



Tropentag, September 11-13, 2024, hybrid conference

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Seeds of change: unlocking the potential of plant genetic material transfer for food and agriculture

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Abstract

Conserving and exchanging plant genetic resources in agriculture is crucial for addressing food security, climate resilience, and agricultural sustainability, as it enhances breeding programs. The global exchange of genetic material may result in more resilient and productive crops by combining favourable traits from different genetic accessions. This contributes to achieving SDG-2 Zero Hunger, SDG-13 Climate Action, and SDG-17 Developmental Strategic Financing. This paper explores the prospective economic impact of Colombia's upcoming ratification of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) through an analysis of multiple case studies, illustrating the potential benefits derived from genetic material exchange and the risks involved, along with the fair distribution of benefits through the treaty's multilateral system.

We analyse cases where genetic accession transfer has led to positive outcomes. For instance, in Colombia, the adoption of the TAI8 improved cassava variety has significantly increased productivity, generating benefits worth USD 1.6 million between 2005 and 2022. Without collaboration, results suggest that the costs could outweigh the benefits. The continuous flow of genetic material, facilitated by the CIAT genebank, from other parts of the world into Colombia's research institutions (e.g., government or private) has contributed to the development of improved varieties aimed at ensuring national food security. Moreover, genetic transfers offer potential solutions for present and future challenges, such as developing resistance to diseases like cassava brown streak disease (CBSD) in Africa and Fusarium R4T in banana crops.

While focusing on the benefits of open genetic material exchange, this paper also discusses the importance of equitable benefit-sharing and raises concerns about ensuring the fair distribution of these benefits among stakeholders. The study concludes with a discussion on developing robust seed systems and implementing measures to support sustainable agriculture and food security in Colombia and beyond.

Keywords: Food security, plant genetic resources, seed policies