PROYECTO agro biodiversidad mexicana

CONABIO
COMISIÓN NACIONAL PARA EL CONOCIMIENTO Y USO DE LA BIODIVERSIDAD

An information system to support agrobiodiversity conservation

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October 6th, 2021

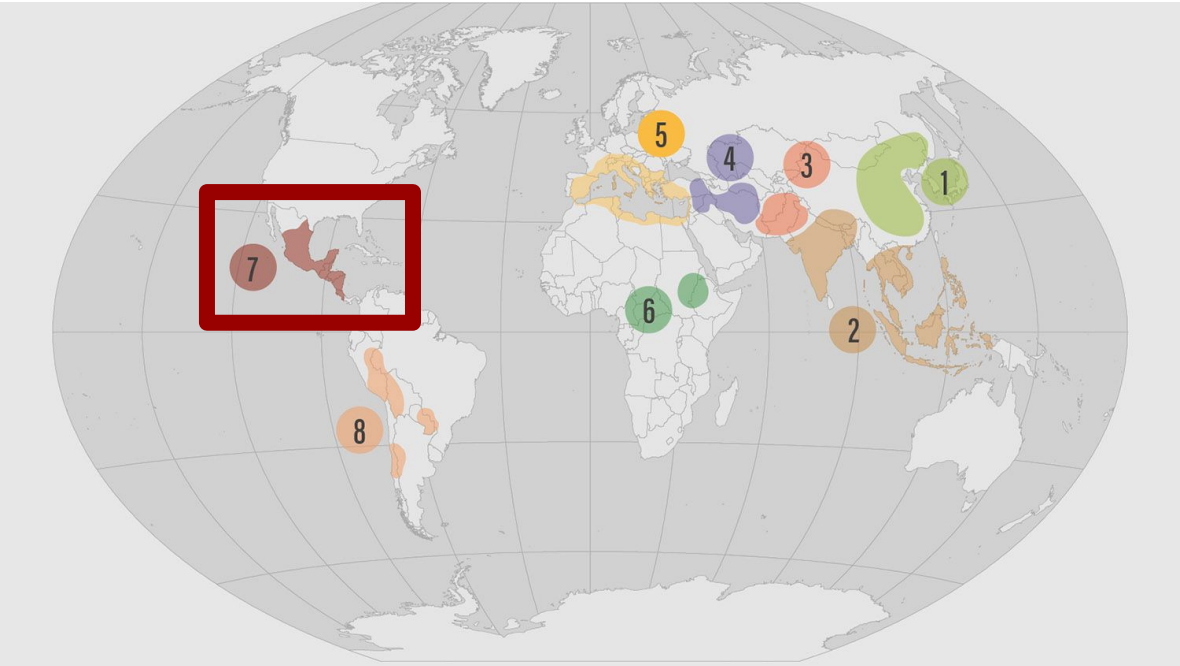
CONABIO

- National Commission for the Knowledge and Use of Biodiversity.
- CONABIO **coordinates** biodiversity data collection and preservation in Mexico.
- GBIF national node:
  - 14 million specimen records.
  - Data standards (Darwin Core).
  - High quality control.
- Recent interest in agrobiodiversity.

https://www.gob.mx/conabio

Agrobiodiversity in Mexico

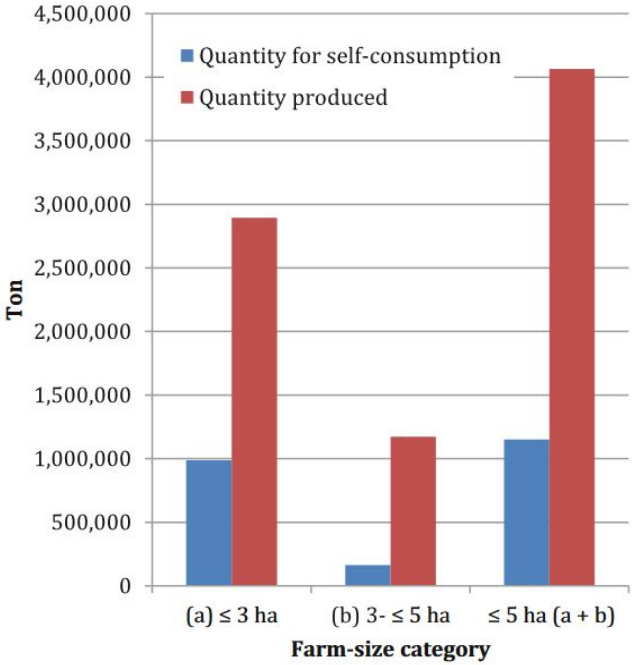
Mexico is a center of crop domestication & diversification, where domestication **continues today**



Vavilov's centers of origin of cultivated plants. [Map source.]

Agrobiodiversity in Mexico

Smallholders are heirs of this rich agrobiodiversity and also crucial for food security



Bellon et al. (2021) *Food security.*
Bellon et al. (2018) *PRSB.*

Information system for agrobiodiversity

- Mexican Agrobiodiversity GEF project:
  - Native crops in traditional agriculture.
  - Knowledge, policy, markets, local capacities.
- Information system for agrobiodiversity (**SIAgro**):
  - Generate and systematize open data.
  - Inform food security and conservation policies.

Funding source

Implementing agency

Executing agency

Agrobiodiversity data

Global Native Maize Project

Accessions

Agronomic data

Quantitative and qualitative

26,500 records

Photo by C. Galindo

Field data collection

Accessions, specimens, and observations

With local communities

Biological, geographical, socioeconomic, cultural data

Photo by Archivo GECI

Nutritional data

Quantitative data

From partner institutions

Photo by A. Ríos

Agrobiodiversity data

Focus groups

Qualitative assessments of production, commerce, consumption

With local communities

Photo by P. Cruz

Regional food baskets for healthy eating

Healthy eating plate at regional level

Local ingredients, recipes, traditions

Image by Daniela Cafaggi

FAIR challenges

- Diverse data types.
- Data generated with local communities and donors.

- Integration?
- Data standards?
- Protocols for quality control?
- Data reuse?

data type	example
Biological	taxon, habitat
Geographical	coordinates
Social	local donors
Cultural	use, common names
Agronomic	yield, associated crops

Photo by Simone Secci

Designing for FAIR

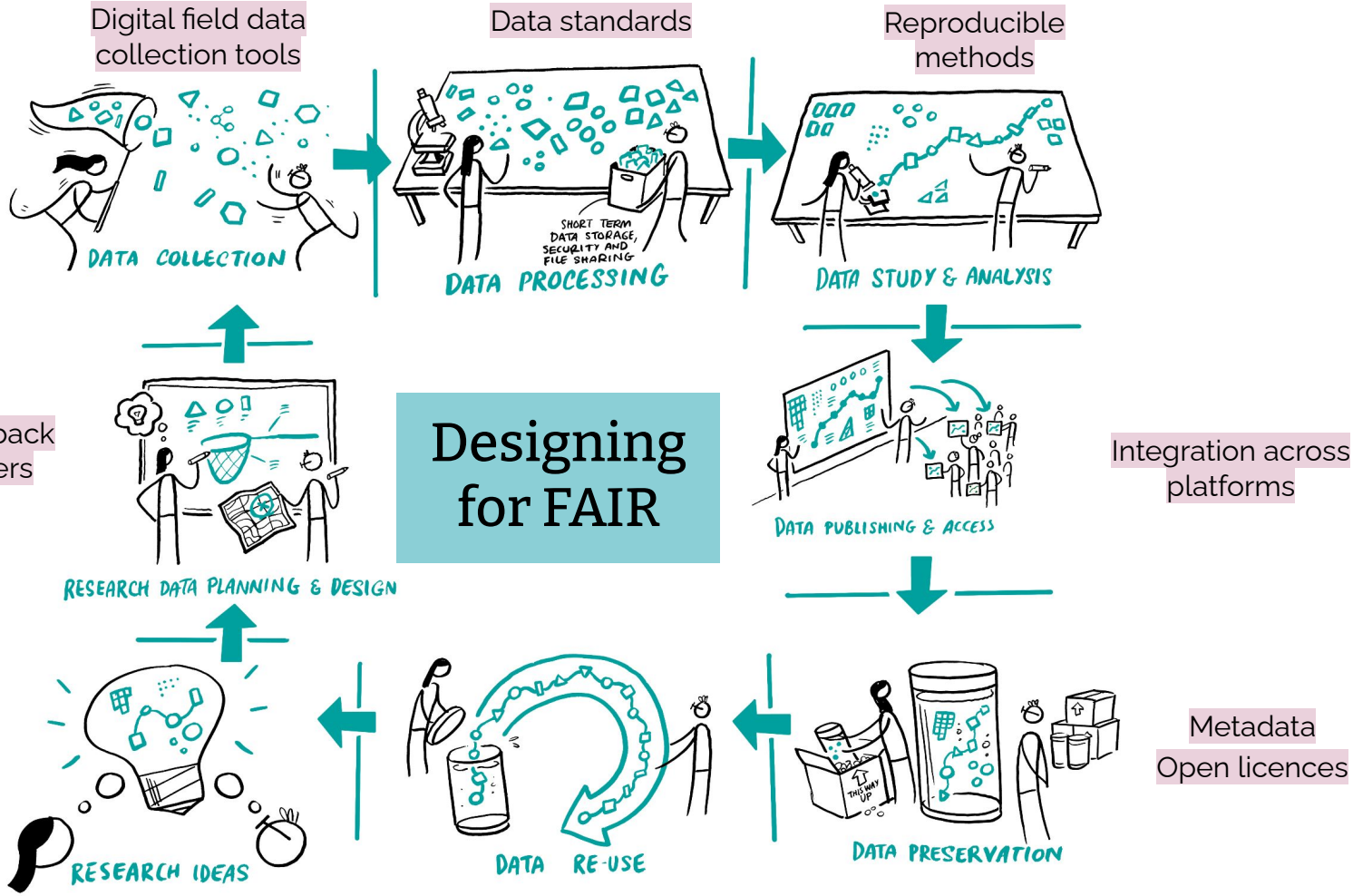
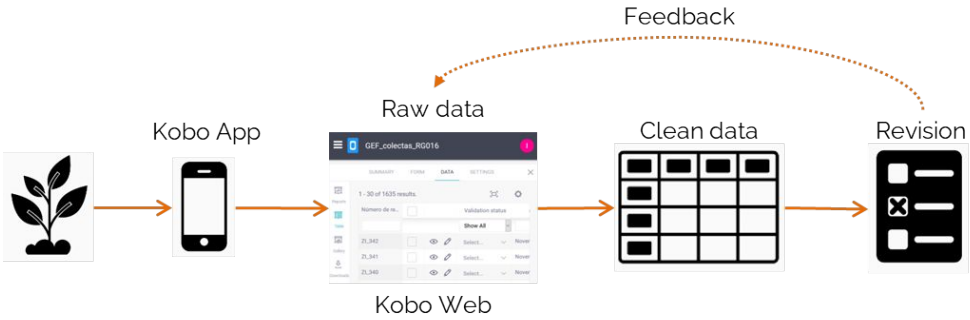
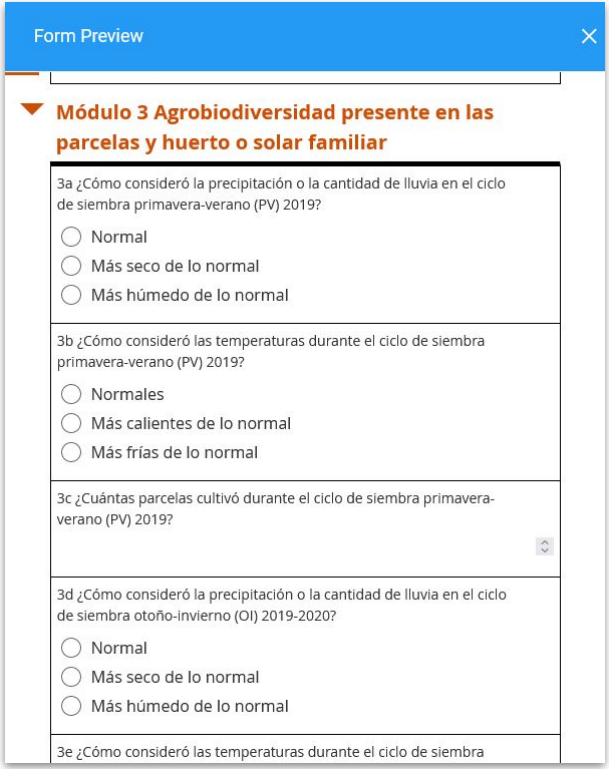


Image by Scriberia for The Turing Way

Digital field data collection

- KoBoToolbox:
  - Open source tools by the Harvard Humanitarian Initiative
  - Local server at Conabio.
  - On-/Off-line mobile app.
  - Easy backup and access.
- Surveys designed with experts.
- Reproducible workflow.





Digital surveys

Vocabularies and taxonomies

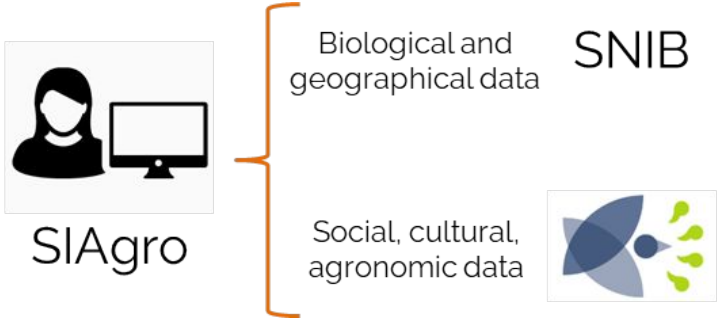
- Controlled vocabularies.
  - During collection, revision, publication.
  - For social, cultural and agronomic data.
- Diversity vs. standardization.

Taxonomy of use and management of Mexican biodiversity to develop Information Systems

Example: traditional agroecosystems

Data integration platform

- Open source code generators:
  - from user-defined data models,
  - generate GraphQL API and GUI of custom data warehouse.
- Integrate distributed data:



JÜLICH Forschungszentrum

CONABIO

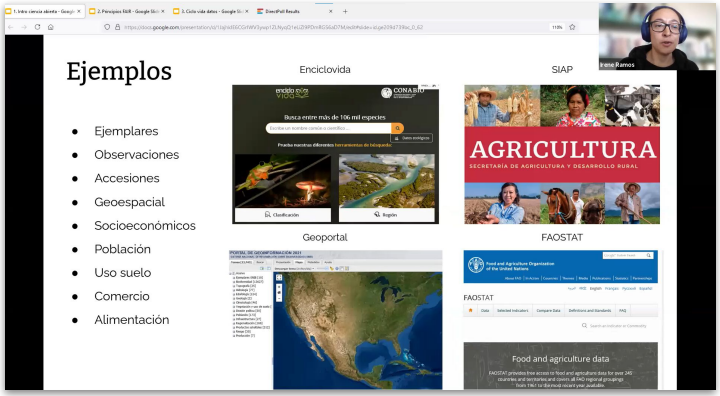
ZENDRO

https://zendro-dev.github.io/

Video: https://vimeo.com/437697628

Open data training

- Problem: Limited data reuse.
- Workshop on data literacy skills to encourage participants to **use** data.
- Topics:
  - Open Agrobiodiversity Data
  - FAIR principles
  - Data lifecycle
  - Ethical data use
  - Data standards
- Result: increased awareness of open data as a **collaborative effort**.



Three sides of SIAgro

- Technical
  - Data
  - Tools
- Community
  - Coordinate teams
  - Capacity building
- Theory
  - Standards
  - Case studies

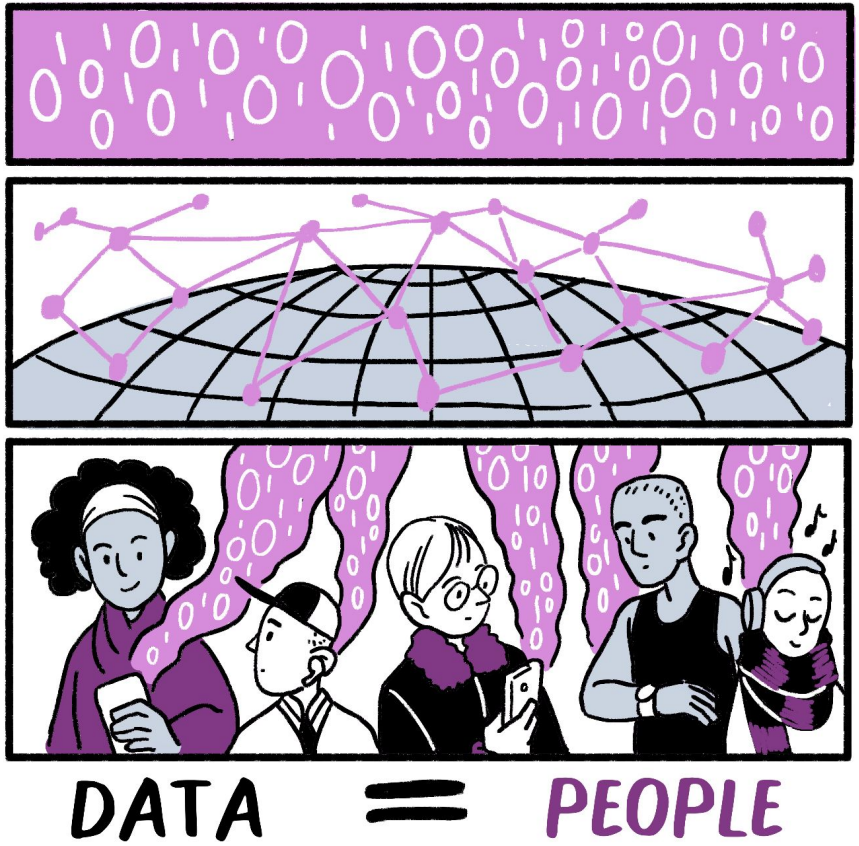


Image by Scriberia for The Turing Way

Looking forward

- Finish data collection.
- Tests with stakeholders.
- Integration with CONABIO's data portals.

Enciclovida

Photo 1 & 2 by C. Galindo

Thank you

SiAgro Team

Project lead: **Alicia Mastretta Yanes**

Data manager: **Irene Ramos**

Developers and sys. admin.: **Verónica Suaste, Francisco Ramírez, Vivian Bass**

Data analyst: **Alejandro Ponce**

Agrobiodiversity team at CONABIO

Coordinación General de Agrobiodiversidad y Recursos Biológicos

CAB area led by **Francisca Acevedo**

CRBPC area led by **Lucy Neyra**

GEF project led by **Vicente Arriaga**

Other areas at CONABIO

SNIB

Subcoordinación de Inventarios Bióticos

Coordinación de Ecoinformática

Comunicación de la Ciencia

Subcoordinación de Soporte Informático

Zendro collaborators

Forschungszentrum Jülich, Germany

Developers team led by **Asis Hallab**

Slides: doi: 10.6084/m9.figshare.16764679