

Building on an earlier exploratory study, in 2007–2008 the CGIAR's Standing Panel on Impact Assessment (SPIA) undertook an initiative in collaboration with seven CGIAR centers to augment the evidence of policy-oriented research (POR) impacts within the CGIAR system and to further the development of methodologies in this challenging area of impact assessment. Seven case studies were commissioned. This impact brief describes the major results that emerged from Bioversity International. The summary version of the full case study report can be found in: Gotor, E., Caracciolo, F., and Watts, J. 2008. The impact of the In-Trust Agreements on CGIAR germplasm exchange and the role of Bioversity International in establishing the agreements. In: CGIAR Science Council. 2008. *Impact Assessment of Policy-Oriented Research in the CGIAR: Evidence and Insights from Case Studies*. A study commissioned by the Science Council Standing Panel on Impact Assessment. CGIAR Science Council Secretariat: Rome, Italy. (Available at <http://impact.cgiar.org/>)



# SCIENCE COUNCIL BRIEF

## STANDING PANEL ON IMPACT ASSESSMENT

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## Safeguarding Access to Plant Genetic Resources: the Role of Bioversity International in Establishing In-Trust Agreements

Agricultural diversity is described by the Food and Agriculture Organization of the United Nations (FAO) as a key element in food and livelihood security improvement, ensuring rural development and environmental sustainability, and providing the basis for future technological innovation in agriculture. *In situ* and *ex situ* conservation of plant genetic resources (PGRs) are essential means of preserving agricultural biodiversity. The CGIAR holds globally significant collections of germplasm related to many major food and agricultural crops.

This brief describes an assessment of Bioversity International's role – in collaboration with other partners, notably the CGIAR centers and FAO – in the policy-making process and in institutionalizing open access to germplasm from CGIAR centers.

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### CGIAR stewardship of PGRs and the need for international agreement

For plant breeders and agricultural researchers, *ex situ* conservation of PGRs, together with information on plant traits and characteristics linked to each sample are essential tools. According to the FAO *State of the World Report on Plant Genetic Resources for Food and Agriculture*<sup>1</sup> the 11 CGIAR centers that have genebanks hold over 600,000 accessions, representing approximately 10 percent of the six million accessions stored in over 1,300 genebanks around the world.

The CGIAR PGR collection and its use as a means of increasing food production, alleviating poverty and promoting economic growth led, in the 1980s and early 1990s, to questions as to who owns and controls germplasm collections conserved in CGIAR centers. At the same time,

a literature arose devoted to the topic of valuing PGRs and their use. A fundamental theme underpinning the many contributions during this period was the notion that international cooperation in PGR collection and conservation was necessary to ensure continued production of major food crops in order to increase food production and alleviate poverty<sup>2</sup>.

Common practice and stated internal policy within the CGIAR centers treated PGRs as international public goods, and the International Undertaking on Plant Genetic Resources for Food and Agriculture (PGRTA) in 1983 confirmed PGRs as a heritage of humanity that should be made freely available to anyone. Nonetheless, within a decade the Convention on Biological Diversity (CBD) had upended this understanding by explicitly recognizing the rights of sovereign states over their natural resources, including biodiversity. This allowed countries to restrict access to their PGRs. It also introduced a system governing all biodiversity, including *ex situ* collections of germplasm. The conflict between the well-established practice and internal policy of the CGIAR of making germplasm freely available, and the emerging international policy framework establishing biodiversity as a sovereign resource, raised questions about the legal status of the CGIAR collections. The issue of intellectual property ownership over improved materials became a focal point for governments, policy-makers and NGOs alike, and an intense and polarized political debate dominated the international scene surrounding PGRs.

At the same time, biotechnologies were evolving that, for the first time, raised the possibility of PGRs being developed and managed as private rather than public goods. Although not directly governed by the CBD provisions, the legal status of the CGIAR collections was left in doubt by these developments.

Broadly speaking, these debates were generated by groups, on the one side, supporting international and multilateral systems of germplasm material exchange (for example, Peru), and opposing groups claiming national sovereignty over germplasm material (for example, the Philippines). Another view was that, since such collections were derived from developing countries and were held in developing countries, an agreement could be negotiated with the host country to hold such collections only for the benefit of the developing countries.

In an attempt to inform the debate and resolve the issue of the CGIAR's collections, Bioversity<sup>3</sup> took the

lead in researching possible solutions, engaging in the policy debate and facilitating dialogue. This complex and long-running policy debate eventually culminated in the signing of the In-Trust Agreements or ITAs in 1994. The ITAs formally established an internationally accepted legal status for the center-held collections with the CGIAR holding the germplasm on a trustee basis (as opposed to outright ownership) under the auspices of the FAO. The ITAs thereby established a stable policy environment that could help ensure continued flows of germplasm both to and from the CGIAR centers.

Ninety-four percent of the total accessions held by CGIAR centers between 1994 and 2004 were held 'in-trust' (Table 1). This means that the material may be freely shared and each relevant center "...undertakes to make samples of the designated germplasm and related information available directly to users or through FAO, for the purpose of scientific research, plant breeding or genetic resource conservation, without restriction." Non in-trust material cannot be sent from a CGIAR genebank to a recipient other than the source donor or country of origin, except with special permission from the germplasm's original provider.

The ITAs provided an important practical example for the broader PGR debate beyond the CGIAR, and were an initial step towards the development of a multilateral, global system for managing PGRs. The concept was adopted as a fundamental part of the International Treaty for Plant Genetic Resources for Food and Agriculture (ITPGRFA) in 2001. The Treaty confirmed the 'in-trust' status of the CGIAR collections, and is ultimately intended to replace the ITAs. Once ratified, the CGIAR centers are expected to sign new agreements with ITPGRFA's governing body, bringing the legal status of the CGIAR collections under the auspices of the international treaty. To date, 78 FAO member states have signed the treaty and 56 have ratified it. The formalization of the status of the CGIAR collections through the ITAs and later under ITPGRFA has ensured that the collections are recognized as an important part of the multilateral global system for the conservation and use of genetic resources for food and agriculture.

## Bioversity's role and contribution

In order to respond to the emerging issues related to PGRs and the status of the CGIAR collection, and to inform the debate, Bioversity initiated three types of action:

**Table 1.**  
**CGIAR accessions by center and status (1994–2004)**

Center	In-trust	Percentage of total in-trust	Non in-trust	Percentage of total non in-trust	Total collection	Total percentage in-trust
ICARDA	127,378	21.2	12,811	36.2	140,189	90.9
CIMMYT	117,852	19.6	2,675	7.6	120,527	97.8
ICRISAT	113,823	18.9	1,042	2.9	114,865	99.1
IRRI	102,752	17.1	5,520	15.6	108,272	94.9
CIAT	64,887	10.8	7,375	20.8	72,262	89.8
IITA	25,789	4.3	1,807	5.1	27,596	93.5
ILRI	18,661	3.1	1,516	4.3	20,177	92.5
WARDA	14,751	2.5	8	0.0	14,759	99.9
CIP	14,418	2.4	643	1.8	15,061	95.7
Bioversity/INIBAP	987	0.2	253	0.7	1,240	79.6
ICRAF	25	0.0	1,760	5.0	1,785	1.4
Total	601,323	100	35,410	100	636,733	94.4

Source: SINGER database

- Commissioned research by Wolfgang Siebeck and John Barton to examine the issue of control and ownership of the CGIAR collections. This resulted in a paper<sup>4</sup>, published in 1992 that proposed that the concept of 'trusteeship' be applied to the CGIAR collections.
- Disseminated technical papers and held seminars in order to inform interested parties, and to reduce the sense of uncertainty created by the CBD, throughout the ITA negotiation process.
- Facilitated dialogue among a range of institutions and partners. These included CGIAR centers, governments of countries hosting CGIAR genebanks, FAO and its constituencies, farmers' rights advocacy groups, and other stakeholders.

## Assessing the impact

The extent of Bioversity's influence in driving forward the ITA negotiations was the subject of a case study analysis. Various sources of information were used to inform the analysis, including articles written by Bioversity researchers prior to the establishment of the ITAs, official reports and other documents from key institutions involved in the ITA negotiations, key informant interviews and press reports.

Key informants were selected non-randomly on the basis of their specialized, in-depth knowledge and unique perspectives. The study team identified such

informants as individuals who were intimately familiar with the events that had taken place around the ITA negotiations. They included people who could provide Bioversity's own perspective, people from external organizations who were actively involved in the process, and organizations with no direct role in the negotiations but good knowledge and understanding of the debate. In total 16 key informants were interviewed.

The analysis showed that Bioversity's work related to the formalization of the legal status of the CGIAR collections was integral to its mandate as an organization and there was thus no specific inception point delimiting its commencement. The work was executed without a distinct budget or location, and was conducted and implemented by personnel from a broad cross-section of the institution, including those at the highest levels. Specific findings from the analysis of Bioversity's role include the following conclusions:

1. In a highly polarized debate, Bioversity acted as an honest broker that commanded the necessary degree of trust from a diverse group of participants.
2. The research conducted by Siebeck and Barton, supported by Bioversity, elaborated the concept of in-trust status for germplasm. This concept was successfully applied to the CGIAR collections during the negotiation process that eventually led to the establishment of the ITAs.

3. Bioversity provided technical information, based on its own work over many years, and synthesized from the work of other CGIAR centers, and other institutions working with PGRs. For example, Bioversity was responsible for managing the SINGER Phase 1 database that publicly provided information about flows of germplasm into and out of CGIAR genebanks. Using these data, Bioversity was able to explain and demonstrate to the countries negotiating the International Treaty what interdependence on PGRs actually means in practical terms.
4. Bioversity was instrumental in instigating contact between institutions and partners who would not normally encounter each other or share ideas. For example, it played a leading role in organizing meetings of the Crucible Group. This group comprised representatives of grassroots organizations, agricultural researchers, intellectual property specialists, trade negotiators, and agricultural policy analysts from the South and the North. The Group aimed to bring together individuals with widely differing views to produce a report in which consensus views were expressed when possible. On issues where the participants did not agree, the report provided an opportunity for each 'side' to put forward their arguments. Bioversity was significantly involved in organizing meetings of the Crucible Group and supported publication of the report.
5. Bioversity was a constant presence at most, if not all, of the debates and brought rationality, expert knowledge and strong negotiating skills to the tasks in hand. Bioversity was mandated by the CGIAR to represent issues associated with genetic resources policy by virtue of its role as the convening center for the System-wide Genetic Resources Programme and the Genetic Resources Policy Committee. This enabled Bioversity to play the leading role in terms of representing the CGIAR in the policy dialogue and also in developing understanding and commitment among CGIAR centers.

## Counting costs

Assessing the cost of Bioversity's contributions to the development of the ITAs is not straightforward, as the

work was an integral part of Bioversity's core mission, staff roles evolved and changed over time, and there was no clear start date to Bioversity's involvement. A very approximate consideration of research and non-research outputs associated with the process to establish the ITAs suggests that Bioversity invested approximately US\$100,000.

Comparing these costs to the actual value of the CGIAR collections is also a difficult task, as this value has never been calculated. An evaluation of the economic role of the International Rice Research Institute (IRRI) in improving rice cultivars<sup>5</sup> estimated IRRI's global economic impact to be in the order of US\$1.9 billion over a 20-year period. Moreover, according to the same study, the present value of a single accession incorporated successfully into a modern variety is estimated to be nearly US\$50 million, and an estimated 1,000 catalogued accessions are accredited a value of around US\$325 million.

This analysis confirmed the important and leading role that Bioversity played in the process of developing ITAs, both through commissioned and in-house research and through other active involvement in the policy process. A small investment of approximately US\$100,000 by Bioversity contributed to maintaining the CGIAR collections safely in the public domain. These collections have enormous, if inestimable, value for their contributions to plant breeding, increasing crop productivity, and other potential future uses.

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## Notes

- 1 FAO (Food and Agriculture Organization of the United Nations). 1996. *State of the World Report on Plant Genetic Resources for Food and Agriculture (PGRFA)*. FAO: Rome, Italy.
- 2 See, for example, Cooper, D., Engels, J.M.M., and Frison, E.A. 1994. *A Multi-lateral System for Plant Genetic Resources: Imperatives, Achievements, and Challenges*. Issues in Genetic Resources No. 2. International Plant Genetic Resources Institute (IPGRI): Rome, Italy.
- 3 The name Bioversity International (or Bioversity) is used to refer to the activities of The International Board for Plant Genetic Resources (IBPGR) from 1974 to 1991, and The International Plant Genetic Resources Institute (IPGRI) from 1991 to 2006. With effect from December 2006, IPGRI and INIBAP (The International Network for the Improvement of Banana and Plantain) have operated under the name 'Bioversity International'.
- 4 Siebeck, W. and Barton, J. 1992. The implications of applying the legal concept of trust to germplasm collections at CGIAR research centres. *Diversity*, 8(3), 29–35.
- 5 Evenson, R. and Gollin, D. 1997. Genetic resources, international organizations, and improvement in rice varieties. *Economic Development and Cultural Change*, 45(3), 471–500.