IRRI Genebank Review 2012

Programme: Genebanks CRP		
Genebank reviewed: IRRI	**Site visit Dates:**	31 Jan 2012 - 04 Feb 2012
	Review report Date:	21 Feb 2012
	Center and Crop Trust responses:	
Place: Los Baños, Phillipines		

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CGIAR RESEARCH PROGRAM FOR Managing and Sustaining Crop Collections

CROP TRUST
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IRRI 2012 Genebank Review: recommendations and responses

	Recommendation	Responses by IRRI	Responses by Crop Trust
1. Early release of funding from the Trust	The review team noted that the funding from the Trust is usually released in a later period of the year because of reporting requirements. In order to better manage the programme cycle, the review team recommends that the Trust implement a scheme in which IRRI is requested to submit in March of the year n a report over activities in year n-1, and to submit in September of year n a year plan for the year n+1. In addition, the Trust is advised to examine the possibility of transferring an advance payment early in the year to avoid cash flow problems at the GRC.	We welcome this	The new reporting schedule conforms to that proposed by the Review Panel. Our plan is to make two disbursements per annum. One associated with a 6-monthly report in July and the second to the annual PMI and financial report.
2. Accountability for GRC operations	Currently, responsibility for only a proportion of the supplies budget has been delegated to the GRC. All other expenditures are controlled largely by the DDG and finance office. As a result, there is limited flexibility for the GRC to determine and control the size of the expenditures and to opt for changes between budget lines in the course of the year. The team was of the opinion that financial responsibility (planning, monitoring and reporting) for GRC activities 1.1.1 should lie with the GRC, in order to optimize financial management of the genebank operations. The introduction of full cost recovery and of the One Corporate System would allow delegation of such responsibilities, which would be in the interest of IRRI as a whole. We recommend that IRRI management effect such delegation of responsibilities.	We expect to adopt this as far as possible with OCS	The Trust agrees fully with the reviewers' recommendation. The management of the budget by the Genebank Manager will be crucial to ensure that the genebank is managed efficiently within the budget identified by the Costing Study. We look forward to seeing how the adoption of the OCS will provide this level of accountability and to enable improvements and cost-efficiencies to be made by the Genebank Manager.
3. Planning of GRC activities	Whereas the GRC head is overseeing basic genebank operations covered under 1.1.1, the GRC activities on gene discovery, conservation research and data management are overseen by the GRiSP Theme 1 leader and managed by the leaders of each respective GRiSP Product Line (1.2, 1.3 and 1.4). As a result, a mechanism to co-ordinate and prioritize GRC activities is lacking, which may affect coherence and effectiveness of these activities. The review team strongly supports the integration of GRC activities within the GRiSP but also believes in the necessity of coherence and integration of activities within the GRC. We recommend that IRRI management ensure co-ordination and	GRiSP provides the coordinating framework for a global research partnership on rice. IRRI recognizes that this large-scale coordination should not be at the expense of tight integration of units within GRiSP. We will continue to promote effective co-ordination and priority setting in GRC as recommended.	Where the boundary lies between the genebank's own activities and ensuing activities should be decided according to the priorities of the institute or CRP. Conservation research, in particular, has a much greater and more direct impact on the genebank than any other possible activity within GRiSP. We will be keen to see, as the IRRI response indicates, that all of the activities that directly concern and influence the management of genebank are

	Recommendation	Responses by IRRI	Responses by Crop Trust
	effective priority setting in the GRC in the context of the new programme-based reporting structure recently introduced at IRRI.		carried out in a fully integrated and coordinated way.
4. Improving financial transparency	The team observed that, in addition to a breakdown according to the standardised grouping (direct research costs, research support services costs, operations/facilities costs, institutional costs) and according to category of spending (personnel, etc.), a financial breakdown of the budget and financial reporting along gross GRC activities (acquisition, regeneration, multiplication, viability testing, documentation, storage, distribution) would in particular help all stakeholders (GRC head, IRRI management, donors) to improve their understanding of genebank costs, thus facilitating optimal programme management. In particular, it would help the head of the GRC to draw a budget based both on available funds and on needs. The review team therefore recommends that IRRI present an alternative financial breakdown of expenditures to enable the GRC, as well as the Trust, to have a more complete understanding of how funds are expended on major genebank operations and items.	Achieving this is precisely one of the reasons for introducing OCS. We expect progress in this area during 2012	The template for financial budgeting and reporting follows CGIAR standards and will capture main GRC activities as recommended by the reviewers.
5. Renewing infrastructure and equipment	In its discussions at IRRI, the team referred to provisions in the costing study for the annualized cost (present value) of infrastructure and equipment. Appropriate management of the dedicated Consortium funds should allow the proper maintenance of infrastructure and essential equipment and the investment in new infrastructure and equipment for basic genebank functions over time. The review team recommends that IRRI, in communication with the Consortium and with the Trust, invest an appropriate allocation of funds for a capital fund dedicated to the genebank.	IRRI allocates capital funds dedicated to GRC	IRRI's response to this recommendation is welcome.
6. Developing the Global System	The review team recognizes the importance of harmonizing and sharing data of rice germplasm between the genebanks of IRRI, AfricaRice and CIAT, which is expected to be achieved in 2012 under GRiSP 1.1.4.1. This will allow verification and consolidation of the holdings in the CGIAR rice collections and contribute to the development of a rational Global System of Rice Genetic	We welcome this suggestion and will follow up further.	The Trust also welcomes this proposal as an important step towards developing a stronger, more integrated crop conservation system. ACTION: Partnerships and the specific nature that they take will be captured in

	Recommendation	Responses by IRRI	Responses by Crop Trust
	Resources. Aligned and harmonized quality management procedures and protocols will also form an essential element of such Global System. We recommend IRRI to take the lead in such endeavour and to explore and consider which activities and costs will be associated with the development of such a Global System for rice conservation. Amongst other initiatives, a visit of the head of GRC to AfricaRice could contribute to initiating such process.		PMI/I. There is a possibility to develop a special task on this point of developing a rationalized Global System for Rice. This can be raised at the Annual Genebank Meeting.
7. Regionalize distribution of seeds	The review team noted that distribution of seed samples requested from IRRI by African or Latin American users should be carried out as efficiently as possible. It noted the agreement between IRRI, CIAT and AfricaRice that where requested germplasm is available in the relevant centre, users should be served by the Centre in that region. The review team is of the opinion that this agreement might constitute a contribution to the development of a Global System. The review team recommends IRRI to take up consultations among the three Centres involved in order to ensure that the agreement between the three centres attains its goals effectively. The goal of such consultations should de to guarantee that such distribution arrangement will be logistically sound, serve the users best and not lead to unnecessary delays in delivery of germplasm.	We will follow up further to formalise and promote this informal agreement between the three centres	The Trust agrees with this sound recommendation ACTION: The above Action is relevant here as well.
8. Strengthening the Quality Management System	The quality of management and operations of the GRC are the best in the CGIAR. The GRC applies very high standards in its operations. It would, therefore, create a "Gold Standard" if the GRC completes and consolidates a fully documented quality management system for its basic genebank operations. The review team notes that attempts have been made in the past to establish this QMS but that the effort has not been completed. It is recognized that this will require additional investment of time and effort by the staff and external process documenters in preparing and implementing the QMS, but this process will be essential to capture the unique experience of the long-serving staff. The team recommends that IRRI make staff resources and necessary funds available with priority to complete full documentation of its	Agreed. We will look into promoting finalisation of the documentation of the quality management system	The Trust agrees that this is a high priority.

	Recommendation	Responses by IRRI	Responses by Crop Trust
	quality management system.		
9. Securing staff succession	The review team noted that some of the well-trained and skilled staff of GRC have been with the centre for more than 30 years. These staff members have provided the backbone of the operations of the GRC, and are currently assigned in various key operations without any obvious successor. Their future retirement or separation may cause the loss of important competence and expertise in the management of the operations of the GRC. We recommend IRRI to develop a succession plan as soon as possible to ensure un-interrupted service of the GRC.	Agreed. This fits well with IRRI's developing HR management strategy	This recommendation and IRRI's response is welcome.
10.1. Reducing transaction costs	The panel recommends that the GRC coordinate with the Trust to ensure that reporting format requirements of different donors (Trust, Consortium, others) and programs (GR programme and GRiSP) are harmonized as much as possible.	IRRI will work with the Trust to ensure efficient harmonized reporting Trust	We are working on the new planning and reporting templates with the GRC Head. These reports will aim to monitor the entire conservation and distribution functions of the genebank as well as any activities that improve these functions, as such there is some overlap with other GRiSP Product Lines. We hope that this can be accommodated.
10.2. Optimizing use of facilities	The issue of space availability has been raised during the review. The panel is of the opinion that the use of current facilities of the GRC can still be optimized to accommodate current operations by replacing old equipment, such as that serving the drying room and cold rooms, and by reconfiguring the current facility layout. The option suggested by IRRI to build a new, more cost-efficient and effective genetic resource facility (genebank and laboratories) might be in line with the future projected needs and role of the GRC under the GRiSP and other programmes and is supported by the review team. The review team suggests the conduct of a study and the development of a plan to optimize the current space available in the genebank and its immediate vicinity. The plan can be used in the short term and long term planning of the needs of the IRRI Genebank including the need for new facilities.	We agree that this is desirable.	The Trust takes note of this recommendation and looks forward to hearing the results of any study or plans for optimizing the use of the facilities.

EXECUTIVE SUMMARY

The Global Crop Diversity Trust (Trust) commissioned a review of the long-term grant for the conservation and availability of the rice collection held in trust by the International Rice Research Institute (IRRI) in Los Baños, Philippines.

The primary focus of the review was to assess the impact of the grant on the maintenance and availability of the rice collection held at IRRI which is to ensure a foundation for food security, and, if relevant, to provide recommendations for future activities for the IRRI Genetic Resources Centre (GRC) in fulfilling this role. Reviewers conducted a site visit of the genebank and assessed the genebank operations and impacts of maintaining and making available the rice collection held at IRRI.

The rice collection maintained by IRRI holds more than 114,000 accessions of rice, including modern and traditional varieties, and wild relatives of rice. It is the biggest collection of rice genetic diversity in the world. IRRI supplies free samples of the accessions in its collection to any prospective user on request, according to the terms and conditions of the Standard Material Transfer Agreement of the International Treaty. In the past five years, the GRC distributed 131,283 samples to 664 recipients in 64 countries.

The review team noted that the GRC had realized major achievements, based on funding from the Trust as well as from other sources, on the following topics: safety duplication, viability testing, characterization, documentation, distribution, and supporting research. It observed a strong integration between conservation and use of genetic resources and the demand-driven and product-focussed breeding programmes in the context of Global Rice Science Partnership (GRiSP), and an increased collaboration with the genetic resources units of AfricaRice and CIAT. GRC activities fit into GRiSP Theme 1, and in particular into GRiSP product line 1.1. Ex situ conservation and dissemination of rice germplasm.

The review team was impressed by the quality of the activities of IRRI GRC, and the commitment of its staff, and regards the IRRI GRC as a leading genebank. Recommendations to the Trust, to IRRI management, and to the GRC staff in the areas of financial and programme management, developing a global partnership, and technical operations serve to further enhance the functioning of the GRC.

The recommendations refer to

- early release of funding from the Trust,
- planning of and accountability for GRC operations within IRRI,
- improving financial transparency,
- renewing infrastructure and equipment for GRC operations,
- cooperation with CIAT and AfricaRice,
- strengthening the GRC Quality Management System, and
- securing GRC staff succession.

Further suggestions were made regarding

- ensuring transaction costs as a result of multiple funding sources are minimal,
- optimizing use of GRC facilities.

Bert Visser and Leo Sebastian, January-February 2012.

1. BACKGROUND

The Global Crop Diversity Trust (Trust) commissioned the review of the long-term grant for the conservation and availability of the rice collection held in trust by the International Rice Research Institute (IRRI) in Los Baños*, Philippines.*

The mission of the Trust is to ensure the conservation and availability of crop diversity for food security worldwide. This is achieved through providing secure in-perpetuity funding to ensure the long-term maintenance and availability of crop collections of global significance. Since 2006, the Trust has provided support to 18 crop collections (15 crops) by signing long-term grant agreements with 8 CGIAR Centres, one regional genebank and the Svalbard Global Seed Vault.

As part of the agreement, each grantee is required to submit technical, narrative and financial reports on an annual basis. The reporting obligation includes a multi-year budget, financial statements, a narrative report addressing specific areas, as well as a completed technical performance indicator report which measures the impact and status of the collections across specific parameters. Together these reports aim to monitor in detail the status, progress, and impact of the grant on the long-term conservation and availability of each crop collection. The focus of the performance indicators is on genebank operations and management.

In 2006 the Trust entered into a long-term agreement with the International Rice Research Institute (IRRI) for the conservation and availability of the rice collection held in trust. Under this agreement, IRRI has submitted annual performance and financial reports on the genebank activities related to rice conservation.

As stated in the grant agreement, a review of the grant activities may be commissioned by the Trust. In close cooperation with IRRI, the Trust commissioned an effectiveness review of the five-year grant provided for the maintenance and availability of the rice collection held at IRRI, with a focus on technical and quality performance aspects.

The primary focus of the review was to assess the impact of the grant on the maintenance and availability of the rice collection held at IRRI which is to ensure a foundation for food security, and, if relevant, to provide recommendations for future activities for the genebank in fulfilling this role.

The following sections of this report include: features of the IRRI rice collection and the GRiSP programme; the review approach; direct impact of the Trust's long term grant (LTG) on the conservation and use of the IRRI rice collection; other major observations, recommendations, and further suggestions. Annex 1 provides the review team's agenda.

2. FEATURES OF THE IRRI RICE COLLECTION AND THE GRiSP PROGRAMME

The IRRI collection

The rice collection maintained by IRRI holds more than 114,000 accessions of rice, including modern and traditional varieties, and wild relatives of rice. It is the biggest collection of rice genetic diversity in the world. Countries from all over the world sent their rice collections (collected by their national organizations or together with IRRI) to IRRI for safe keeping, and for sharing for the common public good. The GRC supplies free samples of the accessions in its collection to any prospective user on request, according to the terms and conditions of the Standard Material Transfer Agreement of the International Treaty. In the past five years, the GRC distributed 131,283 samples to 664 recipients in 64 countries.
Each accession is stored in both the base (-20˚ Celsius, long-term storage) and active (2-4˚ Celsius, for distribution) collections.

The species of rice include: a) *Oryza sativa* or Asian rice, which is the most commonly grown and eaten rice. It probably had its origin between the Himalayas and Indochina and contains two groups of rice: indica and japonica (including temperate and tropical japonica); b) *Oryza glaberrima* or African rice that originated in West Africa. It is not widely cultivated but has been used to breed other types of rice grown in Africa; c) Twenty-two wild species of rice that are found in Asia, Africa, Australia, and the Americas. Only a few are closely related to the cultivated species *Oryza sativa* and *Oryza glaberrima*.

Traditional varieties and the wild species of rice are being lost through genetic erosion. Many farmers tend to adopt new higher-yielding varieties, and stop growing the much broader set of varieties that they have nurtured for generations, eventually to lose these varieties. The wild species are threatened with extinction as their habitats are destroyed by human activity or climate change. At the same time, crop improvement needs the genetic variation from traditional varieties and related wild species to cope with the many biotic and abiotic stresses that challenge rice production around the world.

The Global Rice Science Partnership (GRiSP)

The work of the GRC forms an integral part of the newly launched Global Rice Science Partnership (GRiSP) of the CGIAR. The LTG of the Trust is contributing to the activities contained in Theme 1 of this programme, entitled “Harnessing genetic diversity to chart new productivity, quality and health horizons”, and in particular to product 1.1.1. Sustained and enhanced management of the rice collections of the CGIAR, part of product line 1.1. Ex situ conservation and dissemination of rice germplasm.

The GRiSP provides a single strategic plan and partnership platform for rice research for development.

GRiSP streamlines current rice research for development activities of the CGIAR and aligns them with more than 900 rice research and development partners worldwide to:
• Increase rice productivity and value for the poor
• Foster more sustainable rice-based production
• Help rice farmers adapt to climate change
• Improve the efficiency and equity of the rice sector.

3. REVIEW APPROACH

The review was undertaken in two phases:

Phase I: Desk Study to provide general background (2 days)

Materials reviewed included the following:
1. Long-term grant agreements;
2. Annual LTG reports submitted by IRRI;
3. Genebank Costing study;
4. CGIAR Plan and Partnership for Managing and Sustaining CGIAR-held collections;
5. Global Rice Science Partnership document (GRiSP)
6. Global Rice Conservation Strategy

Phase I of the review focused on objectives and activities of the long-term grants and the current progress. Reviewers were given access to relevant documents in an effort to provide a general picture of how the long-term grants play a key role in delivering the overall mission of the Trust.

The desk study reviewed the technical and financial annual reports submitted by IRRI to the Trust since the initiation of the grant. The review provided analysis of progress, trends and highlights of the reports, and an overview of the grant impact to date.

Phase II: Site visit to review IRRI genebank operations (5 days)

Reviewers conducted a site visit of the genebank and assessed the genebank operations and impacts of maintaining and making available the rice collection held at IRRI.

In particular, the review focused on the performance of genebank activities over the last five years, based on the guidelines outlined in the agreement (Article 3.3), and reported on within the framework of the Performance Reports:

1. Conserving and making available the IRRI-held collection through:
   a) Long-term storage management and curation of the IRRI-held collection in conformity with international standards (health, regeneration, etc.);
   b) Safety duplication of the IRRI-held collection;
   c) Characterization and evaluation of germplasm in the collection;
   d) Documentation of the germplasm and provision of data in publicly available information systems; and
   e) Distribution of germplasm in accordance with the International Treaty.

2. Furthering development of a global system for plant genetic resources for food and agriculture through:
   a) Extending the coverage of genepools *ex situ* (including analysis and gap-filling) in partnership with others;
   b) Providing training and capacity building;
   c) Partnering with other genebanks and networks in the context of creating a more effective and efficient global conservation system;
   d) Providing conservation services to others;
   e) Developing links to users and promoting use.

The review also investigated other genebank activities, operations, and achievements not captured in IRRI narrative reports to the Trust, including in particular the implementation of a quality management system, the linkages with GRiSP, and the GRC research activities supporting the conservation and utilization goals of the GRC.

4. DIRECT IMPACT OF THE LTG ON THE CONSERVATION AND USE OF THE IRRI RICE COLLECTION

It should be stressed from the outset that the achievements described below were based on funding from a range of sources. The support from the Trust has not been demarcated for specific activities or projects. The impact of the funding possibly relates most directly to the first point, the retention of staff, which allowed the other activities to take place.

Staff retention. The Trust's LTG had significant effects for the operations of the GRC. Among its immediate impact was the retention of staff whose contracts would have otherwise been terminated at the end of the GPG1 project. This retention contributed to the achievements cited below.

Safety duplication. The LTG contributed to GRC's success in completing the safety duplication of the collections in trust in Svalbard. New active duplicate collections stemming from regeneration

projects elsewhere (including Madagascar, Pakistan, Myanmar, Laos) supported by the Trust are also being incorporated into the IRRI collection.

Viability testing. In 2009 and 2010, viability testing was performed on 76,174 accessions, thus avoiding potential backlogs. As this proves to be a significant investment of time and resources, research is under way to examine ways of improving viability and determining most appropriate periodicity for testing.

Characterization. The basic morphological characterization of the entire genebank collection using the old IBPGR list of descriptors has now been completed. However, the descriptors have been updated and harmonized with UPOV and the breeders' Standard Evaluation System, leaving many gaps in characterization. Work is currently in progress to integrate characterization with the new global phenotyping network of GRiSP, and hence to respond better to user needs.

Documentation. The data in IRIS (International Rice Information System, encompassing both curator and breeder data and available for users) and GRIMS (Genetic Resources Information Management System, for international seed management) are being harmonized. GRIMS is now in full use and contributes to quality management as a direct result of its design to manage workflow. The integration of IRIS and GRIMS is demanding massive investments in data verification because of a lack of standardization and quality of breeders' data on the use of donor germplasm.

Distribution. A record high distribution of 11,433 samples to users outside IRRI and 20,544 samples inside IRRI was achieved in 2009 and 2011, respectively.

Increased supporting research. The LTG also allowed the reallocation of some unrestricted funds that would have otherwise been used for basic genebank operations in order to perform research on issues relevant for improving genetic resources management. During the review period (2006 – 2011), the GRC initiated research into seed management (e.g. aspects of regeneration, processing, storage, dormancy and characterization) and on exploring non-expressed diversity (by direct sequencing, gene discovery through crossings and allele mining). The development of the OryzaSNP "nano core" of 20 accessions has been completed.

5. OTHER MAJOR OBSERVATIONS

Diverse funding of GRC activities. The team observed that the implementation of full cost recovery as the basis for financial management of IRRI activities had a strong impact on costing the GRC activities. It noted that the total budget spent on GRC activities for 2011 was approximately US$ 1.4 million. Of this amount, US$ 270,000 was provided directly by the Trust, whereas the remaining amount was provided by the CGIAR Consortium based on the total cost of IRRI genebank operations determined in the Genebank Costing Study. A further $442,000 was made available (partly from the IRRI managed endowment fund) as per the Agreement between IRRI and the Trust, which was used to support improvements in the genebank. The head of GRC confirmed that the Trust Fund and the dedicated Consortium funding should support all necessary activities under category 1.1.1. of the GRiSP programme. The review team noted that it appeared virtually impossible to disaggregate costs for the genebank activities under GRiSP 1.1.1 according to specific grants and found the current Trust policy not to require such detailed allocation fully justified.

Integrating the development chain. The review team acknowledged the efforts of IRRI management to forge a strong integration between conservation and use of genetic resources and the product-focussed breeding programmes in the context of GRiSP. Such thrust is apparent in

the gene discovery research and in the enhanced collaboration between breeders and genebank staff in the use of genebank materials. A further strengthening of such integration and linkages is expected with the availability of genomic data and the tools to manage and analyse such genomic data. The review team shared IRRI's views on the need of such integration to achieve best use of the IRRI rice collection.

Staff performance. The nationally recruited staff of GRC showed excellent competence and skills in managing the routine and daily operations of the GRC. The wealth of knowledge and skills accumulated by the staff over the years regarding seed handling in the genebank, the management of the wild rice germplasm, and the field operations is very impressive. Such knowledge and skills are invaluable for the continuity of operations of GRC in the years to come.

Documenting GRC operations. The procedures and protocols for managing the collections, managing the data, and conducting the field operations are well in place in the GRC. The current protocols reflect the best practices and experiences as these have been refined over the years. The review team was of the opinion that the continued documentation of these procedures and protocols should be given more attention.

Cooperation with AfricaRice. The team noted that in recent years major progress in cooperation with AfricaRice had been made. It also noted that staff of AfricaRice especially valued cooperation in a planned collecting mission in East Africa, training offered by IRRI, support in improving quarantine procedures, as well as closer collaboration in the development and use of shared databases, such as IRIS.

6. RECOMMENDATIONS

Based on its review, the review team wishes to make a number of recommendations regarding the operations of the Genetic Resources Centre (GRC), which are listed below. These recommendations have been grouped into items related to financial and programme management, technical operations, and the development of the Global System. Based on the topic concerned, these recommendations are provided either to the Trust or to IRRI, both IRRI management and the GRC staff.

Financial and programme management

1. *Early release of funding from the Trust.* The review team noted that the funding from the Trust is usually released in a later period of the year because of reporting requirements. In order to better manage the programme cycle, the review team recommends that the Trust implement a scheme in which IRRI is requested to submit in March of the year *n* a report over activities in year *n*-1, and to submit in September of year *n* a year plan for the year *n*+1. In addition, the Trust is advised to examine the possibility of transferring an advance payment early in the year to avoid cash flow problems at the GRC.

2. *Accountability for GRC operations.* Currently, responsibility for only a proportion of the supplies budget has been delegated to the GRC. All other expenditures are controlled largely by the DDG and finance office. As a result, there is limited flexibility for the GRC to determine and control the size of the expenditures and to opt for changes between budget

lines in the course of the year. The team was of the opinion that financial responsibility (planning, monitoring and reporting) for GRC activities 1.1.1 should lie with the GRC, in order to optimize financial management of the genebank operations. The introduction of full cost recovery and of the One Corporate System would allow delegation of such responsibilities, which would be in the interest of IRRI as a whole. We recommend that IRRI management effect such delegation of responsibilities.

3. *Planning of GRC activities.* Whereas the GRC head is overseeing basic genebank operations covered under 1.1.1, the GRC activities on gene discovery, conservation research and data management are overseen by the GRiSP Theme 1 leader and managed by the leaders of each respective GRiSP Product Line (1.2, 1.3 and 1.4). As a result, a mechanism to co-ordinate and prioritize GRC activities is lacking, which may affect coherence and effectiveness of these activities. The review team strongly supports the integration of GRC activities within the GRiSP but also believes in the necessity of coherence and integration of activities within the GRC. We recommend that IRRI management ensure co-ordination and effective priority setting in the GRC in the context of the new programme-based reporting structure recently introduced at IRRI.

4. *Improving financial transparency.* The team observed that, in addition to a breakdown according to the standardised grouping (direct research costs, research support services costs, operations/facilities costs, institutional costs) and according to category of spending (personnel, etc.), a financial breakdown of the budget and financial reporting along gross GRC activities (acquisition, regeneration, multiplication, viability testing, documentation, storage, distribution) would in particular help all stakeholders (GRC head, IRRI management, donors) to improve their understanding of genebank costs, thus facilitating optimal programme management. In particular, it would help the head of the GRC to draw a budget based both on available funds and on needs. The review team therefore recommends that IRRI present an alternative financial breakdown of expenditures to enable the GRC, as well as the Trust, to have a more complete understanding of how funds are expended on major genebank operations and items.

5. *Renewing infrastructure and equipment.* In its discussions at IRRI, the team referred to provisions in the costing study for the annualized cost (present value) of infrastructure and equipment. Appropriate management of the dedicated Consortium funds should allow the proper maintenance of infrastructure and essential equipment and the investment in new infrastructure and equipment for basic genebank functions over time. The review team recommends that IRRI, in communication with the Consortium and with the Trust, invest an appropriate allocation of funds for a capital fund dedicated to the genebank.

Developing the Global System

6. *Cooperation with CIAT and AfricaRice.* The review team recognizes the importance of harmonizing and sharing data of rice germplasm between the genebanks of IRRI, AfricaRice and CIAT, which is expected to be achieved in 2012 under GRiSP 1.1.4.1. This will allow verification and consolidation of the holdings in the CGIAR rice collections and contribute to the development of a rational Global System of Rice Genetic Resources. Aligned and harmonized quality management procedures and protocols will also form an

essential element of such Global System. We recommend IRRI to take the lead in such endeavour and to explore and consider which activities and costs will be associated with the development of such a Global System for rice conservation. Amongst other initiatives, a visit of the head of GRC to AfricaRice could contribute to initiating such process.

7. *Regionalize distribution of seeds.* The review team noted that distribution of seed samples requested from IRRI by African or Latin American users should be carried out as efficiently as possible. It noted the agreement between IRRI, CIAT and AfricaRice that where requested germplasm is available in the relevant centre, users should be served by the Centre in that region. The review team is of the opinion that this agreement might constitute a contribution to the development of a Global System. The review team recommends IRRI to take up consultations among the three Centres involved in order to ensure that the agreement between the three centres attains its goals effectively. The goal of such consultations should de to guarantee that such distribution arrangement will be logistically sound, serve the users best and not lead to unnecessary delays in delivery of germplasm.

Technical operations

8. *Strengthening the Quality Management System.* The quality of management and operations of the GRC are the best in the CGIAR. The GRC applies very high standards in its operations. It would, therefore, create a "Gold Standard" if the GRC completes and consolidates a fully documented quality management system for its basic genebank operations. The review team notes that attempts have been made in the past to establish this QMS but that the effort has not been completed. It is recognized that this will require additional investment of time and effort by the staff and external process documenters in preparing and implementing the QMS, but this process will be essential to capture the unique experience of the long-serving staff. The team recommends that IRRI make staff resources and necessary funds available with priority to complete full documentation of its quality management system.

9. *Securing staff succession.* The review team noted that some of the well-trained and skilled staff of GRC have been with the centre for more than 30 years. These staff members have provided the backbone of the operations of the GRC, and are currently assigned in various key operations without any obvious successor. Their future retirement or separation may cause the loss of important competence and expertise in the management of the operations of the GRC. We recommend IRRI to develop a succession plan as soon as possible to ensure un-interrupted service of the GRC.

7. FURTHER SUGGESTIONS

Reducing transaction costs. The review team noted that several funding sources support the activities of the GRC. It also noted the potential for technical and financial reporting requirements from the part of different donors to present an excessive administrative burden upon GRC. The panel recommends that the GRC coordinate with the Trust to ensure that reporting format requirements of different donors (Trust, Consortium, others) and programmes (GR programme and GRiSP) are harmonized as much as possible.

Optimizing use of facilities. The issue of space availability has been raised during the review. The panel is of the opinion that the use of current facilities of the GRC can still be optimized to accommodate current operations by replacing old equipment, such as that serving the drying room and cold rooms, and by reconfiguring the current facility layout. The option suggested by IRRI to build a new, more cost-efficient and effective genetic resource facility (genebank and laboratories) might be in line with the future projected needs and role of the GRC under the GRiSP and other programmes and is supported by the review team. The review team suggests the *conduct of a* study and the development of a plan to optimize the current space available in the genebank and its immediate vicinity. The plan can be used in the short term and long term planning of the needs of the IRRI Genebank including the need for new facilities.

ACKNOWLEDGEMENTS

We wish express our appreciation to IRRI, and in particular to Dr. Robert Zeigler (Director General) and Dr. Achim Dobermann (Deputy Director General), for extending its full support for and cooperation with the review. We thank Dr. Ruaraidh Sackville Hamilton, head of the TT Chang Genetic Resource Center, and GRC staff for arranging the program and the necessary logistical requirements for the review. We are also grateful for the active participation of the GRC, Finance, SHU, RQMS and other staff in the review.

Annex 1. Review team agenda

Day	Issues to be addressed	IRRI Participants	Start	Persons	Activity
Tue 31 Jan			7:45		Bus Guest house to IRRI
			8:00		Preparation
	Introduction, opening session, field tour	Bob Zeigler, All GRC staff, plus other involved and interested IRRI staff	9:00	Ruaraidh	Open
			9:00	Charlotte	Chair
			9:05	Bob	Welcoming remarks
			9:15	Bert	Introduction and objectives
			9:30	Charlotte	Q&A
			9:45		Coffee
		GRC professional staff	10:00	Ato Reaño	Tour of regeneration plots
			11:00	Soccie Almazan	Tour of wild rice screenhouse
			12:00		Lunch
	Financial reporting, illustration of FCR in action, OCS and any issues from the costing study	Finance Dept staff for LTG, window 1, costing study, FCR, OCS. + Ruaraidh	13:15	Sunil Jhunjhunwala	Presentation on financial system
			13:30		Discussionwith finance staff
	CGIAR in the global system: rice conservation in the CGIAR	Ruaraidh, Fiona, Ken, Pola	16:30	Ruaraidh	Presentation of joint IRRI, CIAT & AfricaRice workplan
			16:45		Discussion
			17:15	Kayode Sanni & Takashi Kumashiro	Conference call to AfricaRice
			18:00		Bus to Guest house
Wed 1 Feb			7:45		Bus Guest house to IRRI
			8:00		Preparation
	GRiSP and the genebank: linkages to improving use	DG, DDGR, theme leaders, theme 1 product team leaders, GRC professional staff other interested staff	9:00	Charlotte	Chair
			9:05	Achim	GRiSP: GRiSP theme 1
			9:35	Eero	GRiSP theme 2
			10:05	Coffee	
			10:20	Ken	GRiSP 1.2 & 1.3: genotyping, sequencing, pre-breeding
			10:40	Mau	Informatics for sequencing
			11:00		Group discussion
			12:00		Lunch

	Review of LTG over the last 5 years	GRC + SHU professional staff	13:00	Pola de Guzman	Tour of genebank + seed testing lab
			14:00	Pat Gonzales	Tour of SHU
			14:30	Ken McNally	Tour of molecular research lab
			15:00		Coffee
			15:15		Introductions to professional staff
			15:20	Ruaraidh	Presentation: Overview of GRC
			15:40	Pola de Guzman	Presentation: genebank
			15:50	Ato Reaño	Presentation: field operations
			16:00	Soccie Almazan	Presentation: wild rice
			16:10	Grace Capilit	Presentation: data management
			16:20	Pat Gonzales	Presentation: SHU operations in LTG / window 1
			16:30		Interviews - single or group
			17:15		Bus to Guest house
	The global system: IRRI and CIAT	Ruaraidh	20:00	Daniel Debouck & César Martinez	Conference call to CIAT (Guest House)
Thu 2 Feb			7:45		Bus Guest house to IRRI
			8:00		Preparation
			9:00	Fiona	Presentation: GRiSP 1.1.2-1.1.3 improving genebank operations, with emphasis on cultivated rice
			9:45		Discussion
			10:30		Coffee
			10:45	Fiona	Presentation: Conservation of wild relatives: current standards (1.1.1) and improving them (1.1.3)
			11:00		Discussion
			12:00		Lunch
		All interested IRRI staff	13:00		Preparation for seminar
			13:15	Bert Visser	Seminar
	Seed health & SMTA	SHU staff, Ruaraidh, Pat Gonzalez Pola, Monet	14:30		Group discussion: Seed health & use of the SMTA
			15:30		Coffee
	GRiSP and the genebank:	Ruaraidh, Pola, Grace, Beth,	15:45	Ruaraidh	Data management strategy

	improving data management	William	16:00	Grace	Presentation of GRIMS
			16:15		Group discussion: data management
			17:15		Bus to guesthouse
			17:30		Preparation
		By invitation	18:00		Dinner
Fri 3 Feb			7:45		Bus Guest house to IRRI
			8:00		Preparation
	GRC review	Genebank staff	9:00		Interviews and informal interactions
	IDR		12:00		Lunch
	Linkages with NARS (NPGRL)		13:15	Tess Borromeo	Interview
			14:30		Coffee
	Implementation and impact of the QMS	Menchu, Ato Other GRC professional staff	14:45		Interview
	Debriefing	Bob, Achim, Ruaraidh, Corinta	16:00	Bert Visser, Charlotte & Leo Sebastian	Discussion
			17:15		Bus to guesthouse
Sat 4 Feb	Presentation of preliminary recommendations and Wrap-up	Available GRC professional staff	98:30	Bert Visser, Charlotte & Leo Sebastian	Questions for review panel

Annex 2. Terms of reference of the review team

The review will provide an overview of grant activities and will deliver information on the status, impact and activities to date. It will examine specific areas of genebank operations, identified by IRRI or the Trust, that may require focused attention and deliver technical recommendations on the future needs/plans for the genebank in order to ensure the grant objectives are maximized.

The review may also provide feedback on the current reporting mechanisms used by the Trust for long-term grants (with potential recommendations for improvements).

Specific topics to be covered or illustrated include:

Past Genebank Reporting

- General review of genebank by assessing progress and status as reported in the five annual reports submitted to the Trust.
- General partnership and collaboration between Trust and genebank on providing leadership towards building a global system.
- Specific success stories and/or challenges facing the genebank in maintaining and making available crop collection/s.

Genebank Management and Operations

- Review of existing genebank quality management systems and provide recommendations on any gaps or improvements as appropriate.
- Review of activities and plans against specified grant objectives and provide technical advice and recommendations for managing performance and quality within budgets. Review may include additional specific operations/activities identified by the Trust and IRRI.
- Recommendations and suggestions to assist genebanks to collaborate and play a leadership role in building a global system for crop conservation.

Annex 3. List of persons involved in discussions in GCDT Long-Term Grant Review 31 January to 3 February 2012

A. List of IRRI staff

Name	Designation/Position	Division
Dr R.S. Zeigler	Director General, IRRI	
Dr A. Dobermann	Deputy Director General for Research, IRRI	
Dr E. Nissilä	Head, Plant Breeding, Genetics and Biotechnology Division and Programme Leader, GRiSP theme 2	PBGB
Dr W.P. Quick	Head, C4 Center	C4C
Sunil Jhunjhunwala	Head, Comptroller (In charge of finances of LTG)	Comptroller
Melba Aquino	Senior Manager, Financial Planning and Reporting	FPRU
Esmeralda Bactad	Officer, Financial Planning and Reporting (Accountant assigned to LTG)	FPRU
Dr. N.R. Sackville Hamilton	Head, T.T. Chang – Genetic Resources Center	TTC-GRC
Dr. K. L. McNally	Senior Scientist, Computational Biology (Genetic diversity research)	TTC-GRC
Dr. R. Mauleon	Scientist, Bioinformatics Specialist	TTC-GRC
Dr. F. Hay	Scientist, Genetic Resources Expert (Conservation research)	TTC-GRC
Flora de Guzman	Senior Research Manager (In charge, genebank management)	TTC-GRC
Renato Reaño	Senior Associate Scientist (In charge of field operations)	TTC-GRC
Ma. Socorro Almazan	Associate Scientist (In charge of wild rice)	TTC-GRC
Grace Lee Capilit	Senior Specialist – Database Administration (In charge of data management)	TTC-GRC
Ma. Elizabeth Naredo	Associate Scientist (Genetic diversity research)	TTC-GRC
Victor Ulat	Associate Scientist (Bioinformatics)	TTC-GRC
Lilibeth Sison	Specialist – Information Technology (GRIMS developer)	TTC-GRC
Jeffrey Detras	Specialist – Bioinformatics Data Curator (Bioinformatics)	TTC-GRC
Rolando Santos, Jr.	Specialist – Scientific Computing Support (Data management)	TTC-GRC
Ma. Celeste Banaticla-Hilario	Assistant Scientist (Wild rice taxonomic authentication)	TTC-GRC
Marionette Alana	Researcher (Deputy in charge, genebank)	TTC-GRC

Name	Designation/Position	Division
Stephen Timple	Researcher (Conservation research)	TTC-GRC
Myla Christy Rellosa	Researcher (Genetic diversity research)	TTC-GRC
Frances Nikki Borja	Officer – Molecular Breeding Biology (Bioinformatics)	TTC-GRC
Nelia Resurreccion	Officer – Database Administration (Data management)	TTC-GRC
Teresita Santos	Officer – Administrative Coordination	TTC-GRC
Patria Gonzales	Head, Seed Health Unit	SHU
Carlos Huelma	Scientist, Seed Health Unit	SHU
Manfred Carlo Cardenas	Database manager, Seed Health Unit	SHU
Marichu Bernardo	Head, Risk Management and Quality Assurance Unit	RMQA

B. **List of UPLB staff**

Name	Designation/Position	Unit
Teresita Borromeo	Professor, University of the Philippines Los Banos (UPLB)	National Plant Genetic Resources Laboratory (NPGRL)
Jose Hernandez	Director and Professor, UPLB	Crop Science Cluster