Country report Mexico

1. Executive Summary

2. Introduction

Given the importance of the Generation Challenge Programme (GCP) in terms of research support and EU allocated budget for this programme, the mission has been undertaken in the GCP office, hosted at the International Maize and Wheat Centre, Mexico City, Mexico (CIMMYT) in Texcoco/Mexico. The expert was previously informed that the GCP Sub-Programme 5 was upstream by mandate, therefore the impact evaluation focused on the effective achievements of the GCP5, and its potential impact downstream when products will be delivered to the farmers. However it is clear that many achievements carried out by the GC partners have already generated considerable impacts, especially because many CGs and NARS are very concerned by the final outputs at farm level. In many cases these institutions have expressed their interest in tracking the products and in some cases certified seeds have already been delivered to poor farmers. The GCP team has been very cooperative in providing all information and has delivered very professional inputs to the consultant. An improvised brainstorming meeting has taken place at the end of the week on possible perspectives for the programme phasing out.

3. Impact Evaluation

3.1. Project 1 GCP SP5

CGIAR Generation Challenge Programme GCP, Sub-Programme 5 (SP5). GCP is subdivided into 5 sub-programmes of which the SP5 which is mandated to deliver products from GCP's four technical Projects SP1 to SP4, from research to application. The present evaluation is exclusively focusing on the SP5.

- SP 1: Crop genetic diversity
- 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

3.1.1. Passport information

SP5 is undertaking the delivery process through building technical capacity of research institution partners and NARS in the selected countries, especially because NARS are supposed to be the main recipient of the GCP products, but also because they are not only the major beneficiary of training activities, but they will act as trainer in the south-south component. Actually GCP is acting as broker for the partner institutions, bridging the gap between upstream and applied science and improving NARS' research capacity to deliver product to resource-poor farmers. Therefore under its current contractual obligation GCP is operating upstream.

SP5 was launched in 2003 for a 10-year framework with two phases (2004–2008 and 2009–2013) up to the transition phase in 2014. The annual budget is about US$15M and major donors in alphabetical order are: the Bill & Melinda Gates Foundation, DFID, the European Union, Switzerland and the World Bank. The European Union is the main donor after the Bill & Melinda

Gates Foundation which operates quite independently. The target areas are the harsh drought-prone environments of sub Saharan Africa, South and South East Asia, and Latin America.

The main objective is "To use genetic diversity and advanced plant science to improve crops for greater food security in the developing world". As formulated initially in the Medium-Term Plan 2005-2007, the SP5 has two dimensions: *One is to better enable GCP members to carry out this cutting edge research agenda. The second is to empower national program scientists to participate in GCP activities. In combination, these two activities create mechanisms by which GCP products can reach crop improvement programs and farmers*. The SP5's purpose is "to conduct activities in direct support of the GCP scientific Sub-programmes, by building technical capacity for the efficient implementation of GCP research, and by facilitating the flow of GCP products through the research–delivery continuum to ensure that GCP outputs reach the anticipated users". The SP5's purpose of the Medium-Term Plan for 2008–2010 will be achieved through five outputs[1]:

Output 1. Creation of a platform of training resources and a cadre of trained scientists to apply advanced technologies and add value to GCP products
Output 2. Cultivation of research and learning opportunities for GCP collaborators and NARS scientists to further the GCP mission and progress
Output 3. Construction of systems for ensuring product delivery
Output 4. Development and implementation of support services
Output 5. Ex ante impact analysis and impact assessment.

SP5 addresses international and national policy issues to facilitate delivery and ensure intellectual property, so as to ensure better decision-making and to guide prioritization and resource allocation. It also tends to stimulate scientific excellence to facilitate interactions between partners and boost technology transfers and product deliveries.

GCP is acting independently but hosted at CIMMYT as it has no legal status to operate as an institution. The GCP consortium comprises 18 members, of which[2] 5 ARIs, 9 CG, and 4 NARS, but the GCP network involving the private sector comprises about 60 institutes. As broker the organizational structure is actually very light, with one Director, 5 scientists, 4 Project Officers, 2 Communication, and 3 support staff. Since 2008 the good governance is ensured through a Executive Board (7 members), a Scientific Committee for Advisory, in charge of project monitoring /management, a Consortium Committee(CC) in charge of operational issues, and a Stakeholder Committee (SHC) in charge of strategies.

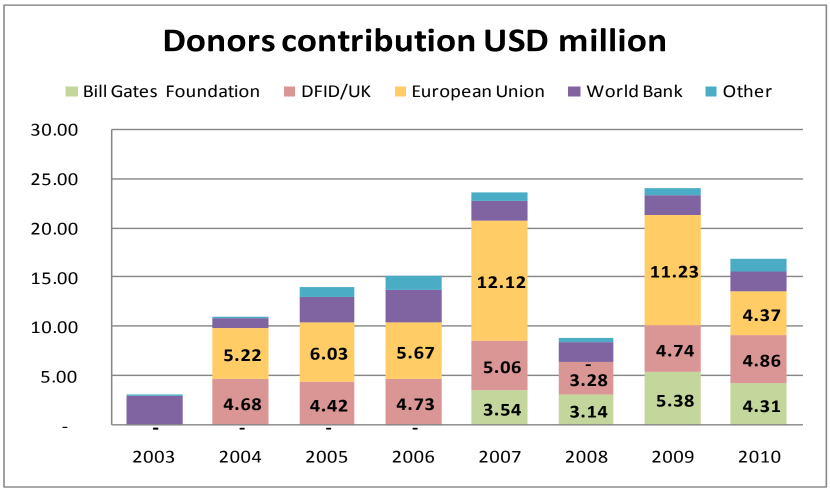
The GCP strategy involves seven Challenge Initiatives that have been selected in particular to improve drought, disease and salt tolerance, for cereals, legumes, root and tubers, and comparative genomics to improve cereal yields in high aluminum and low phosphorous soils.

CI1 (Cassava)	CI2 (Chickpea)	CI3 (Cowpea)	CI4 (Rice)	CI5 (Sorghum)	CI6 (Wheat)	CI7 (Al/LowP)
Nigeria	Ethiopia	Burkina Faso	Mali	Mali	China	Indonesia
Tanzania	India	Senegal	Nigeria	Ethiopia	India	Kenya
Ghana	Kenya	Mozambique	Burkina Faso	Sudan		Zambia

GCP target regions are: Asia (including Central Asia) and Pacific Islands 45%, Latin America (inclusding Caribbean) 10%, Sub Saharan Africa 45%

[1] Themes in the MTP logframe
[2] 5 ARIs: Agropolis, Cornell U, JIC, NIAS and WU, 9 CG: Bioversity, CIAT, CIP, CIMMYT, ICARDA, ICRISAT, IITA, IRRI, WARDA, 4 NARS: ACGT, CAAS, Embrapa, ICAR

The total budget since 2003 is USD million 116.7 of which 38% as EU contribution, as major contributor[3] with a total of USD million 44.7, for the whole programme. Therefore the annual average budget is about USD 15 million. The SP5 represents USD million 10.9 of which 78% as EU contribution.

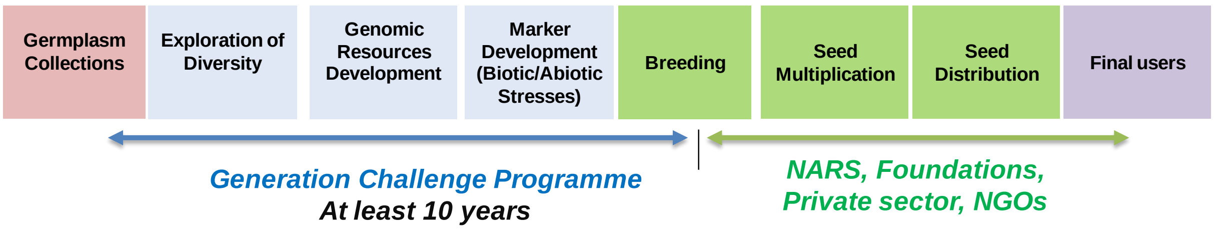


One of the major achievements during phase one was to bridge the gap between basic and applied agricultural science to provide new tools for plant breeding. Therefore ARI, CG and NARS have been involved together in most research projects. As consequence every GCP project must be conducted with a very clear vision of the needs and the potential users.

Delivery plans (Adopted by the EC), participatory research

3.1.2. Impact of the EU co-financed project on the livelihoods of the poor and on poverty reduction.

The initial focus of GCP was on SP1 and SP 2 until 2008, but has gradually evolved into a wider focus from SP3 to SP5 during the second phase. However, as illustrated in the research–delivery pathway below, direct GCP activities end at pre-breeding stage and it is estimated that this period will not take less than 10 years. NARS and private sectors will have to take over the post-breeding stage and ensure that delivery process will meet the target beneficiaries especially the poor farmers in drought-prone environments. Therefore it is estimated that all genomic resources that have been developed under the GCP period will not be available to dissemination to final users before 2013.



Potential impact

The potential impact of GCP-SP5 is very significant because it contributes to speed up the overall delivery plan through selected trains that target the poorest farmers living in drought prone area.

- The Integrated Breeding Platform IBP has been set up to provide adequate support tools, services and infrastructure to offer breeding programmes in developing countries access to modern phenotyping and genotyping technologies, including modern marker breeding technologies, that have been successfully deployed in the private sector but hardly used by the public sector in developing countries. IBP provides a wide range of services such as access to breeding services, e.g. accumulated crop information for predictive breeding or marker & trait services, informatics tools, capacity building, support for communities of

[3] Followed by DFID, the WB, Bill Gates and other donors (Kirkhouse, Pioneer Foundation, Rockefeller Foundation, Sweden/SIDA, Switzerland/SDC, Syngenta Foundation, and USAID)

practice. The integration of breeding database and training support provides adequate tools for performing and fast decision and management of the overall workflow of CGs and NARS, resulting in much faster delivery of improved germplasm and revitalization of new germplasm into seed systems.

- The Community of Practice (CoP), organized and structured groups Share tacit knowledge and solve common problems, to take advantage of the enormous steps made in molecular breeding, and low cost of genotyping to introduce MAS in their programmes, existing CoPs (Cassava Africa, Rice Asia), Services to be offered by IBP (training, Share of advances in technology, best practices, visits among NARS breeders, Phenotyping support, funding opportunity, WEB tools and instructions…) Full participation on research for development. Information on new technologies and benefits (MARS, Genomewide selection, QTL mapping, Association mapping, etc.)
- Specific conditions have been set up by GCP regarding the Intellectual property. GCP has established a specific Policy where collaborators have the obligation to unconditionally share the Challenge Programme IP.

Effective impact

Presently and given the GCP upstream nature, the effective impact is very tangible in accelerating the overall research chain, selecting valuable stress resistant traits, providing a wide range of stress-adapted germplasm, particularly drought resistant, improving the molecular breeding methodologies, reinforcing the researcher capacities through the communities of practice, enhancing the capacity in genotyping and phenotyping processes, and establishing a efficient breeding platform. But the mission also observed that many CGs and NARS have also been early involved downstream, involving pilot farmers in testing new varieties, and delivering seeds even when they are still in the pipeline for certification. Many CGs and NARS also foresee the importance of being involved more deeply at farm level to draw lessons on research applications and constraints for future developments. The following examples show that a) all selected research products are very prone to impact pro-poor and food security since they are focusing in priority on drought and disease resistance and mainly for Africa, b) target research are also prone to tackle food security bottlenecks in poorest regions, e.g. breeding Striga-resistant cowpea varieties in Africa being crossed into farmer-preferred varieties, or the rice salt-resistance programme in Bangladesh, c) the upstream effective impact encourages CGs and NARS to be more and more involved downstream at farm level, where they can test the final products and recover feed back from final users.

- The IRRI station[4] tested drought tolerant rice in India with implication of pilot farmers in the research process. The IRRI is keen to track the adoption of final products in association with NARS.
- INIFAP Mexico[5] has been involved in dry bean improvement and marker assisted selection for diseases and abiotic stresses in Central America and the Caribbean. Since its inception in 1980 in Mexico, the breeding project for adaptation to drought has been based on crop phenology, and seed yield in multilocational trials under water stress conditions. Many trials have been undertaken involving pilot farmers, which provide important feed back to INIFAP.
- The National Root Crops Research Institute NRCRI[6], based in Nigeria, but working also in Ghana, Uganda and Tanzania. NRCRI works on genetic improvement for drought tolerance cassava, cassava mosaic disease and cassava brown streak disease improvement, in Sub Saharan Africa. They have established a link with farmer organizations, working on participatory plant breeding with farmers, with demonstration of superior yields for accelerated adoption of new resistant varieties, dissemination of farmer's preferred

[4] From the interview of Arvind Kumar
[5] From the interview of Jorge A Acosta-Gallegos
[6] Emmanuel Okogbenin

varieties, and farmer driven dissemination of improved materials. Some varieties have already been released in a very short laps time : the quest for CMD-resistant cassava was in 2005, the variety testing in 2008–2010, and finally the variety (Dubbed UMUCASS33) was released in December 2010, this new variety brings together the best from South American and African cassava with higher yields (as much as 40% more) and tolerance to acid soils and CMD disease resistance. This is the first great example of a practical application of marker technology in cassava for the selection of important new traits, and In this regard the NRCRI considered that the release could not have taken place without the partnerships fostered through the GCP-funded cassava community of practice (CoP) that played an important role in the design of appropriate breeding scheme.

- IRD/CIAT Colombia[7] has developed applications of gene discovery in rice and recovery of wide range of "lost" alleles that are still present in the wild species. They were using Oriza sativa combining with Oriza glaberrima. They applied the QTLs for traits of interest and mapping major resistance gene to combine different traits such as rice stripe necrosis virus, yields and Striga resistance, and drought tolerance. They have also overcome sterility barrier when breeding Oriza sativa and Oriza glaberrima, that hampers full use of interspecific lines in breeding programs. Whilst they are not directly involving farmers, they are closely interacting with NARS in Burkina Faso, Mali, Benin, Colombia, and the Philippines.
- Embrapa Maize and Sorghum Brazil[8] has developed an aluminum tolerance gene in sorghum linking upstream genomics to downstream acid soil breeding in Niger and Mali. The main objective was the improvement of cereal on acid soils (Al tolerance and P efficiency) with result of a deeper root system. The project started in 2007 after mapping a major Al tolerance locus on sorghum, AltSB in 2004. The procedure was the low-cost SNP genotyping assay for Al tolerance, with higher potential grain yield advantage on acid soils. The strategy consisted in the technology transfer for evaluating and developing sorghum germplasm and cultivars with enhanced tolerance to Al toxicity to the sorghum producing regions of Niger and Mali. One of the main outputs was the incorporation of Al tolerance genes in the best multiple stress tolerant improved cultivars developed or under development at INRAN and ICRISAT Mali and the best landraces from Niger and Mali, and Exchange of sorghum germplasm between NARS (INRAN, ICRISAT Mali) and Embrapa. Two varieties were achieved in 2008 and 2009 and tested, from an initial adaptation of 174 sorghum entries. New management practices including rotation with cowpea. GCP has strengthened Embrapa to develop and use molecular breeding tools. However EMBRAPA considers that NARS and extension services are in still weak to disseminate research results and facilitate their uptake by farmers, especially the human resources capacity. There is a need for efficient "marketing tools" to demonstrate advantages to farmers, and they believe that they can help develop and transfer this technology to NARs in Africa, but with the support of CGIAR.
- IRRI[9] was also invloved in speeding the development of salt-tolerant rice varieties through marker-assisted selection and dissemination in salt-affected areas that are prevailing in Bangladesh. The research is also coordinated with World Fish which is also undertaking similar research on salt-tolerant Tilapia. The IRRI has made introgression of salt-tolerance QTL Saltol[10], into popular varieties, evaluated the introgression lines and assess the impact in farmers' fields in 2010. Therefore farmers have been highly implicated at different research stages, and the IRRI has been authorized by the ministry to deliver tested salt tolerant seeds to the poorest communities of North East Bangladesh before certification. The IRRI has also delivered capacity building of national research institutions in MABC Marker assisted Back crossing, organized visits of researchers form India, Bangladesh, Indonesia, and evaluates every season farmers' feedback on new released varieties.

[7] From the interview of Mathias Lorieux
[8] From the interview of Jurandir Vieira Magalhaes and Robert Schaffert
[9] From the interview of Abdelbagi M. Ismail
[10] Three varieties completed, BRRI dhan28, BR11& IR64

3.1.3. Adequacy of the Research and Dissemination strategies

- The dissemination of highly performing technologies Marker Assisted Breeding MAB (MABC, MAS, MARS, GWS). MAB fasten the breeding process, particularly valuable for traits that are difficult or expensive or time-consuming to evaluate. The impact ex-ante study[11] show significant monetary benefits of using MAB, e.g. for rice incremental NPV from USD million 50 to 500 over 20 years, and development time savings 3 to 6 years as compared to Phenotyping Selection. Moreover this study assesses the probability of success on the basis of partners, infrastructures, commitment to project and progress of projects, and preliminary conclusions are that assumptions in economic surplus especially for sorghum and rice in Africa with some 20% to 30% ion yield surpluses and less for wheat in India and China where research chances of success are quite high.
- GCP has set up adequate devices to accelerate the technology dissemination process, through the Integrated Breeding Platform (IBP) that provides developing countries access to modern breeding technologies and wide range of information that were not accessible in the past, and contributes to fasten decision process and germplasm delivery. The other appropriate device is the implementation of COPs that facilitate experience and tools sharing; stakeholders consider that COPs members have been more efficient to solve problems. The third aspect is the specific Policy for Intellectual Property that facilitates the use of the Challenge Programme outputs.
- The dissemination of certified seeds to poor farmers, as result of GCP activities, is estimated to take place within two or three years. Moreover the GCP mandate does not include the dissemination strategy at farm level. However following the brain storming exchange with the GCP team and the high interest for CGs and NARS for more traceability, there is an alternative to track the final research products at CG level and monitor the delivery to final users at the level of the breeding platform. This proposal has been welcome, but the procedures need further assessments at GCP level.

3.1.4. Operational efficiency in transforming research into development impact

The GCP has been very efficient to support partners, making high technologies available in developing countries' environment. It provided wide impact of new genes, markers and traits, and facilitated an effective uptake of molecular breeding through well established research-development links and capacity building of stakeholders. The majority of interviewed scientists did recognize that the GCO support was efficient and they could not achieve their research programme without the assistance of GCP. Many of them stated that GCP contributed to significantly speed up the overall research programme. The only critical point was the complexity of some data management tools, for which GCP seems to be already aware.

3.1.5. Effectiveness in achieving foreseen project outputs

The project has been very effective in achieving the foreseen project outputs and very creative to innovate in all kind of tools, COP and IBP, that facilitates the communication between the different stakeholders. The project has been gradually evolved from the initial stages, crop genetic diversity, genomics and gene discovery, with not less than 28 projects, to trait capture for crop improvement, crop information systems and now is more and more involved in capacity-building and delivery processes. Therefore the GCP mandate is clearly achieved so far, and the dialogue is now open for the transition period before integrating the research at CGIAR level; the viability of Integrated Breeding Platform will be the most challenging issue since there are high differential for potential stakeholders' contributions to the IBP.

With regards to the foreseen project outputs GCO focuses more on horizontal programmes since 2009 with particular interest for the molecular breeding services to ensure the viability of the Platform:

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[11] George W. Norton , Virginia Tech University, USA 2010 2011

Output 1. The breeding platform has been set up and contributes to capacity building, and enables broad access to crop resources, advanced technologies and research databases, including online source of information.

Output 2. The research and learning opportunities for GCP collaborators and NARS scientists consisted in grant programmes and started in 2007. This includes different supports in particular "à la carte "capacity-building for researchers and technicians.

Output 3. The construction of systems for ensuring product delivery, GCP has set up an online version of a Delivery Plan Kit, but also supports COP such the cassava breeding COP in Africa for accelerated dissemination of farmer-preferred cassava varieties resistant to pests and diseases.

Output 4. The implementation of support services included the Molecular Breeding Platform that was launched in 2009, the Interactive Resource Center with toolbox of available molecular markers, and the Genotyping Support Service.

Output 5. The ex ante impact analysis and impact assessment: GCP has created WEB databases for target and impact analysis of technologies, and launched ex-ante impact analysis of MAS technologies, food crops and smallholder constraints, as well as an ex-ante GCP impact analysis in 2010.

3.1.6. Sustainability of operational efforts and use of research products

The GCP has set up broad network working in international and national agricultural research programmes, with not less than 200 partners, and has been involved in research and service components that are very complementary. GCP is committed to close by the end of 2013 and has established a MTP for a sustainable integration of GCP activities, given the ongoing CGIAR reform and the formation of the Megaprogrammes (MPs). GCP Consortium members proposed a transition strategy in which the key element is the reformulation of the IBP into an Integrated Breeding Service (GIB Service), incorporating services for genomic research, that aims to provide access to a wide set of tools, including technologies resources and support services for genomics research and integrated breeding activities. The rationale is also to expand the IBP to broader range of users and attract enough new users to make it sustainable.

The full impact of GCP products will require keeping the research and service components that contribute to high level of efficiency and pursue the overall process to ensure an appropriate downstream ownership. Moreover the capacity-building component is crucial to ensure that developing country partners are to use modern breeding tools, can conduct field experiments, and appropriately monitor or track the delivery process in a sustainable manner in particular with the assistance of COPs. That is why the mission supports the concept of such platform.

The platform must be sustainable beyond GCP and be accessible to CGs and NARS, but also down-stream, for breeding programs and seed distribution networks. One of the challenging issues is attract sufficient number of partners to ensure the viability of the platform; this may be achieved by stimulating the interest of new users through active molecular breeding COPs, or professional networks. The financial needs are estimated to USD10 million per year, given the annual committed income of USD 5 million from the Bill & Melinda Gates Foundation. However GCP partners must resolve the contribution mechanism which has to meet the financial capacity of the different stakeholders. GCP has drawn a first financial projection with the largest portion of the budget goes to developing-country programmes, and includes significant amounts for capacity building that is inbuilt in the research activities. A buffer financing mechanism is recommendable since it may provide flexibility during the transition phase.

The governance framework of this platform which is supposed to be operational after 2013 is in the pipeline for discussion with partners. One of the most probable alternatives is to set up a Trust Fund governed by a committee based on the model of the existing Consortium Committee

(CC) with the seven Executive Board members, with full authority to oversee the management, approve budget and strategies and monitor the achievements.

Some critical risks are related to the COPs which could contribute to drive the development and operation of the GIB Service from a user perspective, and also ensure its sustainability; but many COPs, particularly in Africa, have also to seek financial resources to maintain their activities.

3.1.7. Added Value and Coherence

GCP is globally coherent with the EU food security agenda that provide support for effective demand-led agricultural research for development and innovation, with research in the public domain relying on both traditional knowledge and new technologies. Moreover *the EU recognizes the importance of investing in international public goods, in particular in pro-poor, demand-driven research and technological innovation as well as capacity development and South-South and South-North scientific and technical cooperation.* CGIAR is the main partner in the field of agricultural research and is involved in South-South and South-North cooperation. GCP has developed agricultural research for marginal environments and poor farmers. Operating at international level, GCP contributes to the goals of national and regional development strategies in partner countries by adding value to local efforts to improve agriculture, through sharing best practices with different countries.

Due to climate change, drought is undisputedly one of the biggest threats facing agriculture today, with devastating effects on entire landscapes and regions, and predictions is that sub-Saharan Africa is likely to suffer most from the combined effects of higher temperature and reduced rainfall, which imply a higher frequency of drought conditions. GCP has been challenging in this environment focusing mainly on drought resistance and major diseases, and providing added value to combat food insecurity and poverty.

The agricultural research agenda of GCP also takes advantage of new technologies and innovation to enhance the agricultural knowledge in developing countries with innovative solutions and address food security

3.1.8. EU visibility

The visibility cannot be expected given the number of donors; but the financial contributions are transparent.

3.1.9. Conclusions

GCP is a working with a broad network with very ambitious goals and has established a wide range of research tools that have been particularly appreciated by all stakeholders. Since the very start and by mandate was GCP is upstream oriented and the delivery objective of SP5 basically targets the scientific network. However GCP is gradually evolving to this last component and is prone to enter into a more downstream approach, following the logical research–delivery pathway. In spite of its characteristics, GCP has generated innovative initiatives giving the opportunity to CGs and NARS to be more and more involved at farm level. In some cases seeds with new alleles have already been disseminated, e.g. cassava CMD disease resistant in Nigeria, salt-tolerant rice non certified varieties in Bangladesh, or two certified varieties of drought resistant maize in Kenya. Most of GCP partners are interested to track the final products as potential feedback from the research process; that is why many CGs and NARS are involving pilot farmers to test the products at the final stage. As result the GCP, which has been highly performing upstream, should take the opportunity to evolve to a more downstream approach during the transition phase.

4. Lessons Learned

High standard research technologies can be adapted for developing countries and interactive platforms play an important role as demonstrated by GCP. It contributes to tackle challenging issues related to climate changes particularly in Sub-Saharan Africa and contribute to pro-poor development and food security. The new challenge for researchers is more and more the phenotyping assessment since the genotyping has been significantly made accessible and comprehensive to users. This leads more and more to a crucial need for capacity building in which GCP has been deeply involved. This also leads to involve farmers in the research validation, simply because the validation is an important phase where final research outputs must be tested in real and different situation. That is probably why many CG scientists are involved in the overall process and closely interact with farmers. The most valuable achievement of GCP has been to initiate new linkages, collective actions and synergies between ARIs, CGs and NARS, for which all stakeholders recognized that these interactions leaded to very positive self commitments.

5. Recommendations

A cross-cutting comparison of molecular breeding efficiency for different crops, working with different kinds of partners, has been an important output of GCP. A similar procedure should be made when products are released at farm level, under different crop systems and environments; this will help research centers to validate the research outputs. That is why the mission recommends establishing a monitoring system, by tracking the certified products that would provide a global impact of the research.

GCP or the platform could play an important role in coordinating and harmonizing such information process. Lead Centers have to be established to coordinate the management of data collection crop information and database consolidation. CGs could play the role of leaders, since they have the ability to manage regional information. Indicators should be simple and include the number of improved crop varieties released as compared to number of lines with new alleles distributed by Centers through platform, the number of farmers, acreage and yield increases under improved crop varieties.

Such tracking device, hat may be integrated in the platform, should be discussed between the GCP partners before the transition phase.

6. Annexes

Annex 1. List of interviewees

Mexico				
Category	**Name**	**Organisation & Function**	**Contacts**	**Date**
EUD				
GCP Staff	Jean-Marcel Ribaut	Director / GCP	j.ribaut@cgiar.org	
	Ndeye Ndack Diop	Leader: Theme4: Capacitiy Building /GCP	NN.Diop@cgiar.org	
	Fred Okono	IBP Consultant/GCP	f.okono@cgiar.org	
	Larry Butler	Leader: Theme 5: Product Delivery /GCP	l.butler@cgiar.org	
	Graham McLaren	Leader: Theme 3: Crop Information Systems/GCP	g.mclaren@cgiar.org	
	Chunlin He	Breeding Services Manager IBP/GCP, Mexico	C.He@cgiar.org	
Research Generators	Tom Payne	Head of International Nurseries /CIMMYT, Mexico	t.payne@cgiar.org	
	Arvind Kumar	Senior Scientist, Plant Breeding, Genetics and Biotechnology /IRRI, Philippines	A.Kumar@cgiar.org	Video Conference
	Xavier Delannay	Leader: Theme 1: Comparative & Applied Genomics/GCP	x.delannay@cgiar.org	Video Conference
	Jorge A Acosta Gallegos	INIFAP, Mexico	jamk@prodigy.net.mx acosta.jorge@inifap.gob.mx	Video Conference
	Emmanuel Okogbenin	NRCRI, Nigeria	E.Okogbenin@cgiar.org eokogbenin@yahoo.com	Video Conference
	Mathias Lorieux	Geneticist/CIAT, Colombia	M.Lorieux@cgiar.org	Video Conference
	Jeff Ehlers	Research Specialist/UCR, Inited States	jeff.ehlers@ucr.edu	Video Conference
	Abdelbagi M Ismai	Plant Physiologist/IRRI, Philippines	abdelbagi.ismail@cgiar.org	Video Conference
	Jurandir Vieira Magalhaes	EMBRAPA, Brazil	jurandir@cnpms.embrapa.br	Video Conference
	Robert Schaffert	EMBRAPA, Brazil	schaffer@cnpms.embrap	Video

			a.br reschaffert@hotmail.com	Conference
Research Users				
Enabling Environment				

Annex 2. Travel schedule

Day	Visits and meetings
13 February 2011	Travel to Mexico
14 February 2011	08:30 Visit to EC representation in Mexico city 11:00 Travel to CIMMYT 14:00-16:00 Introduction to the GCP (J-M Ribaut) 17:30-18:30 Communities of Practices COP (Ndeye Ndack Diop, Fred Okono)
15 February 2011	08:00-09:00 Capacity building activities (J-M Ribaut, Ndeye Ndack Diop) 09:00-10:30 Introduction to molecular breeding activities, phone conference ABC seminar room) (Xavier Delannay, Monsanto, St Louis) 11:00-12:30 Product and delivery plans (Larry Butler) 14:00-15:30 The Integrated Breeding Platform and presentation of the Integrated Field book (Graham McLaren) 15:30-16:30 The IBP delivery plan (Larry Butler) 16:45 17:15 Visit the gene bank and introduction to the wheat reference , Tom Payne (Gene Bank) TBG 17:30-19:00 Detecting and fine-mapping QTLs with major effects on rice yield under drought stress for deployment via marker-aided breeding (Arvind Kumar, video conference Philippines IRRI)
16 February 2011	Trip to Celaya: Jorge A Acosta-Gallegos, INIFAP Arrival at 10:00 Update on the project: Dry bean improvement and marker assisted selection for diseases and abiotic stresses in Central American and the Caribbean Visit to the greenhouses Interaction with farmers working with INIFAB Departure around 15:00
17 February 2011	8:30-10:00 Cassava improvement for drought prone environment in SS Africa, phone conference (Emmanuel Okogbenin, NRCRI, Nigeria)

	10:30-12:00 New genetic resources to give full access to the African rice allele pool for enhancing drought tolerance in SS Africa, video conference (Mathias Lorieux, IRD, Colombia) 14:00-15:00 Molecular marker service laboratories and Genotyping Support Services (Chunlin He) 15:00-16:30 Improving drought tolerance in cowpea for SS Africa video conference (Jeff Ehlers, California River side) 16:45-17:30 Brain Storming on phase III & product tracking 18:00-19:30 Speeding the development of salt-tolerant rice varieties through marker-assisted selection and their dissemination in salt-affected areas of Bangladesh, video conference (Abdelbagi M Ismail, IRRI Philippines)
18 February 2011	08:30-09:30 Impact assessment and Ex ante analysis (Larry Butler) 09:30-10:00 IP and public goods (Fred Okono) 10:00-10:30 GCP Workflow system (Fred Okono) 11:00-12:30 Tailoring superior alleles for abiotic stress genes for deployment into breeding programmes: a case study based on association analysis of AltSB, a major aluminium tolerance gene in sorghum, video conference from Brasil (Jurandir Vieira Magalhaes, EMBRAPA) Assessment of the breeding value of superior haplotypes for AltSB, a major Al tolerance gene in sorghum: linking upstream genomics to acid soil breeding in Niger and Mali video conference from Brazil (ALTFIELD) (Robert Schaffert, EMBRAPA) 14:00-15:00 Project Management (Jean-Marcel Ribaut) 15:00-16:00 Wrap-up session (Jean-Marcel Ribaut) 17:00 17:30 Kenya Delivery process maize (James Gethi) KARI supported by GCP since 2004 (GSS Genotyping Support Services)
19 February 2011	09:30 Departure to Mexico
20 February 2011	23:50 Departure to Europe
21 February 2011	Travel to Europe

Annex 3. Abbreviations and Acronyms

BRRI	Bangladesh Rice Research Institute
CG	Consultative Group
CGIAR	Consultative Group on International Agricultural Research
CIAT	Centro Internacional de Agricultura Tropical (International Center for Tropical Agriculture)
CIP	Centro Internacional de la Papa (International Potato Center)
CRP	Commodity Research Programme (of the CGIAR)
CP	Challenge Programme
CIMMYT	Centro Internacional de Mejoramiento de Maíz y Trigo
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement (Agricultural Research for Developing Countries)
COP	Community of Practice
CRURRS	Central Rainfed Upland Rice Research Station, India
DAC	Development Assistance Committee
DG	Director General
EIARD	European Initiative for Agricultural Research for Development
EC	European Commission
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuária (Brazilian Enterprise for Agricultural Research)
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GIBS	Genomics and Integrated Breeding Service
GCP	Generation Challenge Programme
GIS	Geographical Information System
GTZ	German Agency for Technical Cooperation
GWS	Genome Wide Scan
IARI	Indian Agricultural Research Institute
IBP	Integrated Breeding Platform
ICARDA	International Center for Agricultural Research in the Dry Areas
ICRISAT	International Crop Research Institute for Semi-Arid Tropics
IER	Institut d'économie rurale, Mali
IFAD	International Fund for Agricultural Development
IGD	Integrated Genomic Database
IGD-CU	Institute for Genomic Diversity, Cornell University, USA
IITA	International Institute for Tropical Agriculture
INIA	Instituto du Investigacao Agraria (National Institute of Agricultural Research)
INIFAP	Instituto Nacional de Investigaciones Forestales y Agropecuarias (National Institute for Investigation in Forestry, Agriculture and Animal Production) (Mexico)
INRA	Institut National de la Recherche Agronomique (National Institute for Agricultural Research)

INRAN	Institut National de la Recherche Agronomique du Niger (National Institute for Agricultural Research in Niger)
IP	Intellectual Property
IRD	Institut de Recherche pour le Développement (Institute for Research and Development)
IRRI	International Rice Research Institute
ISRA	Institut sénégalais de recherches agricoles, Senegal
KARI	Kenya Agricultural Research Institute
MABC	Marker-assisted backcrossing
MAS	Marker-Assisted Breeding, Simple traits: Marker-assisted Selection
MARS	Marker-assisted recurrent selection (Pyramiding of genes)
MDGs	Millennium Development Goals
MTP	Medium Term Plan
NARI	National Agricultural Research Institute
NGOs	Non-Governmental Organizations
QTLs	Quantitative Trait Loci (Inheritance and mapping)
R&D	Research and Development
WB	World Bank