IV. White papers on GCP communications and knowledge sharing:

Paper No 9: GCP's institutional memory
(publications, information and websites)

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Acronyms and abbreviations

avg	average
CD	compact disc
CGIAR	No longer an acronym but a name (*formerly* Consultative Group on International Agricultural Research)
CP	CGIAR Challenge Program
CRPs	CGIAR Research Programs
DPKit	Delivery Plan Kit
DVD	digital versatile disc
EB	(GCP) Executive Board
FAO	Food and Agriculture Organization of the United Nations
G&D	CGIAR Gender & Diversity Program (*now defunct*)
GCP	Generation Challenge Programme
GRM	General Research Meeting (of GCP)
IBP	Integrated Breeding Platform (of GCP)
ICT–KM	CGIAR Information and Communications Technology and Knowledge Management Program

Background and process

A series of Position Papers have been drafted by the CGIAR Generation Challenge Programme (GCP) team in collaboration with external experts. The goals are to communicate the outputs and deliverables from each research component during 2004–2014, and to explore options for enabling and ensuring that the potential benefits of these components will be fully realised in the future.

The Position Papers are not static but dynamic in nature: they are expected to evolve over time,[2] shaped by progress made during GCP's remaining time, and by the evolution of international agricultural research for development. This will be particularly so in terms of the 'moving landscape' of socioeconomic, political and environmental issues in which the CGIAR operates.

Each Position Paper is designed to contribute to GCP's orderly closure in 2014, by considering the following questions:
1. What research assets will be completed by the end of GCP's lifetime in December 2014?
2. What research assets can best continue as integral components of the new CRPs or elsewhere?
3. What research assets may not fit within existing institutions or programmes and may require alternative implementation mechanisms?

This paper focuses on the outputs and options for GCP's institutional memory component, including publications, information and websites. Outputs have been achieved through (a) collaborative work among three sets of actors: a broad network of partners in regional and country research programmes, the CGIAR and academia; and (b) through capacity enhancement to assist developing-world researchers to tap into new genetic diversity and access modern breeding tools and services. GCP research activities have produced the research products described in the sections that follow[3].

Introduction and rationale

GCP's work in Phase 1 (2004–2008) can be characterised as exploration and discovery. Research activities focused on identifying the most promising research interventions and ideal partnerships to deliver significant products that will improve genetic research and crop breeding. For the current Phase II (2009–2014), the focus is now on applying genomic tools in selected developing-country breeding programmes to demonstrate that molecular breeding can increase genetic gains when improving germplasm for adaptation to target environments in developing countries. To achieve this objective, GCP is leading the development of an Integrated Breeding Platform (IBP) which aims to provide developing countries with access to modern breeding technologies, breeding materials and related information in a centralised and practical manner. Thus, IBP facilitates their adoption of molecular breeding approaches to improve their plant breeding efficiency.

As an upstream science programme, one of GCP's prime products is knowledge. The GCP network and partnerships bring together a diverse array of applied research teams and scientists from developing and developed countries, CGIAR Centres and universities. Their work has led to the accumulation of a large stock of knowledge that will remain valuable after the Programme closes in

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[2] This GCP Position Paper, like the others in this series, is not a conclusive static document. Instead, it will continue to grow and evolve as the processes of evaluation and deliberations advance toward GCP's end in 2014.

[3] GCP is supported by an array of funders. See also descriptions of products and of the institutions that produced them.

2014. For example, IBP can be used by breeders to help organise their projects and analyse their data; the publications are very important to those that cannot afford journal subscriptions, while the learning modules are useful both to practitioners as well as in the classroom or training courses. All this knowledge, however, only becomes useful if it is accessed, well documented and applied. The goal would then be three-pronged: i) to work out how to make the knowledge that GCP has produced and accumulated accessible; ii) how to keep it suitably relevant and up to date: and, iii) how to increase and broaden awareness of these products.

Product outputs and activities

Overview

- *The GCP [website](#)*: In the eight years that the Programme has existed, it has generated and accumulated a significant amount of knowledge in the broad sense, ranging from blogs to experimental protocols. This knowledge is stored at its website, which acts as GCP's main window for communications, information and knowledge sharing with the world. The website was revamped in mid-2012 in a bid to align it with the Programme's evolving structure, place more focus on research, make it more impact- and product-oriented than Phase I, and also make it more intuitive and user friendly. Refinements are still being made. The revamp also included a GCP blog (supported by other social media tools) that aimed not only to inform but also to drive more traffic to the website's core content (see Annex for preliminary post-revamp statistics on web traffic).
- *The IBP [website](#)* is the 'shop window' of the Integrated Breeding Platform (IBP). The Platform aims to be a 'one-stop shop' for the information, analytical tools and related services needed to design and conduct integrated breeding projects. It is conceived as a vehicle for disseminating: (a) knowledge and technology, thus enabling broad access to, and proactive distribution of, crop genetic stocks and breeding materials; (b) molecular, genomics and informatics technology and information; (c) cost-effective high-throughput laboratory services; and (d) capacity-building programmes. Its primary clients are developing-country breeders. So far, 486 members have registered on the IBP Portal.
- *Social media:* The 'top-tier' social media accounts [Facebook](#) and [Twitter](#) went live in mid-February 2012 (and [LinkedIn](#) later in October), while the [blog](#) and the 'second-tier' social media accounts ([Flickr](#), [Delicious](#), [PodOmatic](#), [YouTube](#) and [SlideShare](#)) were activated in mid-2012 at the same time as the new website was launched. Initially, the GCP and IBP websites shared the same accounts, with traffic from these sites channelled to either website. In August 2012, IBP opened its own [Facebook](#) and [Twitter](#) accounts, but for now, continues to share the same blog and the 'second-tier' social media with GCP. The blog is a crucial intermediate layer (in both tone and content) between the micro-blogging social media and the static core content on the GCP and IBP websites. Using Facebook as the indicator, the demographics of those who 'like' us show that the people being reached are in their prime professional productive age (ie, in the 25–54 age group). For further comparative statistics, see the Annex in the white paper on GCP's scientific and social networks.

The revamped GCP website is still in the soft-launch phase. The official launch will take place once key refinements are made and more content has been migrated to the new site. The new website has been announced via Facebook and Twitter, but with the qualifier that it is still a 'work in progress'. The IBP Portal is also still in soft launch. It is therefore not yet possible to meaningfully gauge the significance of the number of visitors it is currently receiving.

The knowledge products that the Programme has generated and accumulated over time fall into the following categories:

GCP website

- The GCP [Product Catalogue](#) provides information on other products from GCP-funded projects such as genetic and genomic resources, with details on how to access the products. [Variety releases and product updates](#) records new product and crop variety releases. Details on these products are provided in the white papers on GCP's research elements.
- [Programme publications](#): These include [Annual reports & workplans](#); [Medium-Term Plans](#); [Brochures](#) on various aspects of GCP's work; [Impact briefs](#), which highlight the impact of GCP products; [Project updates](#) that catalogue progress in ongoing projects at various points in time; [Project briefs](#), which describe the projects the Programme is undertaking; [Programme-level posters](#) and [Project-level posters](#); and [Highlights](#) of specific aspects of GCP.
- [Research publications](#): These include [Books](#), [Book chapters](#), [Journals](#), [Journal articles](#) and [Academic theses & dissertations](#).
- [Conference & workshop papers](#); and [Conference & workshop proceedings](#).
- [Working & discussion papers](#).
- [Media](#) products: These include numerous [Feature stories](#); [News & updates](#) on key milestones in the Programme's work, often accumulated in the eNewsletter [GCP News](#); various [Press releases](#); press clippings of [GCP in the media](#); and an [Events](#) diary.
- [Project management](#) and policies:
  - *GCP Workflow Management System*: This custom-built information and project management system incorporates various workflows, document repositories, and project monitoring & evaluation mechanisms. It preserves project proposals, and project technical and financial reports, and facilitates first-instance identification of project outputs and products. The [Integrated Breeding Platform Project Wiki](#) serves the same purpose, but specifically for the Integrated Breeding Platform project.
  - *Delivery Plan Kit (DPKit)*: This tool is used to develop and monitor research product delivery plans, which are required for all GCP projects in Phase II.
  - [Policies](#) cover management at both project and Programme levels, including aspects such as intellectual property, global access, subsistence use, data availability, publications and transgenics.

IBP website

- [Learning materials](#): GCP has produced a set of learning materials on plant science that has proved very popular. The set covers a variety of areas, including genomics and comparative genomics, marker-assisted breeding, drought phenotyping, data and information management, data analysis, and intellectual property & policy issues. Details on these are provided in the white paper on capacity building.
- *Molecular Marker Toolkit*: GCP uses this tool to share knowledge on molecular markers available for various crops to ensure that crop breeders are kept informed of resources available in the public domain.
- [Crop information](#) and [Breeding services information](#): These sections are covered in detail in four of the annexes to the white paper on IBP: *Annex 1 – Breeding information and communities of practice, Annex 2 – Data management software, Annex 4 – Data management service* and *Annex 5 – Breeding and support services*.

These knowledge products are either developed by GCP itself at Programme level, or from GCP-funded projects implemented by subcontracted institutes, with a full listing provided. Where no copyright or IP prohibitions exist, the knowledge products are downloadable directly from the GCP and IBP websites. For copyright-protected materials, an onward link is provided either to the abstract in the case publications, or to the copyright holder. Offline electronic media (CDs, DVDs, flash disks) are also used to disseminate knowledge products.

The development, sharing and dissemination of GCP's knowledge products have helped found a 'GCP community', comprising of a network of collaborators distributed in the CGIAR Centres and CRPs, crop research institutes in both developed and developing countries, and numerous universities.

So far, GCP's primary target for communication and information has largely been its own community, focusing on researchers working on GCP projects. However, and primarily through the IBP portal and other social media efforts, GCP is progressively reaching out to audiences beyond its own projects and IBP user cases.

Reviews and evaluations

As part of its corporate culture of transparency in information sharing, GCP's internal and external evaluations are posted on the public website, readily accessible to all.

In sharing this information, GCP's aspiration is to ensure that the lessons drawn from the Programme's own experience, including mistakes made, are available to those who would find this information useful in effectively reshaping and reorienting their own programmes or initiatives. Or, by knowing the 'dos and don'ts' well in advance, they could benefit from these lessons on conceptualising a programme or initiative.

Together with the other CGIAR Challenge Programmes, GCP participated in the drafting of a 2009 joint paper. This paper set out the lessons learnt from the CP experience that would be relevant for formulating the CRPs (then termed 'Mega-programs').

When GCP closes, a summative and final evaluation will be conducted, primarily to assess the Programme's progress in achieving the objectives it was created to meet. This evaluation may well yield additional lessons learnt.

Post-GCP sustainability and projected impact

Information and knowledge sharing

The overall goal of information and knowledge sharing is to ensure a good flow of information from those who have it to those who need it, thus providing opportunities for GCP's partners to improve work efficiency and thereby increase crop productivity to enhance food security. GCP is committed to ensuring that its knowledge products are well documented, relevant and up-to-date, user-friendly, and easily searchable.

Although these products are mostly accessible to all, free of charge, payment may need to be considered, depending on the product and for ensuring sustainability. For example, online information can be provided free of charge, but where printed or CD versions are required, then the client would pay for the production and mailing costs. Another example is to provide the first version free of charge, but subsequent updates (or specific adaptations for particular circumstances) at cost to the client. Precedents of such arrangements occur in the public sector, including within the CGIAR. The now defunct CGIAR G&D Program offered a suite of at-cost services, for which there was demand, with some even being oversubscribed.

Curation and updates

The curation and updating of information can be achieved through active specialist communities. Interacting mostly through online media, these communities would undertake to add to, curate and disseminate the body of knowledge in their particular area of expertise. They would also help sustain

the sense of community that GCP projects have brought about between researchers working in different countries, institutes and fields.

These communities are discussed in more detail in the white papers on scientific and social networks and on the IBP.

Access

Online: Most of these knowledge products are available in electronic form, the bulk being accessible through the GCP and IBP websites. The websites and the overall online environment are therefore key to sustainably meeting this dissemination and accessibility goal. As such, sustainability per se may not be a major issue, although accessibility after December 2014 is a matter that will require further attention.

Offline 'static' electronic media such as CDs and DVDs are equally important for sharing and dissemination, particularly where connectivity or bandwidth are a problem, or for targeting and convenience.

Cost implications: Curating and updating online content, and production and dissemination using offline media all have cost implications, as was discussed in this section's opening paragraphs.

Success and impact

The impact of GCP's knowledge products is potentially highly significant, assuming it is appropriately packaged and placed for optimal access by the target audiences. This is particularly important for developing-country breeders whose access to such products is generally limited because of a variety of factors.

On a relative scale of 1 to 5, where 5 represents the largest impact across all kinds of GCP products, regardless of activity or crop, and 0 no impact, GCP's collective efforts in information and knowledge sharing are estimated to have an impact factor of 4. Such a high score indicates that this activity is a 'must-have' to sustainably promote access and use of modern breeding in developing countries.

From the summative evaluation scheduled for when the Programme winds up, the evaluation itself and the lessons learnt from this process are likely to be relevant and instructive for the new and emerging CRPs, and for other networks in research and development. This evaluation would also yield concrete figures and metrics on success and impact.

Analysing the post-GCP placement of knowledge products

What will have been completed by December 2014

Information and knowledge products on the Programme's operational aspects will naturally terminate with its closure in 2014, having served their purpose. They would thereafter only need to be retained for historical or archival purposes. Given its centrality, the Consortium Office is an ideal storage for these products. It would reflect the relationship that GCP has had with the CGIAR Centres and, more recently, the CRPs. Discussions with the Consortium Office have already begun.

The GCP Workflow Management System, DPKit and Policies contain useful historical or fairly general information, which, theoretically, could be adapted and developed further for use by other entities. These tools and the information they carry could also be archived.

The blog and social media accounts associated with the GCP and IBP websites (if IBP should also fold up) would cease to be active at the Programme's closure. Subscribers would be advised accordingly and given recommendations on new accounts as applicable and as appropriate, whether within the CRPs, Consortium Office, or elsewhere outside the CGIAR. To prevent new subscribers from signing up for these defunct accounts, a notification to this effect would be posted in each respective account and blog.

Products that are more historical in nature (eg, past issues of *GCP News*, brochures, annual reports, project updates and project reports) could potentially be archived at the Consortium Office. In much the same way as is being done for former System Office Units (eg, ICT–KM and [Gender & Diversity Program](#)), the archiving could be done in the form of a 'petrified' GCP website that would still provide convenient and searchable access to the materials. The way the ICT–KM website will be handled is expected to be particularly instructive for GCP's case.

Extending activities to CRPs, Centres or other institutes

Crop-related knowledge products that are likely to be of continued utility could ostensibly be placed in the respective CRPs or crop lead Centres. Updates on these would then be done in these new 'homes' as part of their ongoing operations, thus assuring both sustainability and access.

Given its nature and intention, the IBP Portal is a natural home for dynamic products such as Learning Materials, Product Catalogue, Crop Information, Breeding Services Information and the Molecular Marker Toolkit. Such products have already been (or will shortly be) transferred to the Portal from the GCP Website. Their post-GCP placement would therefore be determined by the placement of the Platform, as discussed in the IBP white paper and its annexes.

Non-CGIAR potential homes for crop knowledge products would include relevant funding, research and development agencies, such as FAO and the Global Crop Diversity Trust. The location need not be exclusive, that is, the same crop knowledge product may appear on multiple sites within or outside the CGIAR.

Embedding the work in a new entity

Alternatively, GCP's knowledge products could be embedded in a new entity. Such an entity would archive and safeguard the products that are of a historical nature, and further develop and disseminate those that are of continuing utility. Thus, it would both add to the stock of information and also broaden the audience that the information reaches.

This option would be best exercised in the context of an autonomous or semi-autonomous IBP, that is, where the Platform is maintained post-GCP as a single integrated entity. This would be advantageous in that it would retain the current set-up where all the knowledge products are kept under a single entity, thus allowing for their coherent management.

Conclusion

GCP's knowledge products have been well received by target audiences – a testimony to their value and utility. The knowledge products resulting from the Programme's core activities (research, capacity building and service provision) will be of value, even after the Programme closes. These products should therefore be placed in such a way that they continue to be accessible and usable by target groups.

Although these products can be disaggregated and positioned in various entities within the reformed CGIAR, they would be better kept together with the IBP, especially if the Platform is

retained as a single integrated unit. The products would then be efficaciously disseminated, together with the Platform's tools and services.

Products of a historical nature can also be arranged in a similar way but, as they are static historical records, they can be sited elsewhere – preferably in a way that would still enable convenient online access and searchability.

Annex: Analysing GCP website traffic

Since GCP's venture into social media and the revamping of its website, web traffic showed a noticeable upsurge, with visitors engaging longer with the website. Statistics for 2011 and 2012 were compared, with the 2012 sector representing the period immediately following the opening of the new website. No General Research Meeting (GRM) was held in September 2012, an event that usually increases web traffic. Yet, statistics for July–August 2011 show 2,808 visits (a 'GRM' year), whereas those for 2012 (a non-GRM year) show 3,852 visits – a jump of about 37%!

The GCP website received an expert assessment in February 2012. It showed that the average visit lasted 4–5 minutes. Given that, for most websites, a visit usually takes 1–2 minutes, this was a very high rating. It indicated that GCP content gets read. Visits for July–August 2012 averaged 5:46 minutes, compared with 1:09 for the same period in 2011. The new-look website, together with sustained engagement in social media, therefore appears to be a winning combination for 'conquering' the annual 'summer slump' when most people in temperate countries are on holidays. A deeper analysis shows that an average visit from referral traffic (ie, visitors referred from other websites, including social media) lasted nearly 10 minutes (9:26).

But an even more interesting statistic for GCP is the percentage of returning versus new visitors, which was, respectively, 42% versus 58% for July–August 2012, compared with 13% versus 87% for July–August 2011. Higher premium is placed on returning visitors than on new visitors because the former are those who have found web content to be relevant and valuable. The growing percentage of returning visitors in recent months, the increasing number of pages they visit, and the smaller bounce rate are all therefore firm indicators of the growing value and renown of GCP's knowledge products and website content. Figures in the table below support this conclusion.

Table 1. Comparative statistics on visitors to the GCP website in July–August 2011 and 2012

Northern summer period							Indicator[a]	
	Visits (no.)	Unique visitors (no.)	Page views (no.)	Pages per visit	Avg visit duration (minutes)	Bounce rate (%)	Visitors (%)	
							New	Returning
2011	2,808	2,557	4,953	1.70	1:09	73.11	87	13
2012	3,852	2,314	17,911	4.65	5:46	27.8	58	42

a. Key to terms used for 'Indicators' in table above:
  Visits: the number of visits made to the site
  Unique visitors: the number of unduplicated (ie, counted only once) visitors to the website
  Page views: the total number of pages viewed: repeat views are included
  Pages per visit: the average number of pages viewed during a visit to the website. Includes repeat views. Also referred to as the 'average page depth'
  Avg visit duration: the average duration of a session, measured in minutes
  Bounce rate: percentage of single-page visits (ie, visits where the person left the website after viewing only one page). Generally, the lower it is, the better!
  New visitors: percentage of visits that were first-time visitors (ie, from people who had never visited the website before)
  Returning visitors: those who visited the website more than once during the period under review
SOURCE: Google Analytics