

How uncertain policy regulations affect germplasm acquisition and distribution?

IMPACT ASSESSMENT BRIEF NUMBER 2

Bioversity International's series of Impact Assessment Briefs aims to inform readers about the major results of evaluations carried out by the centre. The Briefs summarize conclusions and methods of more formal papers published in peer-reviewed journals.

This brief describes the influence of the 1994 In-Trust Agreements (ITAs) on acquisition and distribution of germplasm held by the International Research Rice Institute (IRRI) genebank.

The ITAs, signed in 1994, legally affirmed the 'public good' status of the CGIAR collections and placed them 'In Trust' for the benefit of the world community under agreements with the Food and Agriculture Organization of the United Nations (FAO). They were established as a consequence of the legal uncertainty brought about in 1993 by the Convention on Biological Diversity (CBD) Article 15, which explicitly recognized the rights of sovereign states over their natural resources. Article 15 stressed that the authority to determine access to genetic resources remained the responsibility of national governments; and acknowledged, explicitly, the role of national legislation in matters related to genetic resources, which could severely restrict the flow of plant genetic resources for food and agriculture (PGRFA) or make it much more difficult to exchange. These

developments raised questions about the ownership, control and legal status of germplasm collections conserved in Consultative Group on International Agricultural Research (CGIAR) genebanks.

In the context of emerging issues related to plant genetic resources and the status of the CGIAR collections, Bioversity, acting within its mandate to advance the conservation and use of plant genetic resources for the benefit of humanity, initiated three types of action:

1. Commissioning of research to examine the issue of control and ownership of the CGIAR collections, including a paper, published in 1992, that proposed that the concept of 'trusteeship' be applied to the CGIAR collections.
2. Dissemination of technical papers and sponsorship of seminars to inform interested parties and reduce the sense of uncertainty created by the CBD.
3. Facilitation of dialogue among a range of institutions and partners who otherwise would not have been in contact but whose collaboration is essential to the success of any policy solution. These included CGIAR Centers, governments of countries hosting CGIAR genebanks, FAO and its constituencies, farmers' rights advocacy groups, and other stakeholders.

The synergies created by these actions facilitated the negotiation of the ITAs (for a detailed assessment of Bioversity's role in the ITAs negotiation please see Gotor et al 2010,) which initiated a formal system of multilateral access to CGIAR-held genetic resources being conserved ex situ (i.e., outside their original or natural habitat). The expected impact of the ITAs was to maintain flows of germplasm both to and from the CGIAR centres.

The outcomes presented here are based on a statistical analysis performed on the movement of IRRI-held germplasm following the 1994 introduction of the ITAs. This analysis tested the assumption that the ITAs brought about improvements in the availability and



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subsequent use of germplasm that, given the uncertainty caused by the CBD, would otherwise have failed to occur.

As pointed out in a study conducted by Gotor et al. (2010), the CBD may have resulted in a "... real possibility of acrimonious international demands for returns of some collections...", and that "germplasm exchange would have come to an end [if an agreement had not been reached] because the International Agricultural Research Centers could hardly operate outside international law. The statistical results generated supported the hypothesis that the ITAs and the accompanying more stable political environment had a significant positive effect on germplasm distribution, and thus on international agricultural research—and its ultimate beneficiaries—in general.

A CHANGE IN LEGAL FRAMEWORK

Conservation of plant genetic resources (PGR) is essential for the preservation of agricultural biodiversity, which is a key element in improving food and livelihood security, ensuring rural development and environmental sustainability, and providing the basis for future technological innovation in agriculture. CGIAR germplasm collections were established with the intention of compiling genetic material of major staple crops in order to conserve agricultural biodiversity as well as make it freely available for breeding. In total, the 11 CGIAR centres that have genebanks hold more than 600,000 accessions (samples of crop varieties or wild relatives collected at specific locations and times), representing approximately 10% of the 6 million accessions stored in over 1,300 genebanks around the world.

With the entry into force of the CBD, countries could begin to exercise their national sovereignty by increasing restrictions on access to PGRs. This would have meant that without the ITAs, CGIAR centres would have been compelled to comply with international law and countries that had contributed germplasm to CGIAR collections could have demanded its return or stipulated that centres holding the PGRs must limit their further distribution and use.

Furthermore, countries hosting CGIAR genebanks could have considered any germplasm in these genebanks as falling under their sovereign rights because the material was technically located within the borders of that country. Such policy uncertainty with respect to CGIAR genetic resources threatened to impede the free distribution and acquisition of germplasm (including the flows occurring between CGIAR centres), thus stifling agricultural research and development globally.

“ The In-Trust Agreements and the accompanying more stable political environment had a significant positive effect on germplasm distribution ”

In 1994, however, the introduction of the ITAs initiated a formal system of multilateral access to CGIAR-held genetic resources being conserved *ex situ*. Under the ITAs, CGIAR centres regard themselves as trustees—not as owners—of these collections, managing them on behalf of their beneficiaries, in particular developing countries. Under this arrangement, the centres are obliged to conserve the material to the highest technical standards, to duplicate it for safety reasons, to make it available without restrictions, and to seek no intellectual property rights over it.

This last obligation included a transfer mechanism designed to prevent any other party subsequently making the collections unavailable for research and breeding. Furthermore, recipients of transferred germplasm and its related information were bound by the same conditions as the centres themselves.

THE INTERNATIONAL RICE GENE BANK COLLECTION

The International Rice Genebank collection at IRRI comprises the largest collection of rice germplasm held in-trust for the world community. Of 109,055 accessions collected worldwide from 1961 to 2006, the vast majority (94.4%) are in-trust. IRRI maintains records of breeding pedigrees of all modern rice varieties derived from crossing traditional varieties.

Trends in acquisitions change significantly over time, with accession contributions fluctuating for various reasons. The extended peak of germplasm acquisition during the 1970s occurred at a time when high levels of core funding were available, leading IRRI to set a goal of establishing a large and diverse collection. The second major peak, which occurred in the late 1990s, correlates with a targeted expansion of the collection. The decline in acquisitions through the 1980s and early 1990s, was associated with the adoption of a more directed and efficient acquisition strategy rather than a lack of funds or political uncertainty. Adding a new

Table 1. Germplasm acquired by IRRI from the top 9 contributing countries (1961–2006).

Country	Acquired pre 94 *	Acquired post 94 *
India	507	2
Indonesia	507	2
China	232	34
Thailand	180	32
Bangladesh	179	21
Philippines	133	173
Malaysia	95	88
Laos	61	1027
Cambodia	56	233

*Average per year. Source: IRRI genebank database.

accession to the collection increases operational costs by a fixed amount regardless of the size of the collection, but gives diminishing returns as the size of the collection increases. That is, adding a new accession to a large collection may add little or no value if it duplicates material already conserved. Therefore, as the collection grew, IRRI was increasingly careful to ensure that new accessions added value.

RICE GERMLASM COLLECTION BEFORE AND AFTER THE CONVENTION ON BIOLOGICAL DIVERSITY

Table 1 shows the 9 countries that have contributed the most accessions to IRRI up to 2006, with India, Laos, Indonesia and China accounting for 44% of total accessions.

It appears that trends in donations from a number of countries changed around 1994, when the CBD came into force. For example, India was a major donor prior to 1994, contributing an average of 507 samples per year. This number dropped to two per year after 1994, with a similar trend for other key donors. The end result of this is that more of India's rice diversity is likely to be conserved in India than in the IRRI genebank. On the other hand, Laos, thanks also to special collecting mission programmes, increased its donations after 1994, with contributions rising from an average of 61 per year to 1027 per year. IRRI's collection of accessions originating from Laos (of approximately 15,000 accessions) is considered to be very complete and is a large representative of Laos' diversity. The case of India provides an example of how countries moved away from the multilateral system of free exchange of germplasm so as to avoid a perceived loss of proprietary rights to their indigenous germplasm resources. Laos, however, represents a special case.

Figure 1 shows the trend of germplasm distributed by IRRI for a range of reasons, including restoration of germplasm to countries of origin, use within the IRRI research program, and a broad category that includes all other purposes.

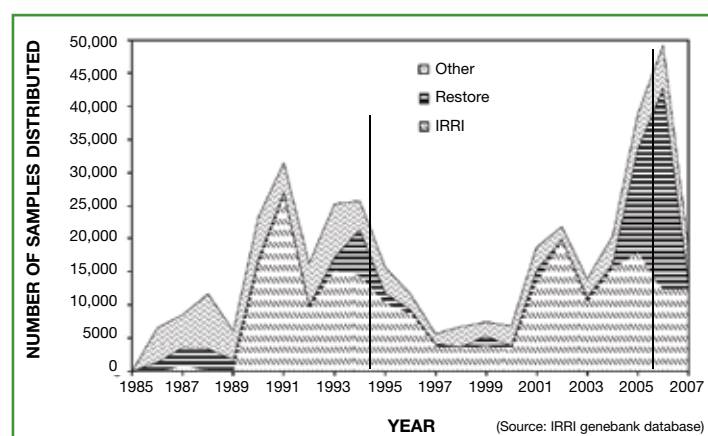


Figure 1. IRRI Germplasm distribution 1983–2006.

Distribution of germplasm beyond IRRI is vulnerable to political uncertainty—such as that experienced around the introduction of new legal frameworks—since its movement

“ Distribution of germplasm is vulnerable to political uncertainty ”

depends on the legal status attached to the accessions. Special attention is given here to the germplasm distributed to its country of origin for restoration purposes. The quantity of germplasm distributed for restoration peaked in the 1990s and again in 2004–06. These peaks are associated with the periods of uncertainty brought about by the CBD in the mid 1990s, and by the introduction of a new Standard Material Transfer Agreement (SMTA) that governed procedures for germplasm transfers associated with the International Treaty for Plant Genetic Resources for Food and Agriculture (the Treaty), which was adopted in late 2001.

Results generated by a statistical analysis of data on IRRI germplasm distributed for restoration during the 90s suggest that a significant change emerged immediately following the establishment of the ITAs. Attributing such a change to a single event does not reflect the reality of the situation, in which many issues related to both policy and other factors would affect requests for and actual distribution of germplasm. However, as Gotor *et al.* (2010) demonstrated throughout a qualitative analysis based on semi-structured interviews with key informants, the analysis supports the possibility that the introduction of the ITAs and the accompanying stable political environment had a significant positive effect on germplasm distribution.

Without the stabilizing influence of the ITAs, the CBD-catalyzed increase in demand for germplasm material for restoration, combined with a reduction in acquisitions, would have considerably diminished the size of IRRI genebank. The potential drop in, or even complete cessation of, exchange of PGR would have severely stifled international agricultural research. However, as the policy environment became more stable, the genebank was able to rebuild its holdings to the pre-CBD level—something that may not have occurred if the policy environment had remained uncertain.

REFERENCE

Gotor E, Caracciolo F, Watts J., 2010: The Perceived Impact of the In-Trust Agreements on CGIAR Germplasm Availability: An Assessment of Bioversity International's Institutional Activities. *World Development* Vol. 38, No. 10, pp. 1486–1493.

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