CONSERVATION AND USE OF CACAO GENETIC RESOURCES BY GENE BANKS AND NURSERIES IN SIX LATIN AMERICAN COUNTRIES

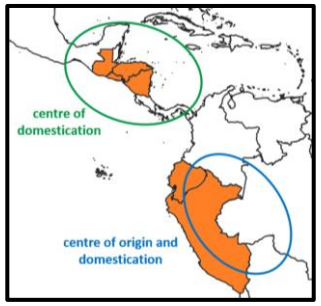
Viviana Ceccarelli [a,b,*]

[a]Bioversity International, Lima, Peru, [b]University of Leeds, Ecology and Global Change Group, UK, * email: gyvc@leeds.ac.uk

ABSTRACT

Cacao (*Theobroma cacao* L.) is among the most important tree cash crops in the tropics. The wide cacao genetic diversity present within Latin American countries can help to improve the sustainability and farmers' income of cacao cultivation but it has been mostly underused so far. In this study we assessed the current state of conservation and use of cacao genetic materials in six Latin American countries (Peru, Ecuador, Nicaragua, Honduras, El Salvador, Guatemala). To this aim, for each country, we evaluated the countries' systems of certification, verification and traceability, we carried out a survey on 176 gene banks and nurseries, and we performed a review of existing breeding and selection programs. Based on the results obtained, we identified the main areas for investments in the six country.

INTRODUCTION



- Cacao is an important source of livelihood for thousands of farmers in Latin America
- Cacao genetic diversity represents a key resource to improve the sustainability of cacao cultivation and farmers' income
- As the cacao centre of origin and domestication, Latin America presents a wide cacao genetic diversity of cacao but this has been often underused

The objective of this study was to asses the current state of conservation and use of cacao genetic materials in six Latin American countries (Peru, Ecuador, Nicaragua, Honduras, El Salvador, Guatemala), with the aim of identifying the most appropriate needs and opportunities for investment for these countries.

METHODOLOGY

For the methodology, for each of the six countries, we:

1. Assessed the country's performance in terms of certification, verification and traceability of cacao genetic resources
2. Carried out an extensive survey on 176 gene banks and nurseries.
3. Performed a review of the existing breeding and selection programs.

RESULTS

- All countries currently have poor to basic systems of certification, verification and especially traceability.
- Gene banks and nurseries have low levels of characterization of conserved materials, and in Central American countries conserve mostly international clones and few local varieties (Fig. 1-2)
- Despite gene banks and nurseries conserving several promising varieties, these has been rarely used in breeding and selection programs or released to farmers

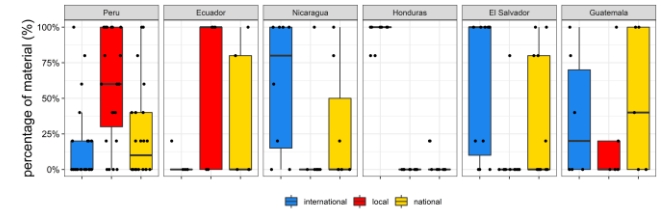


Fig. 1 Origin of materials in the gene banks across the six countries. The boxplots represent the percentages of local (red), national (yellow) and international (blue) materials in GB/CG in the six countries. Black points represent the percentages of the individual GB/CG surveyed.

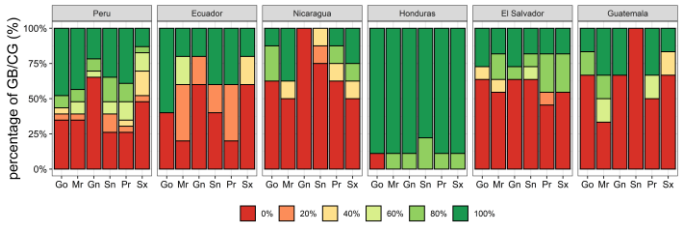


Fig. 2 Characterization of materials in the gene banks across the six countries. The bars represent percentages of materials characterized from 0% (red) to 100% (green) in terms of georeferencing (Go), morphologicy (Mr), genetic (Gn), sensorial quality (Sn), productivity (Pr), and sexual compatibility (Sx).

CONCLUSIONS

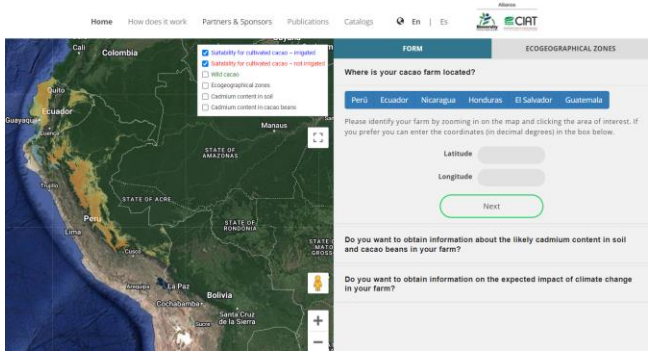
Based on the results, the main areas for investments in the six countries are:

1. Development of a strong system of certification, verification and traceability
2. Better characterization of materials in gene banks and nurseries
3. Collection of local varieties and reactivation of breeding and selection programs
4. Better access for farmers to cacao varieties from gene banks and nurseries

A better conservation and use of cacao genetic resources in Latin America would improve the income of cacao farmers in these countries

CACAODIVERSITY – www.cacaodiversity.org

The results from the survey of gene banks and nurseries have been integrated into the online tool CacaoDiversity which provides location-specific information for cacao farmers about where to source appropriate propagation material for their farms.



CO-AUTHORS AND ACKNOWLEDGEMENTS

Sphyros Lastra[a], Rey Loor Solórzano[c], Walter Chacón[d], Mario Nolasco[d], Ignacio Sotomayor[c], Luis Fernando Plaza Avellán[c], Diana Aracelly López[c], Fabian Fernández Anchundia[c], Dominique Dessauw[e,f], Luis Orozco-Aguilar[g], Evert Thomas[a]

[a]Bioversity International, Lima, Peru, [b]University of Leeds, Ecology and Global Change Group, UK, [c]Instituto Nacional de Investigaciones Agropecuarias, Programa Nacional de Cacao y Café, Ecuador, [d]Consultant in Environmental Management, [e]CATIE, Turrialba, Costa Rica, [f]CIRAD, Montpellier, France, [g]World Lutheran Relief, IMA World Health

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