defined role practicing its responsibilities in the oversight and governance of the Genebank Platform, distinguishing this role from its governing role for the Crop Trust, particularly with regard to Platform funding, its allocation, and use, and it should report the status regularly to CGIAR.

Recommendation 3. Given the shortcomings in the original Costing Study, and despite difficulties encountered earlier, the Genebank Platform management should give high priority to revisiting the Parity Study to establish realistic and transparent budget for each Center genebank.

Recommendation 4. The Genebank Platform management should subject all fund allocation proposals for approval by the Management Team, and ensure that all decisions on fund allocation are recorded in Management Team meeting minutes and available to Centers and genebank managers in order to maintain a high level of trust and transparency.

Recommendation 5. Given that the Genebank Platform is not a research program and that its mandate and aims are different from those of the CRPs, tailor-made reporting format needs to be agreed for the Platform. Therefore the Genebank Platform management and the CGIAR System Management Office should, at the earliest opportunity, agree on bespoke reporting needs and format to serve CGIAR and the wider genetic resources community better.

Recommendation 6. The Crop Trust should incentivize and empower the Genebank Platform management to promote the Platform independently from the Crop Trust's own communications, in order to ensure that a comprehensive communications strategy is developed to promote the visibility and accountability of the Platform and the CGIAR genebanks. Furthermore, the Genebank Platform Management Team should use the communications strategy effectively for:

- promoting the work, progress and achievements of the Genebank Platform and its component modules;
- promoting cross-Center activities, details about germplasm exchange, and use of Standard Material Transfer Agreements;
- publishing minutes from the Genebank Platform meetings, including the Annual Genebank Managers meeting; and
- supporting recognition of the historic and current efforts of the CGIAR Centers as some of the main custodians of genetic resources worldwide.

Recommendation 7. Given that the Quality Management System has become a key mechanism for enhancing genebank operations, the Genebank Platform should build on this success by:

- compiling lessons learned from Quality Management System to operationalize the FAO Genebanks Standards into easily implementable approaches and procedures, and report

regularly to the FAO Commission on their use which would help genebanks worldwide to enhance their performance;

- determining, at the earliest opportunity, if external validation of Quality Management System is needed and if so, what form it should take, and to whom such a validation role might be assigned.

Recommendation 8. Use of germplasm for research and crop improvement requires access to germplasm that has been adequately characterized and evaluated for resistance to and tolerance of biotic and abiotic stresses. In its future data development efforts, the Genebank Platform management should:

- enhance linkages between genebank characterization and breeders' evaluation and pedigree data; and
- expand the utility of GRIN-Global more specifically for *in vitro* collections.

Recommendation 9. For ensuring CGIAR's effective engagement in genetic resources policy dialogues and regular representation at international fora, the FAO Commission and the Governing Body of the International Treaty in particular, the System Management Board should oversee that the System Organization, Centers, and the Crop Trust as manager of the Genebank Platform clearly define and agree on their respective roles and responsibilities regarding representation of CGIAR internationally, taking into consideration that the Genebank Platform's policy module reports to the System Management Board/General Assembly.

Recommendation 10. Given that close linkages between the Genebank Platform and the Excellence in Breeding and Big Data Platforms will be essential for strengthening genetic conservation and use, the Genebank Platform Management Team should agree with the managements of the other two Platforms appropriate protocols for data exchange and use. This coordination will take advantage of CGIAR's unique position of spanning the whole range of activities from conservation to use, and minimize the Platforms developing as silos in isolation from one another.

Recommendation 11. Given the broader mandate of the Genebank Platform compared to the Genebanks CRP, the Crop Trust Executive Board should ensure strong strategic leadership and vision for the Genebank Platform either through establishing an additional position (of a Platform Manager) to those currently described in the Platform proposal or by expanding the role of the Platform Coordinator.