

## Global Strategy for the Conservation and Use of Capsicum Genetic Resources

Peter Giovannini, Crop Trust



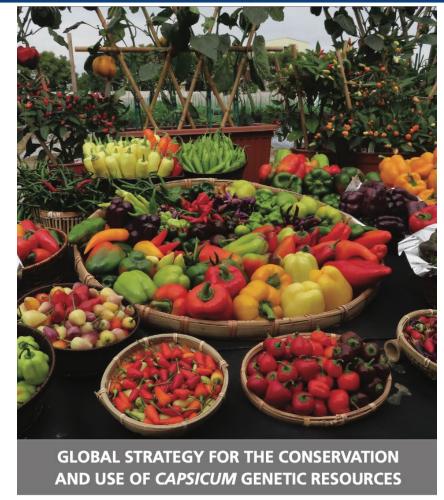
#### The strategy

Barchenger D.W. and Khoury C.K. 2022.

A Global Strategy for the Conservation and Use of Capsicum Genetic Resources.

Global Crop Diversity Trust. Bonn, Germany.

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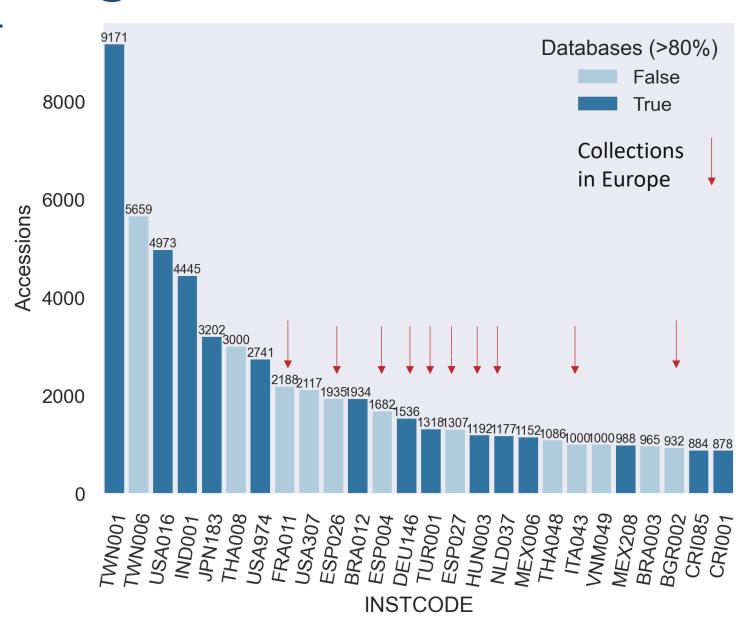






#### Global Ex Situ Holdings

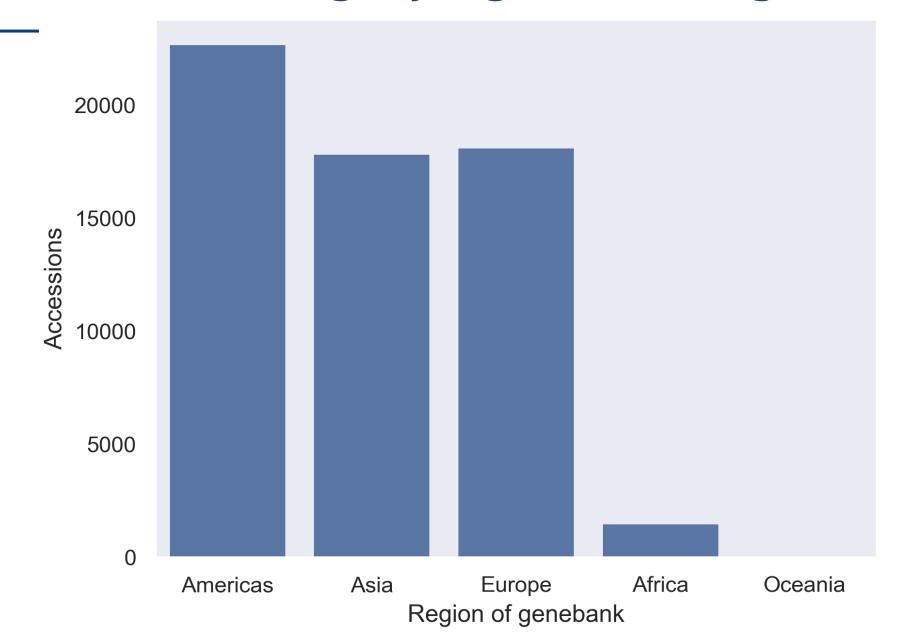
- > 50K accessions globally
- Unknown how many of these are highly distinct/unique
- Large percentage of accession level data not yet in open databases
- TWN001, FRA011, USA016, NLD037, DEU146, ESP026 conserve material from more than 50 countries



INSTCODE Accessions*		ACRONYM	
FRA011	2188	Centre de Ressources Biologiques Légumes INRA-AVIGNON	
ESP026	1935	Universidad Politécnica de Valencia BGUPV	
ESP004	1682	Centro Nactional de recursos fitigenéticos CRF	
DEU146	1536	Leibniz Institute of Plant Genetics and Crop Plant Research- IPK	
ESP027	1307	CITA-HOR	
HUN003	1192	Institute for Agrobotany (RCA)	
NLD037	1177	Centre for Genetic Resources, the Netherlands Plant Research International - CGN	
ITA043	1000	Research Centre for Vegetable and Ornamental Crops	
BGR002	932	Maritsa Vegetable Crops Research Institute	
UKR021	754	Institute of Vegetable and Melon Growing (IOB)	
BGR001	746	Institute for Plant Genetic Resources 'K.Malkov' - IPGR	
MKD001	650	Dept. of Genetics and Plant Breeding Ss. Cyril and Methodius University Skopje	
CZE122	530	Crop Research Institute CRI	*Source: Survey (2021) or open databases (Genesys and WIEWS)
MDA010	430	Laboratory for Plant Genetic Resources (LPGR)	
POL003	335	Plant Breeding and Acclimatization Institute (IHAR)	
PRT001	236	Portuguese Bank of Plant Germplasm	

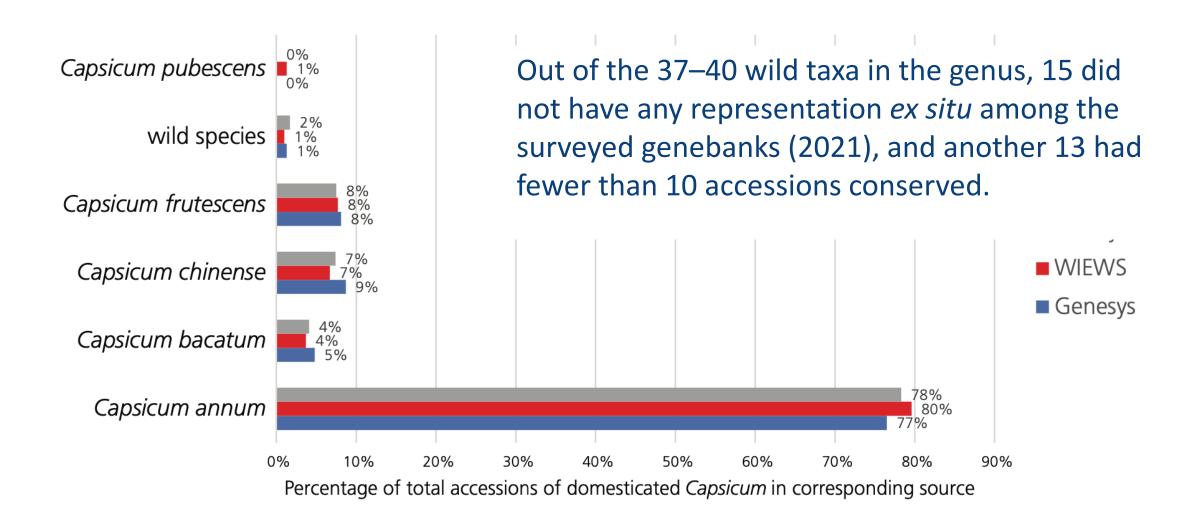


#### Global Ex Situ holdings by region of holding institute





#### Global Ex Situ Holdings





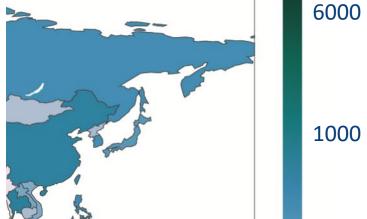
#### Global Ex Situ Holdings: origin of accessions

Accessions

Capsicum annuum var. annuum from West and Central Africa is particularly poorly represented in ex situ collections, likewise in South Asia, Myanmar, Nepal and Bhutan are underrepresented, and in Southeast Asia, Cambodia and Laos. In South America, Venezuela, Paraguay, Uruguay, Suriname and Chile have a low absolute number of accessions

A similar assessment conducted for *Capsicum chinense* suggests that the Central Africa and West Africa secondary regions of diversity are not well represented in *ex situ* collections. Also, Southeast Asia, and East Asia have a low number of accessions conserved *ex situ* 

C. pubescens were mostly collected in Peru, while Mexico, the Central American countries, and Ecuador, Colombia, and Bolivia are not as well represented in ex situ collections



100

1 10

7



#### Global collection: origin of Capsicum accessions

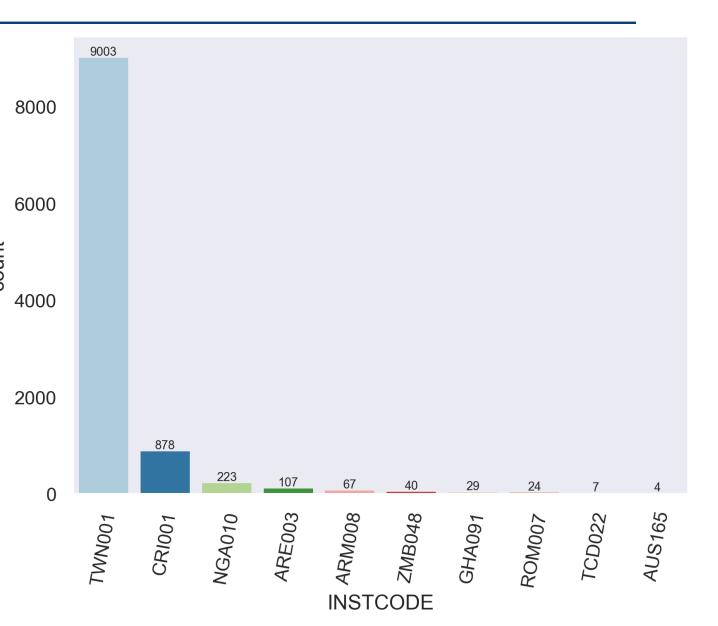




#### Global Ex Situ Holdings: access



- 7,992 exchanges of Capsicum via SMTA (Data Store)
- 35,000 samples and 9,646 acc. Distributed (FAO WIEWS)
- 10,471 acc. included in MLS (GLIS 2025)
- Uneven distribution pattern
- The USDA-ARS is the largest distributor

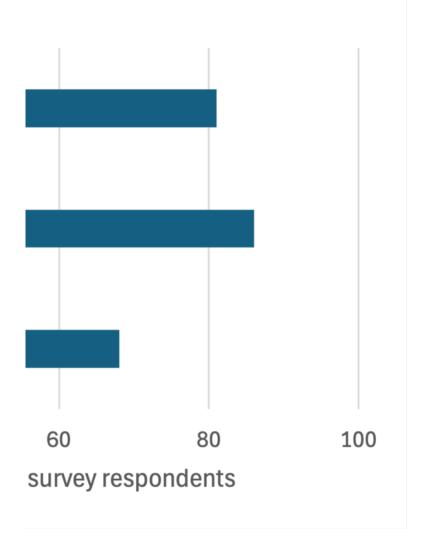




#### Storage of Capsicum PGR

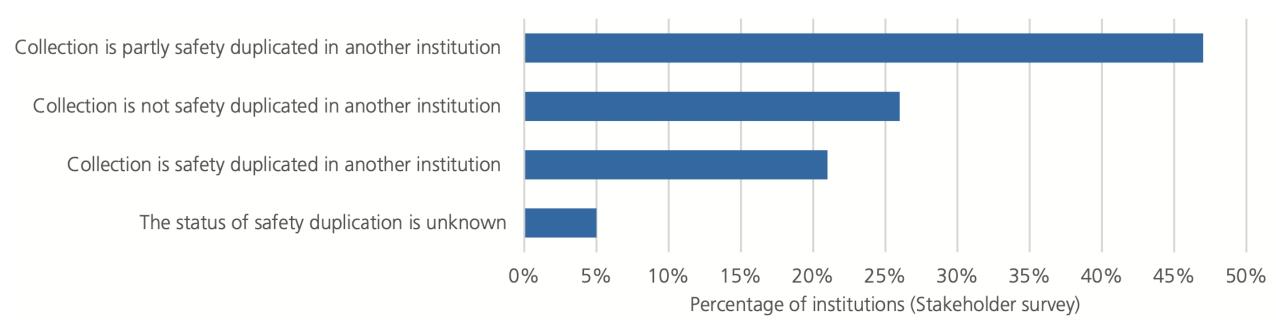
 Some Capsicum wild species have recalcitrant seeds (Barchenger and Bosland, 2019).

 New Mexico State University maintains live plants of several recalcitrant wild Capsicum species to ensure they are not lost (P.W. Bosland, pers. comm.).





#### **Survey: Safety duplication**



Source: Survey (2021) n = 40



ocation of the safety duplicates

#### **Survey: Safety duplication**



#### Important back-up sites:

Integrated in anothe

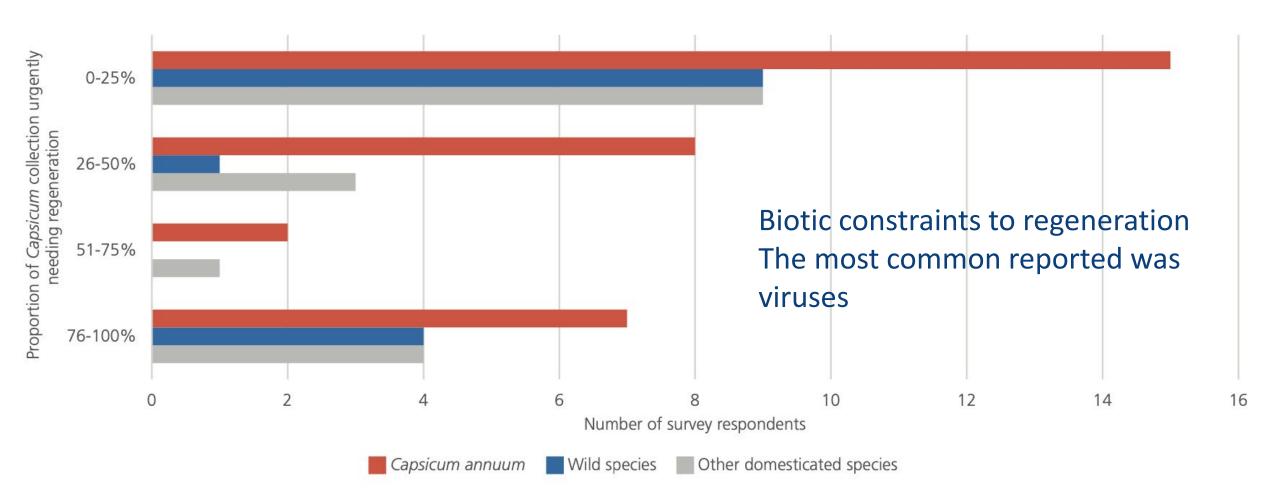
- Svalbard Global Seed Vault
- USDA National Laboratory for Genetic Resources Preservation
- Centro Nacional de Recursos Fitogenéticos (Spain)
- Warwick Genetic Resources Unit (UK)
- RDA genebank (Republic of Korea).
- National Plant Genetic Resources Centre (Taiwan)
- Embrapa Hortaliças (Brazil).

30%

Capsicum accessions stored at SGSV 11,279 (22% of estimated global collection) Source: SGSV Seed Portal 2025)



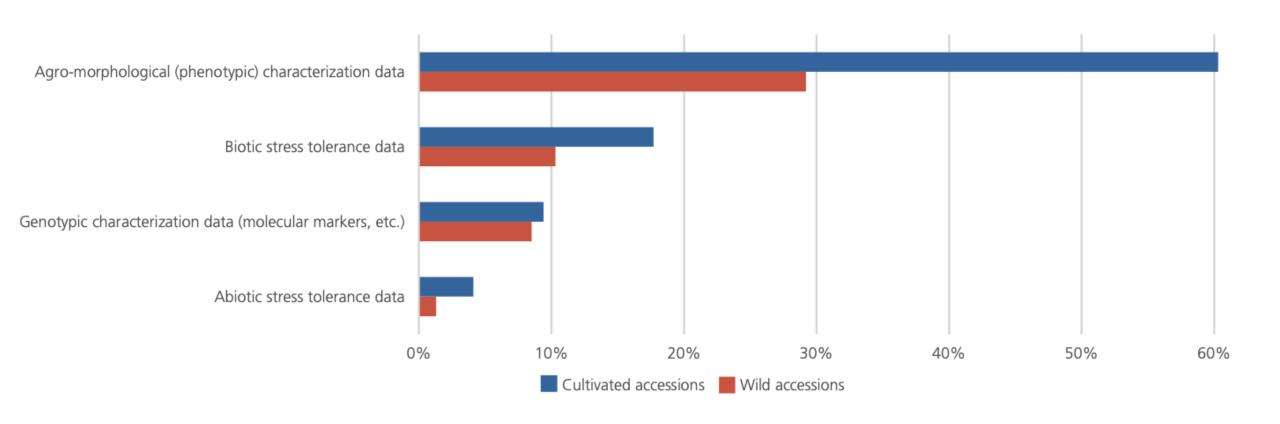
#### Regeneration



Source: Survey (2021) n = 40



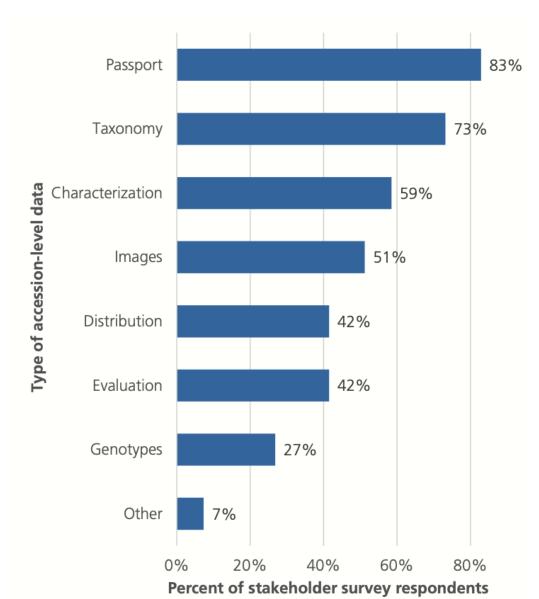
### **Characterization and Evaluation**



Source: Survey (2021) n = 40



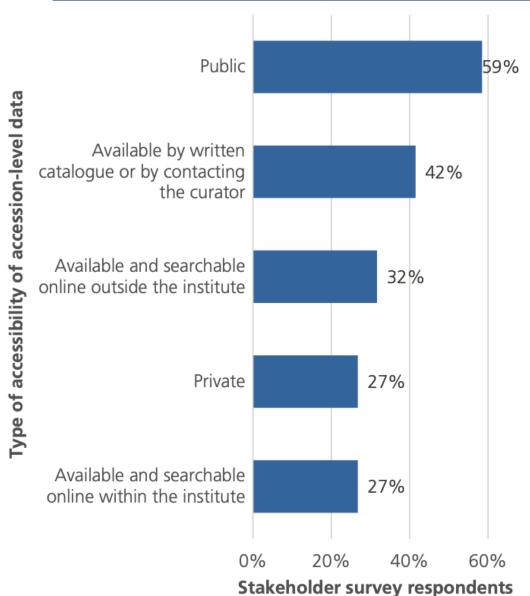
#### **Documentation and information sharing**



Source: Survey (2021) n = 40



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Source: Survey (2021) n = 40



# Recommendations & relevance to ECPGR

- Prioritize wild species collection in Brazil, Andes, Mesoamerica
- Strengthen long-term conservation
- Ensure safety duplication across collections
- Study storage viability and define best practices
- Regenerate accessions
- Collaborate on characterization & evaluation
- Improve global data accessibility and quality

