

Response from the Programme Steering Committee and the Management Team of the Generation Challenge Programme to the External Review report

The Programme Steering Committee (PSC) and the Management Team (MT) of the Generation Challenge Programme (GCP) would like to commend the Review Panel of this first GCP External Programme and Management Review (EPMR) for their clear and concise report. GCP recognises the relevance and perspicacity of most of the comments and all of the recommendations. This review was conducted in a very objective, transparent and professional manner, thus providing a welcome opportunity and firm basis for positive and necessary changes and reprioritisation, as GCP transits into Phase II. Implementing the recommendations presented in the report will enable GCP to improve its *modus operandi* and better organise its research portfolio, thus paving the way for the Programme's success in achieving its set objectives by 2013.

The overall message presented in the report of the Review Panel is fairly straightforward and succinct. Salient features include:

- better focus for the science,
- clearer definition of indicators of success to facilitate monitoring the progress of the Programme,
- a refinement of the management structure to ensure that GCP is not Subprogramme but Programme end-products driven,
- ensure the sustainability of GCP products after GCP's lifetime,
- proceed with reforming the governance structure, and
- monitor and carefully manage indirect costs.

Our short and bold response to the overall message and report is: "GCP is pleased by the overall positive tone of the report, it endorses all the recommendations and is committed to implementing them broadly along the timeline suggested in the report".

Our detailed response is presented below.

General Comments:

The specific purpose of GCP is to explore plant genetic diversity and apply advanced genomics and comparative biology to improve plant breeding for CGIAR mandate crops in drought-prone environments.

As indicated in our recent [Strategic Framework](#), by 2013 GCP is expected to have contributed to the following objectives:

1. Provide access to, and promote the use of, genetic diversity in plant improvement programmes.
2. Develop a public platform of genetic and genomic resources and tools, and support a global community that can use them.
3. Generate and apply knowledge across crops, and demonstrate the potential of comparative genomics to improve plant breeding programmes.

4. Use genetic diversity and advanced science to develop products for plant breeding programmes to improve the livelihoods of resource-poor farmers in drought-prone environments.

From the report, GCP appears to be on track for objective 1. The report summary states: *“Analyses of diversity in several germplasm collections are nearly complete; and its assembly of Reference sets for these species represents a significant outcome from Phase I of this CP. These Reference sets will help focus gene discovery and trait improvement research for the foreseeable future. The GCP has contributed considerable scientific information on genetic diversity and genetic underpinnings of some important traits.”* GCP reference sets are a subset of large germplasm bank collections that contain accessions (chosen using information about origin and pedigree and molecular markers) representing as far as possible the genetic diversity of the entire gene-bank collection.

Also with regard to objective 2, GCP appears to be on track. The report summary reads: *“GCP has developed genotyping-, informatics- and some genomics-platforms. GCP has arranged access to other genomics platforms and has developed processes to permit staff at many locations to participate actively in GCP research projects.”* The Review Panel also recognises GCP’s efforts in developing a vibrant scientific community all along the pipeline of GCP activities: *“GCP has developed an extensive consortium partnership and leveraged its resources to establish a broad network of R&D participants with extensive capability and capacity to support GCP objectives.”* And in the conclusion: *“Perhaps the most important value of GCP thus far, is the opportunities it has provided for people of diverse backgrounds to think collectively about solutions to complex problems and in the process to learn from one another.”*

Objective 3 is not considered directly in the report as it is fairly specific and in fact relates to a subset of GCP research activities.

However, the Panel is much more critical when analysing progresses achieved thus far to accomplish objective 4, the most crucial one for impact on crop improvement in GCP target environments.

It is important to underscore that the Review Panel does not question the quality of the science conducted in GCP: *“It is clear from the high quality of the journals in which most of the articles appear that the science being conducted under the auspices of the GCP is of a high quality and the outputs are recognized by peers”* (section 3.5: publications).

The major concern raised by the Panel is that the current research portfolio lacks adequate focus and the Programme appears to be rather opportunity-driven, without a clear end-product orientation and vision at Programme level. A main reason for that situation is the Programme’s current management structure: *“It is important to note that the current management structure is oriented along sub-programs, favoring prioritization of activities within Sub Programs but not across Sub Programs. While being a structure that supports excellence in scientific research by providing the possibility of selecting the highest-quality projects within each Sub Program, it does however not structurally*

support any integrated and harmonized approach across the different Sub-Programs with end products of the whole program in mind”(Section 5.3.1). Finally, there are currently no indicators of success to evaluate performance at Programme level by 2013.

GCP recognises and is aware of these weaknesses, and the criticism is well taken. The Science Council in their comments on GCP’s Medium-Term Plan (MTP) had previously pointed out this weakness in focus and questioned connectivity across Subprogrammes. The Management Team has been trying over the last two years or so to better focus the research portfolio and implement the Programme vision to improve continuity across Subprogrammes. To this end, a strategic framework has been developed that includes mechanisms for determining GCP’s priority farming systems, based on the coincidence of high poverty and drought. The GCP-commissioned ‘reference studies’ provide data on GCP’s impact targets. These data are taken into account by the Management Team to make informed decisions when implementing the GCP strategy. One of them—the [Targeting Impacts paper](#) by Glenn Hyman et al—identified 12 crops and 15 farming systems based on the number of stunted children and seasons of crop failure. This complementary targeting combining crops and farming system will be further refined based on the seven crop-traits to be selected (see response to recommendation 9). The inclusion of Crop Leaders (detailed in response to recommendation 9) will help to operationalise and seamlessly integrate this complementary crop–farming system approach.

Since 2007, all new commissioned projects on genetic gain for specific crops have focused on the crops and the farming systems identified by Hyman et al. This effort to sharpen the focus of our research portfolio is also reflected by the evolution in our calls for competitive grants. The first call was rather generic while the second call was an ‘oriented call’ with clear research themes. Finally, our ongoing third call closing in mid-March 2008 also defines clear research themes and focuses entirely on drought tolerance.

All the above notwithstanding, GCP wholly agrees that there is still a long way to go; that we do not as yet have completely clear end-products in mind, with related indicators of success; and that it is important for the Programme to allocate significant resources to a few flagship projects if we want to ensure impact in key crops. GCP must go beyond identifying success cases at Subprogramme level and demonstrate the value of going through the entire GCP chain of activities to impact on plant breeding; from discovering germplasm diversity to identifying genomic regions of interest; to the development of markers related to the expression of traits of interest; and finally to the use of those markers in national and local breeding programmes to improve local adapted germplasm.

GCP is pleased that the Review Panel devoted considerable attention to the potential impact of the Programme and on how to evaluate this impact in an objective manner. GCP welcomes the orientation towards a more private-sector approach where workplans are defined and adjusted to ensure delivery of specific end-products. However, as we redefine and implement our scientific strategy based on the Panel recommendations, we will keep in mind that GCP is a public-good international Programme that should—and

indeed must—preserve and accelerate gains from the good momentum of the research community it has nurtured since the Programme’s inception.

Issues related to governance and finances will be addressed in the next section.

Specific responses to the EPMR recommendations:

- 1. The review panel recommends that GCP establish simple program-level success criteria to provide GCP Management Team the means to focus, measure and monitor GCP program effectiveness.**

GCP endorses this recommendation, and establishing pragmatic but robust Programme-level success criteria will be a top priority for the rest of the year.

Broadly speaking, GCP activities can be divided into four categories aiming to:

- characterise crop diversity and develop genetic resources,
- develop technology platforms and informatic tools,
- support and enable capacity-building and GCP product delivery, and,
- achieve genetic gain to improve crop productivity for GCP target crops and environments.

These categories are of course tightly interconnected, generating products for different users along the entire pipeline of GCP activities, but also outside GCP. The first three kinds of activities described above are mostly platform-oriented, focusing on resources and services. Therefore, complementary indicators of success related to frequency of use and access to these platforms over time should be considered, recognising that platforms are only effective when they are actually used, and that their value and relevance are indicated by both ease as well as frequency of use. The fourth kind of activity is more crop- and environment-specific. In this case, indicators of success can be defined per crop, and should take into consideration both frequency and intensity of use, as well as geographic distribution of GCP products in breeding programmes in the South (e.g. markers, improved germplasm).

- 2. The review panel recommends that GCP management establish and apply a prioritization process to identify its highest impact opportunities that GCP (program-level) can actually achieve and deliver to appropriate impact channels during its remaining 6-years.**

GCP agrees with the recommendation that prioritisation is an absolute requirement to implement recommendations 1 and 3.

This prioritisation will build on existing GCP reference studies (e.g. the Hyman et al study mentioned above), new information to be generated based on needs plus feedback from GCP stakeholders. Different internal and external factors will also be taken into account in the prioritisation of GCP programme-level end-products.

Factors that GCP will consider include:

- The achievements and perspectives of GCP projects to date.
- The ‘landscape’ of our different partners and their individual expertise.
- For GCP target crops and environments, the existing breeding capacity and actual links with the breeding community.
- Harmonisation with the efforts and objectives of other international and national partners in crop R&D (e.g., initiatives supported by the Bill & Melinda Gates Foundation) for value-adding and also to ensure there is no duplication of efforts.

The prioritisation process *per se* will be determined later on as the MT needs to critically reflect on the best possible approach to identify the elements to take into account.

3. The review panel recommends that GCP deploy the majority (at least 50 %) of its resources in pursuit of the seven highest impact program-level trait-in-crop products that it can achieve over the next 5-years.

GCP supports this recommendation in principle. As indicated above, GCP is committed to sharpen the focus of its research objectives to ensure impact through selected case studies. This recommendation therefore aligns well with our own projections.

Turning to the timeline, implementing this recommendation will however require some flexibility for smooth readjustment. We consider summarily terminating ongoing activities mid-contract highly undesirable. This would erode our credibility and the team spirit, engagement and support of the GCP community. Discussing our concern with Review Panel members, the Panel confirms they do not expect us to stop ongoing projects.

However, GCP commits to identifying 7 highest impact programme-level trait-in-crop products and related activities by the end of 2008, with clear indicators of success (see answer to recommendations 1 and 2). Building on existing successful projects, we further commit to assign all future uncommitted resources allocated to research to attain as soon as possible the recommended threshold.

A final point on this recommendation. The end of section 4 of the report states:

“Among these, in the view of the Panel, a minimum of two products should also serve as case studies to define, refine, and assess performance and efficiency of the full range of GCP integration processes (minimally, gene discovery, functional genomics characterization, trait validation, and marker assisted introgression and trait or component pyramiding). These seven products (collectively) should involve no more than 5 crop species.”

If we endorse the two case studies as described here, and while not questioning the number of trait-in-crop projects, we might have to revisit the restriction of 5 crops, based on the output of our prioritisation exercise. Certainly, we would only advocate having

more than 5 crops where there is a strong rationale in the context of the 7 flagship projects.

- 4. The review panel recommends that GCP management in consultation of the curators of the source collections establish the protocols by which each GCP Reference Sets will be maintained and distributed; and the means by which the current genotypic data and passport (catalogued) information on these Reference Sets will be maintained and augmented by current and future (non-GCP) discovery efforts that employ these collections.**

GCP fully endorses this recommendation and significant resources will be allocated in 2008 to start implementing it.

Most, if not all, GCP activities aim at generating usable products—in both the short and long term—in the form of knowledge, materials and tools for plant breeders. We are committed to promoting and disseminating these products among users that are ready to apply them, thus helping to further GCP's mission. GCP is a time-bound Programme that should ensure continued and sustainable use of its products after its lifespan. Therefore, our commitment to establishing protocols by which GCP products can be maintained and distributed extends beyond the Reference Sets.

One of the projects commissioned in 2008 is a workshop where all the research steps that led to the Reference Sets will be described and discussed, as well as the perspectives and the steps necessary for taking full advantage of these products. This will be a scientific and capacity-building workshop, with the purpose of sensitising germplasm curators and breeders. It will be organised in concert with various players in international programmes related to germplasm management and will thus promote global coordination and co-operation. The players involved include the System-wide Genetic Resources Programme (SGRP) of the CGIAR, the Global Crop Diversity Trust and the Global Partnership Initiative for Plant Breeding Capacity Building (GIPB).

The Management Team is currently exploring ways and means to promote and ensure the sustainability of GCP products through supply and support services. Over the coming months, the Management Team plans to present (to the governance body) options and related workplans for a proposed a Plant Breeding Supply and Support Service (PB3S). The objective of this initiative is to create sustainable breeding support as an international public good to facilitate access by plant breeders in the South to new alleles and cost-effective modern plant science technologies, focusing on GCP products. The objective is that the majority of the services become self-sustaining from a financial point of view (user will pay for the services) by the end of GCP's lifetime (2013).

As indicated in the recommendation, it will be critical to consider the input of the different GCP partners—especially genebank curators for the distribution of germplasm—when defining PB3S functions and *modus operandi*. The service (PB3S) should ensure quality, timely distribution and easy access to GCP products through standardised procedures. It should play the role of an honest broker to facilitate the

exchange of products among partners, and reduce transaction costs by complementing existing lines of distribution without however competing with services offered by our partners.

- 5. The review panel recommends that GCP management revisit the skills training aspect of SP5 and focus skills training on the specific needs of the case studies and highest priority trait improvement projects.**

GCP agrees with this recommendation, and is already moving in the direction of the recommendation as indicated below.

Skill training was the focus of SP5 at the beginning of the GCP for several reasons: 1) at the time, there were insufficient and/or inappropriate links between the upstream research of Subprogrammes 1–4 and the national programmes, and 2) there was a need to establish SP5 to attract, prepare and retain a core of national programme scientists to become partners of our research by equipping them with the skills and expertise GCP would soon require. In 2006, training changed to cover the specific requirements of our national programme partners, as was expressed in that year's Annual Research Meeting (e.g. discussions in the phenotyping session). Moreover, the training programme adapted to the new environment, i.e., more national programmes became active partners in GCP research projects, and a [Delivery Strategy](#) had been developed and adopted at the Programme level. The implementation of the Delivery Strategy calls for the prioritisation of capacity-building for GCP products users.

To complement this re-orientation, SP5 initiated in 2007 the [Capacity Building Support \(à la Carte\) Programme](#). This Programme is for tailor-made capacity-building covering training, technical backstopping and basic infrastructure, to fill gaps in GCP projects that could hinder full participation and adoption of research results for individual national programme teams. In addition, in its role of supporting the technical Subprogrammes, SP5's capacity-building initiatives will naturally also emphasise and prioritise the 7 crop-traits activities that will refine GCP's focus in the years to come. In Phase II, SP5 activities will be increasingly oriented to product–push or customer–pull.

- 6. The review panel recommends that during setup of the Executive Board a strong emphasis is placed on creating sufficient capacity and expertise for the Board to fulfill its duties, especially in**
 - **Setting strategic direction for the GCP;**
 - **Overseeing GCP finances and managing risks, also those relating to the host center.**

GCP appreciates the support of the Review Panel in endorsing the governance reform already initiated, leading to the current point where a decision has been taken to establish an Executive Board composed of experts without any institutional affiliation to GCP Consortium Members. The [Terms of Reference](#) of this proposed Board are embedded in the resolution adopted by the current governance body, the Programme Steering Committee, during its last annual meeting in December 2007. GCP is seeking a focused

and interactive Board of no more than 7 members, and, as indicated in the resolution: “*At least one member shall be selected from each of the following professional fields: science, finance, and corporate governance*”. It is our expectation that Board members will have the capacity to fulfil the roles as recommended by the Panel to provide good leadership and oversight on GCP’s strategic direction and the management of its finances and risks. Therefore, we fully agree with recommendation 6 and we will ensure that the Board members selected will match the expectations.

Once the new Board is in place, it will be critical to define the legal and fiduciary parameters and responsibilities of the GCP Board and the CIMMYT Board of Trustees, as well as how the two Boards will relate to each other, given that GCP has no legal persona. The output of that discussion could result in adjusting the current CIMMYT–GCP host agreement.

The shortlist of the potential candidates for the new Executive Board should be finalised by early April, and we hope to have a functioning Board before summer 2008.

- 7. The review panel recommends that an attempt is made to further simplify and clarify the GCP governance by adapting the consortium agreement to the de facto status quo and to clearly define the role and responsibilities of additional GCP governance bodies (the PSC, the PAC, the Stakeholder Committee).**

GCP agrees with this recommendation.

More than ever, it is now imperative to clearly define the roles and responsibilities of the Stakeholder Committee (SHC) and the Programme Advisory Committee (PAC), given the ongoing governance reforms. The GCP Management Team is currently working in collaboration with the newly appointed GFAR Executive Secretary, on revising the SHC’s terms of reference. In addition, the GFAR Executive Secretary is a member of the Selection Committee for the new Executive Board. The Board will have discretion on whether to revitalise the PAC or look for alternatives (e.g. consultants) to tap into for particular scientific expertise as and when required.

The PSC will have to redefine its role, internal *modus operandi* and interaction with the GCP Management Team. The PSC will also have to define its mode of interaction vis-à-vis the new Executive Board. As suggested in the EPMR report the option to merge the PSC and the stakeholder committee will be considered carefully.

With the roles, responsibilities and interactions among these different bodies better defined, the provisions of the Consortium Agreement should be revised and adjusted if necessary.

- 8. The review panel recommends that GCP upgrade all Sub-Program Leader positions to full time positions for the next three years. Since SP3 and SP5 Leaders already have full-time positions, this implies to move the Leadership**

of SP1, SP2 and SP4 from half-time to full time positions. [in order to provide the necessary management capacity for program-level management and the fulfillment of management duties in their respective SPs; and to avoid split responsibilities between the GCP and the SP Leaders' home institutions.]

GCP endorses this recommendation in principle.

As we increasingly move from establishment to implementation, greater 'hands-on' management (as opposed to classical leadership and visioning) at both Programme and Subprogramme levels is becoming more fundamental for GCP's success in meeting its objectives. GCP commits to move from half-time to full-time Subprogramme Leaders but only when current half-time SP Leaders, of their own volition, leave the Management Team.

- 9. The review panel recommends GCP management adopt an end-product orientation for GCP activities, i.e. the integration, alignment and prioritization of product oriented projects across Sub Programs in-line with high priority program-level product objectives. To support this, the review panel recommends that GCP management acquire or develop a product project portfolio management system to help it plan, monitor and manage its best opportunities (achievable high priority program-level objectives).**

While we fully endorse this recommendation, we also realise that its implementation will require further reflection and careful consideration.

GCP management is paying increasing attention to product management and delivery and has recognised over the past two to three years the need to reinforce links across Subprogrammes. We developed a product catalogue at Subprogramme level but we still do not have a completely clear picture of the end products that the Programme should deliver over the coming years and we are definitely lacking related indicators of success. This weakness has been brought into sharp relief by the Review Panel and is due, to a certain extent, to our current management structure: "*Subproject structure, funding and themes (project groupings) reflect technology-push or service-push orientation rather than product-push or customer-pull orientation*" (Section 3).

Recommendation 9 is not about erasing the current Subprogramme structure, as it has some value clearly recognised by the Review Panel: rather, it is to add a transversal axis across the Subprogramme dimension. This component must ensure that once our end products at Programme level and their corresponding indicators of success have been identified (see response to recommendations 1 and 2), there is a management function that will ensure suitable resource and activity prioritisation across Subprogrammes to deliver those end-products.

This ‘product/crop’-specific complementary management function that would help to integrate and prioritise across Subprogrammes (in addition to the priority farming systems) can be established through at least three facilitative options:

- 1) By ‘Crop Leaders’ that are based in NARS or similar institutions, as suggested by the Review Panel. In order to remain cost-effective, this additional function should not reflect new management positions, but rather be integrated into relevant commissioned work (section 5.2.2).
- 2) By Subprogramme Leaders shouldering this new responsibility and function. Thus, in addition to their current responsibility, Subprogramme Leaders will add a new crop leader responsibility, based on their scientific expertise.
- 3) By a combination of options 1 and 2: Seeking Crop Leaders from NARS when there is a gap of expertise in the MT.

The MT will evaluate these different options, and any additional ones, over the coming months so that we have this new end-product orientation by the end of 2008. The development of this ‘product/crop-specific’ management dimension must be closely connected with the identification of the 7 trait–crop flagship projects. The idea to have the crop leader identified from the stakeholders will be explored carefully.

The MT is alive to the challenges of the two-dimension matrix. But while aware of the potential pitfalls, the MT would still like to move in this direction, especially given that some of the challenges that bedevil the two-dimension matrix mostly apply to large relatively more hierarchical institutions, while GCP is a ‘flatter’ virtual network.

An early preparatory step in the pathway to realising a product portfolio management system as recommended is a workflow system that GCP started to develop at the end of 2007. This web-based system will aggregate project information (technical reports, products and outputs, etc) and integrate it with financial and other administrative and management information related to projects. It will be part of an overall Programme-wide online management information system.

Conclusion

In conclusion, this review comes at a very opportune time for GCP and largely mirrors the thinking and vision within GCP in terms of weaknesses in our structure and work, remedial and preventive measures to counter these weaknesses, and strategies and restructuring for the future if GCP is to accomplish its objectives. Having conducted foundation work, including molecular marker analysis of germplasm diversity as well as developing genomic resources for most GCP mandate crop is a distinct quantifiable output from the past four years. To demonstrate impact on breeding efficiency in the context of the priority farming systems already identified, GCP now needs to allocate more resources to support a smaller set of defined trait-crops. The management structure and approach which worked well in GCP’s foundation years will also need realignment to this new direction and vision, with GCP now approaching midpoint and its second and final phase.

Both the PSC and the EPMR panel have endorsed major governance reforms and the establishment of a more focused Executive Board as GCP's apex body. We are therefore optimistic that with this facilitative mechanism to buttress our work and visioning, the EPMR goals we have committed to can indeed be successfully accomplished within a reasonable timeframe before 2013, for impact on plant breeding spanning the entire chain of GCP activities from discovering genetic diversity to ultimately improve local adapted germplasm.