



Generation Challenge Programme CGIAR Challenge Programme Annual Report 2007

**Submitted by
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Generation Challenge Programme
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Acronyms and abbreviations

ACGT	African Centre for Gene Technologies, South Africa
ARI(s)	advanced research institute(s)
BAC	bacterial artificial chromosome
BecA	Biosciences Eastern and Central Africa
BIOTEC	National Center for Genetic Engineering and Biotechnology, Thailand
BMGF	Bill & Melinda Gates Foundation
CAAS	Chinese Academy of Agricultural Sciences
CG	See 'CGIAR'
CGIAR	Consultative Group on International Agricultural Research
CHF	Swiss francs
CIAT	International Center for Tropical Agriculture
CIMMYT	International Maize and Wheat Improvement Center
CIP	Centro Internacional de la Papa (International Potato Centre)
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement, France
DFID	Department for International Development, UK
DPKit	Delivery Plan Kit
EBI	European Bioinformatics Institute, UK
EC	European Commission
EMBL	European Molecular Biology Laboratory
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuária (Brazilian Agricultural Research Corporation)
EPMR	External Programme and Management Review
EST	expressed sequence tag
EUR	Euros
GBP	British pounds
GCP	Generation Challenge Programme
GFAR	Global Forum for Agricultural Research
GSS	Genotyping Support Service
IAU	Internal Auditing Unit (of the CGIAR)
ICARDA	International Centre for Agricultural Research in the Dry Areas
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IITA	International Institute of Tropical Agriculture
iMAS	Integrated Marker-Assisted Selection System
INRA	Institut National de la Recherche Agronomique, Morocco
IRD	Institut de recherche pour le développement, France
IRRI	International Rice Research Institute
JIC	John Innes Centre, UK
LGDP	Laboratoire génome et développement de plantes
LIMS	Laboratory Information Management System
MAB	marker-assisted breeding
MAS	marker-assisted selection
MB	molecular breeding
MTP	Medium-Term Plan

NARS	national agricultural research system
NIAS	National Institute of Agrobiological Sciences, Japan
NILs	near-isogenic lines
PAC	Programme Advisory Committee
PDG	Project Development Guide
PI	Principal Investigator
PSC	Programme Steering Committee
QTL	quantitative trait loci
R&D	research and development
RAP	Review and Advisory Panel
SCRI	Scottish Crop Research Institute, UK
SDC	Swiss Agency for Development and Cooperation
SEK	Swedish krona
SHC	Stakeholders Committee
Sida	Swedish International Development Cooperation Agency
SNP	single nucleotide polymorphism
SP	Subprogramme
SSR	simple sequence repeat
UCB	Universidade Católica de Brasília, Brazil
WARDA	Africa Rice Center

1. Executive summary

The Generation Challenge Programme (GCP), launched in July 2003, is a research and capacity-building network that uses plant genetic diversity, advanced genomic science and comparative biology to develop tools and technologies that enable plant breeders in the developing world to produce better crop varieties for resource-poor farmers. Thus GCP helps link ‘basic’ research with ‘applied’ science—to help make scientific innovations and new technologies relevant for resource-poor farmers, and to improve access by scientists and researchers in the developing world to technologies that can make plant breeding faster and more efficient. Designed as a two-phase 10-year initiative, GCP is now approaching the end of Phase I, which runs from 2004–2008. Phase II will be 2009–2013.

Activities are organised under five Subprogrammes (SPs):

- SP 1: Genetic diversity of global genetic resources
- SP 2: Genomics towards gene discovery
- SP 3: Trait capture for crop improvement
- SP 4: Bioinformatics and crop information systems
- SP 5: Capacity-building and enabling delivery.

In its fourth year, GCP had a total of 113 projects within the five SPs. Of these, 22 were funded by competitive grants, 90 were commissioned, and one—a new project on tropical legumes—was a special project.

Our strategy has evolved through time, in step with the dynamism in the priorities and needs of our mission. Our overall [Strategic Framework](#),¹ defined in 2006, guided activities and determined priorities in 2007, as well as informing the selection of commissioned projects for 2008. Key features of research in 2007 were: better integration of activities across SPs 1, 2 and 3; more focus on key strategic crops and target regions for SP3 projects; promotion and utilisation of the first GCP products; greater participation of breeders in GCP projects; and an increasing leadership role by scientists from national programmes.

As we implement the strategy, the shape and focus our Subprogrammes is evolving, as outlined in section 2.2 of this report. We now have a clearer and improved focus on improving drought tolerance, as will be demonstrated by the research themes of our 3rd call for competitive research, which go out in early 2008.

In the year under review, we went beyond results at the Subprogramme level, and began to make real impacts on crop improvement. Our pathways to impact included, among others, molecular marker analysis of germplasm diversity for most GCP crops, increasing access to intra-crop genetic diversity, developing new markers to improve breeding efficiency for drought-prone environments, and improving phenotyping approaches and protocols.

In addition, the searchable [GCP Central Registry](#)² listing all datasets from GCP projects is now online to facilitate information sharing and data management. In 2007, also launched a special project to improve tropical legumes for sub-Saharan Africa. Other accomplishments in 2007 included, among others:

- producing rice introgression materials with high genetic resolution, and making the same accessible for phenotyping and trait tagging;

¹ Strategic Framework at: http://www.generationcp.org/comm/gcp_framework_final.pdf

² Central Registry at: <http://gcpcr.grinfo.net/>

- identifying—and transferring to national programmes—gene-based and linked markers diagnostic for rice salt tolerance and phosphorous uptake;
- the release of iMAS (Integrated Marker-Assisted Selection System)—a bioinformatics tool for breeders conducting MAS; and
- establishing a large R&D community to improve legumes for Africa and coordinate initial activities.

GCP strives to develop usable products in the form of knowledge, materials and tools for plant breeders. To achieve this, we develop appropriate and need-based tools. For example, a Delivery Plan (DP) is now required for every new major project (defined as projects with a budget of USD 250,000 or more). To ensure cogent and consistent DPs, in 2007, we developed a [Delivery Plan Kit](#) (DPKit)³ with a dual purpose: the DPKit is simultaneously a support tool for researchers, as well as a monitoring and evaluation (M&E) tool for research managers. The DPKit was immediately used starting with the seven projects initiated in 2007. To ensure product delivery and relevance, DPs are a participatory exercise, formulated by researchers leading the projects, in direct consultation with the targeted users of their research products.

Moving from planning to products, the Annual Research Meeting was held in Benoni, South Africa in September, providing a consultative forum for reporting on products now emerging from GCP's research, but also picking up emerging issues in the arena in which GCP operates.

Data generated by the different GCP projects are also considered as a valuable product, and the Programme is committed to sharing these data as international public goods for public access at no cost. With an increasing amount of information generated by GCP's research activities, data quality control and data release are receiving more attention, in the context of product management and product delivery.

For GCP, another crucial aspect for product delivery and uptake is capacity-building for partners. In 2007 we completed sets of learning materials on crop diversity, on genomics and comparative genetics and on bioinformatics; provided training on topical policy issues; launched the 'Capacity-building *à la carte*' programme for teams working on applied research; awarded competitive fellowships and travel awards; developed and implemented project Delivery Plans using the DPKit; tested the Genotyping Support Service; and pioneered a community of practice approach for rice with partners in Asia.

The number of visitors to the GCP website in 2007 averaged about 60,000 hits per month, while *GCP News*, an electronic newsletter, reached about 2,000 subscribers. In 2007 GCP also raised awareness by participating in several international events, including the annual Plant and Animal Genome Conference in San Diego (USA) in January and BioAsia 2007 in Bangkok (Thailand) in November.

The Programme Steering Committee (PSC) was GCP's main governing body during 2007. However, this year witnessed the start of a restructuring of GCP's governance. The PSC resolved at its December 2007 meeting to transfer substantive governance to an independent Executive Board, which becomes operational in June 2008. The Board's primary responsibility will be to provide oversight on GCP's strategic direction, as well as to assess finances and risk environment. As part of the reform process, the PSC will define its mode of interaction *vis-à-vis* the new Executive Board, and also redefine its role, internal *modus operandi* and interaction with

³ DPKit at: http://www.generationcp.org/sp5/?da=08122719#dp_kit

the GCP Management Team. The roles and responsibilities of two advisory committees—the Stakeholders Committee and the Programme Advisory Committee—will also be redefined.

The first GCP External Programme and Management Review was conducted in 2007, and its final report will be published in 2008. The review recommendations will feed into GCP's efforts to improve its *modus operandi*, and also to better organise and focus the research portfolio as GCP moves into Phase II.

The EPMPR acknowledged GCP's role in forging and nurturing partnerships, and leveraging our collective resources to establish an even broader network of R&D participants to support and help realise GCP objectives. The EPMPR Panel noted in its draft report: "*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.*"

Because GCP research is mostly 'upstream', it is critical to collaborate with organisations involved in large-scale plant breeding, seed multiplication and seed distribution, for impact in our [target regions](#).⁴ We need, as an example, to further consolidate our links with the Program for African Seed Systems (PASS), jointly funded by the Bill & Melinda Gates Foundation and The Rockefeller Foundation. GCP will enhance collaboration with small- and medium-sized enterprises, including the private sector and any other organisations to ensure product delivery to, and capacity-building for, Africa and South and Southeast Asia. Working with the private sector is critical for GCP, and we take a case-by-case approach to reflect the nature of each partnership.

From a financial perspective, 2007 was a year of mixed fortunes, but overall with a happy ending. The uncertainty was not due to funder doubts but related rather to measures to ensure a good match between receipt of contributions through the year and our calendar for disbursing funds, based on our workplan. Fortunately the payment schedule did not greatly hamper our projected 2007 workplan; we reorganised our disbursements to avoid cash-flow problems, and finished the year with a clean bill of health. In fact, 2007 registered our highest income ever since the inception of the Programme due to several factors as explained in the Financial report. In 2008, we should see a return to our standard situation, with a projected income of about USD 16 million.

⁴ A brief on GCP's target regions, and the 12 crops associated with these regions is at: http://www.generationcp.org/gen.php?da=08128238#gcp_target-crops