



# Training in organic breeding

**Module 1: Plant Genetic Resources (PGRs): collection, conservation and exchange to support the increase of agrobiodiversity in farming systems**

## **Unit 1.3: Community seed banks – seed collection, management, exchange**

**Authors: Kostas Koutis, Riccardo Bocci, Gabriele Maneo**



Co-funded by  
the European Union

Funded by the European Union, the Swiss State Secretariat for Education, Research and Innovation (SERI) and UK Research and Innovation (UKRI).



UK Research  
and Innovation



# Module 1 – Unit 3      Community Seedbanks

## Planned for today

### Dynamic mixture of:

- Presentation about main topics on Community Seedbanks: Introduction, CSBs in Europe, Conservation and Dynamic management of PGR, Farmers' Rights (50 min)
- Mentimeter : starting questions, bottlenecks, how to continue work collectively (about 20 min)
- Debate – Homework (about 10 min)
- Conclusions & Useful links and materials (about 10 min)



# Module 1 – Unit 3 Community Seedbanks

## Some information from you

1. Type of participants –

<https://www.mentimeter.com/app/presentation/alt84p1swo5jomykc67k46dk3cqysu3j/edit?source=share-modal>

2. Are you involved in CSBs?

<https://www.mentimeter.com/app/presentation/alk23fvsa1wm3bqf94gp9qsb5vp1jndp/edit?source=share-modal>

3. What are your expectations?

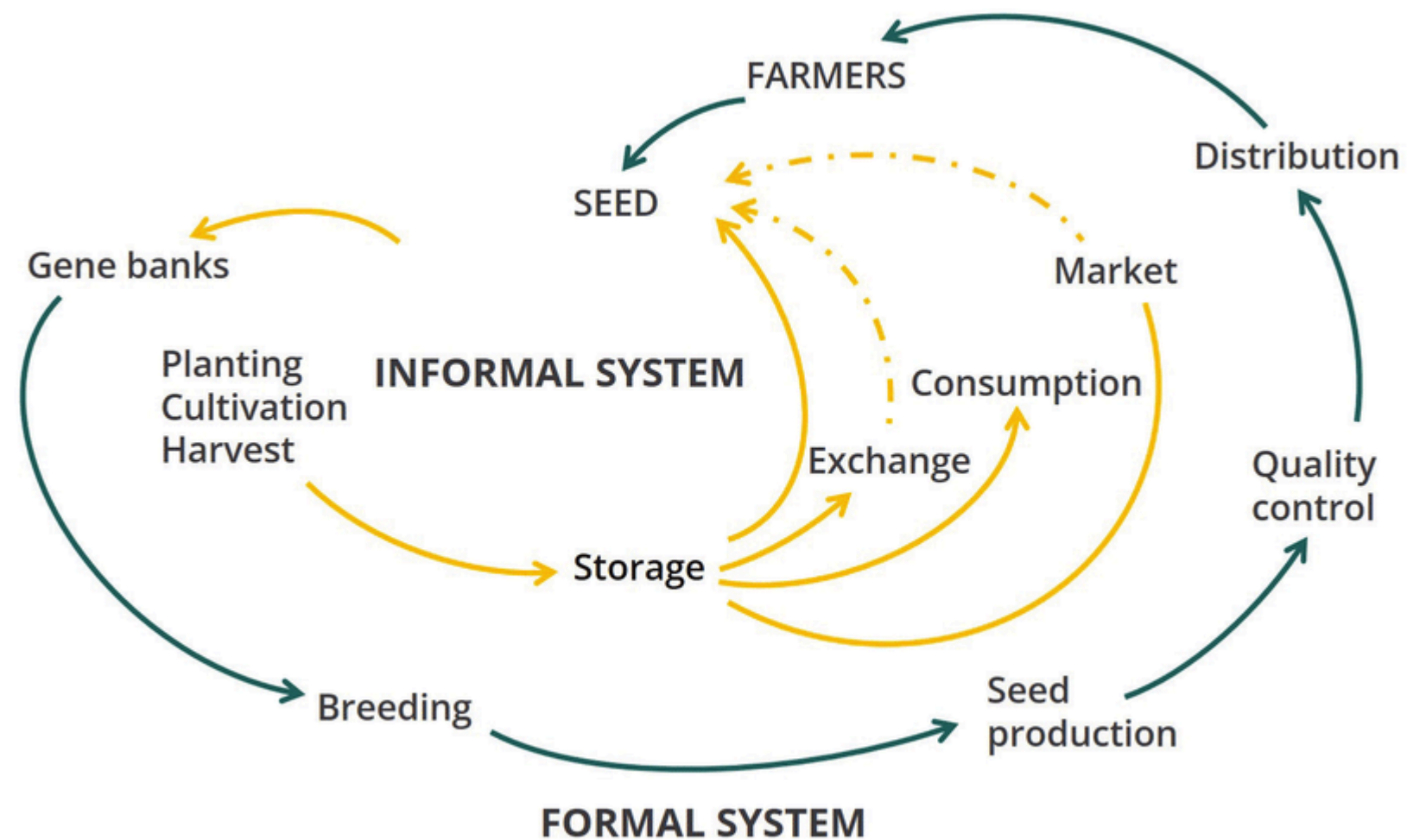
<https://www.mentimeter.com/app/presentation/alyuicuwd11ozfv7nydtia5ch163xxs1/edit?source=share-modal>



# Community Seed banks

# Introduction

- Local community mechanism/organization or seed repository with specialized functions (for collecting, storing, multiplying and disseminating seeds) like a financial bank: depositing and lending (transacting) seed similar to money.
- Usually part of the informal or semi-informal (unofficial) seed system





# Module 1 – Unit 3 Community Seedbanks

## History :

- The first community seed banks were established in the 1970s in the Global North and Australia, mainly in the form of networks of "seed-savers" or other organizational forms.
- They evolved as grassroots initiatives by networks or organizations of farmers or gardeners.
- In the South, community seed banks emerged in the late 1980s. They were established mainly with the support of international and national non-governmental organizations..
- In Europe, the Heritage Seed Library (UK) was perhaps the first to be established (1975). This was followed in the 1980s by: De Oerakker (NL), HDRA (UK), Arche Noah (AU), PSR (CH), SESAM (SE), VEN (DE)
- Since 2000, their number has been increasing rapidly in all countries





# Module 1 – Unit 3 Community Seed banks

## Operation:

- de facto seed banks (individual seed storage at the household or garden level within a community)
- exchange banks (organized seed exchanges, seed exchange festivals)
- organized seed banks (organized collection, storage and exchange of seeds of both local and modern varieties)
- seed conservation networks (organized groups for the exchange of seeds and information on traditional varieties in developed countries)
- ritual seed banks (sacred groves and religious forests with an emphasis on asexually propagated ancient trees, collectively managed according to local customs and tradition)

(Lewis and Mulvany, 1997)

***Women are very active members and in many countries are the main guardians and collectors of seeds.***





# Module 1 – Unit 3 Community Seed banks

There is great diversity in governance and management:

- grassroots level **with no formal governance** (as in Rwanda and Bolivia)
- run by a **volunteer board and managed as a participatory seed network** (as in Brazil, Honduras, Mali, Mexico, Spain, Trinidad, USA)
- governed by an **elected committee** with transparent business plans and locally developed regulatory frameworks (as in Bangladesh, Costa Rica, Nepal, Nicaragua and Zimbabwe)
- governed by an **ideology of free access, open source, seed sovereignty** (as in Canada)
- **controlled by the state/public sector** (as in China and Bhutan)
- in Europe they operate as **informal networks or as formal non-profit organizations**



Community Seed Banks are usually part of the informal, or semi-informal (unofficial) seed system, often rooted in civil society and lacking strong government policy and legal support.



# Module 1 – Unit 3 Community Seed banks



## ***COMMUNITY SEED BANKS IN EUROPE***

### ***Mapping & survey results***

2017-9-21


***Beate Koller, ARCHE NOAH***




This project has received funding from the European Union's Horizon Programme under grant agreement no 655571

[www.diversifood.eu](http://www.diversifood.eu)

# Module 1 – Unit 3 Community Seed banks








[ABOUT](#) [THE CSB MAP](#) [MATERIAL](#) [EVENTS](#) [CONTACT](#)

85 answers  
to CSB  
survey


Map of Community Seed Banks in Europe. If you want to be shown on this map with your initiative, please contact us [here](#).





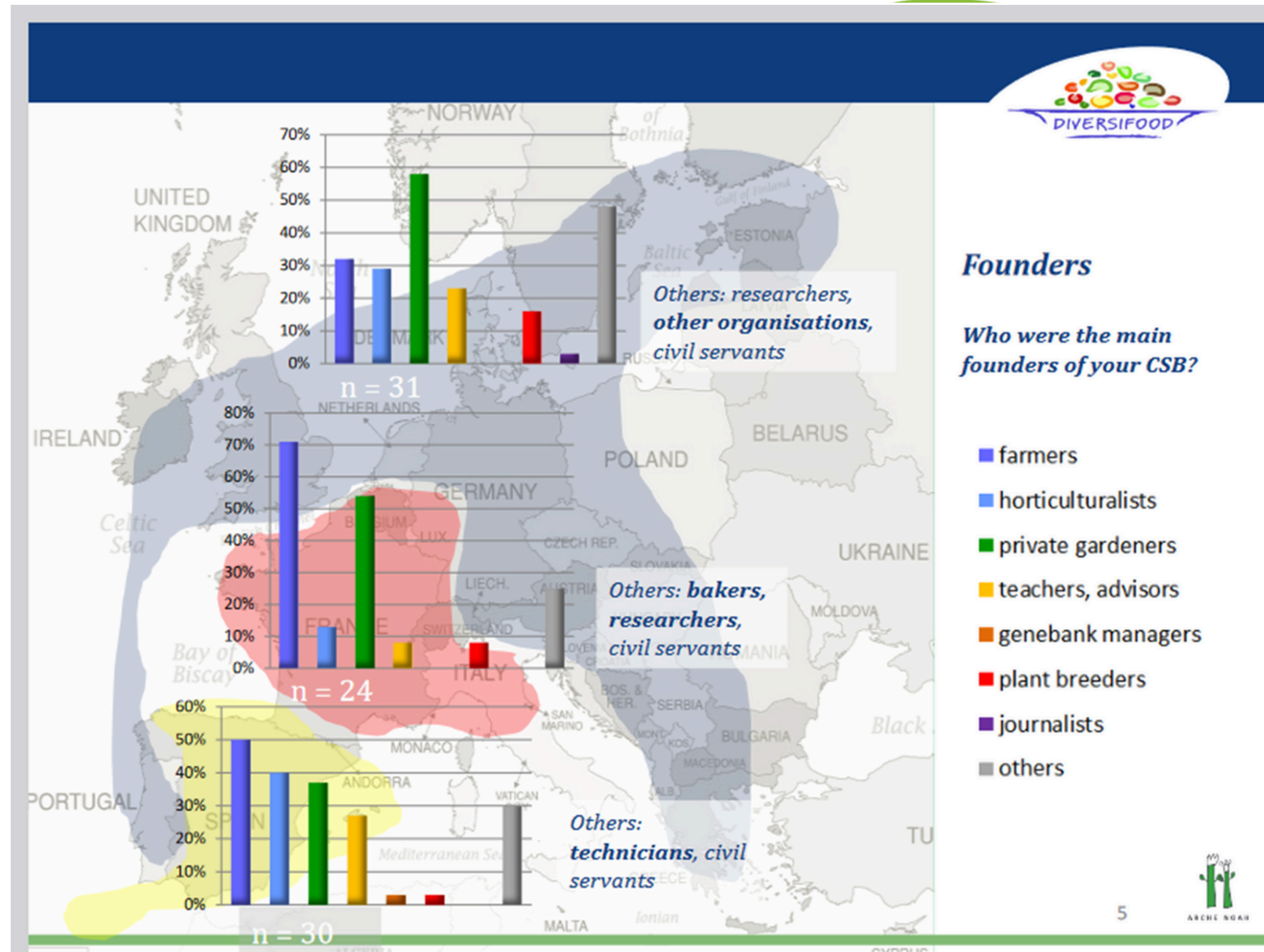
This project has received funding from the European Union's Horizon Programme under grant agreement no 612671

© 2017 - Community Seed Banks - IMPRINT

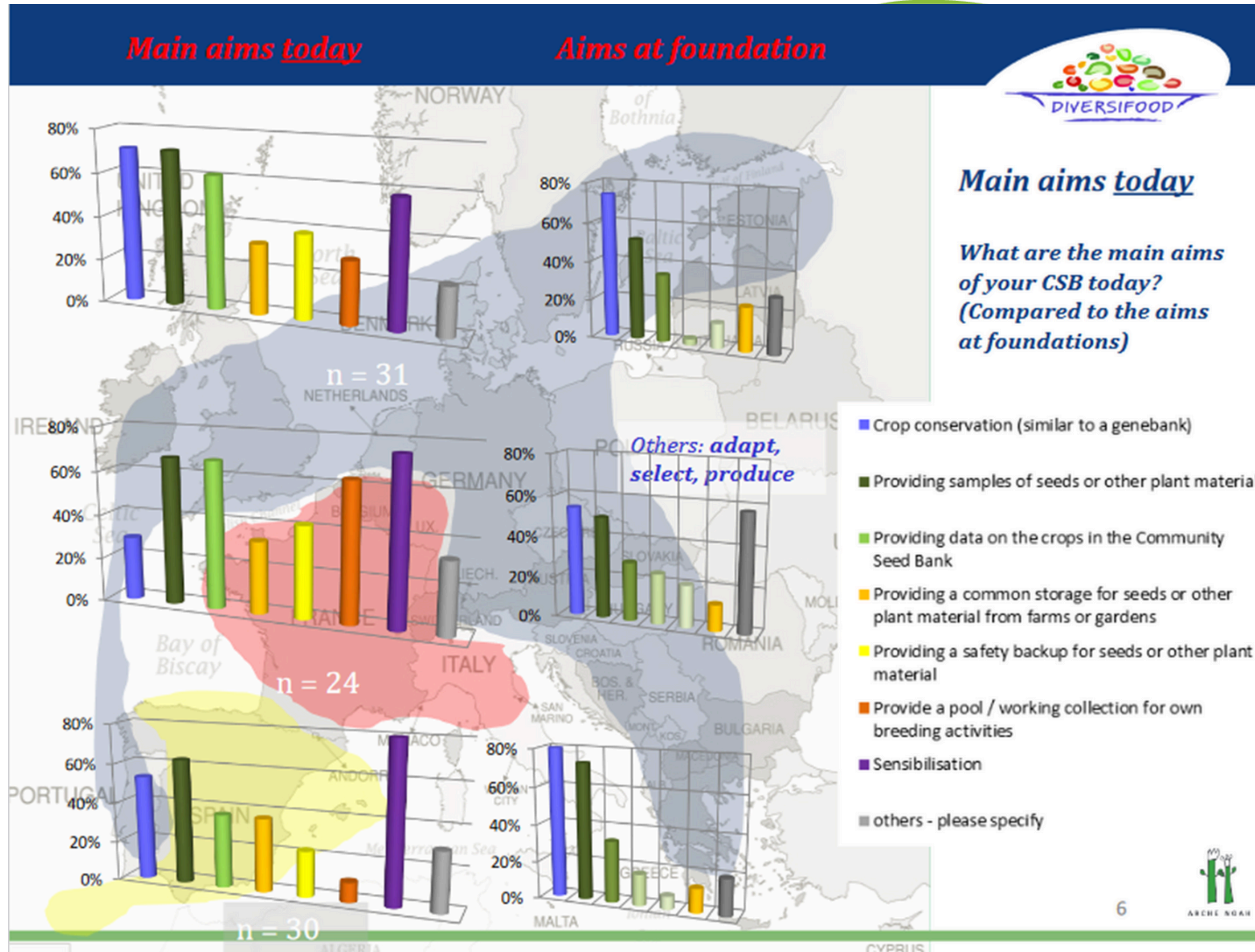




# Module 1 – Unit 3 Community Seed banks

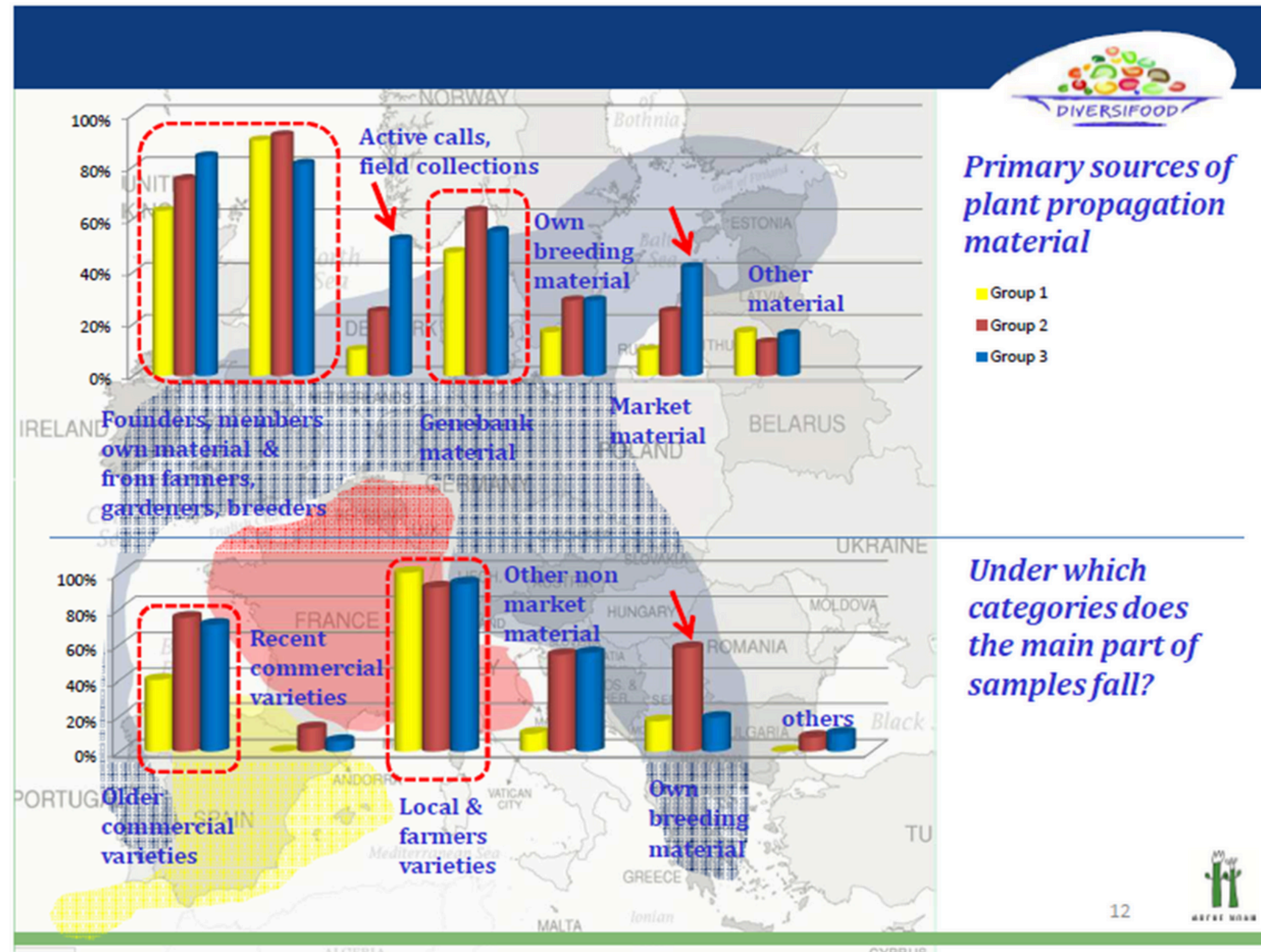


# Module 1 – Unit 3      Community Seed banks



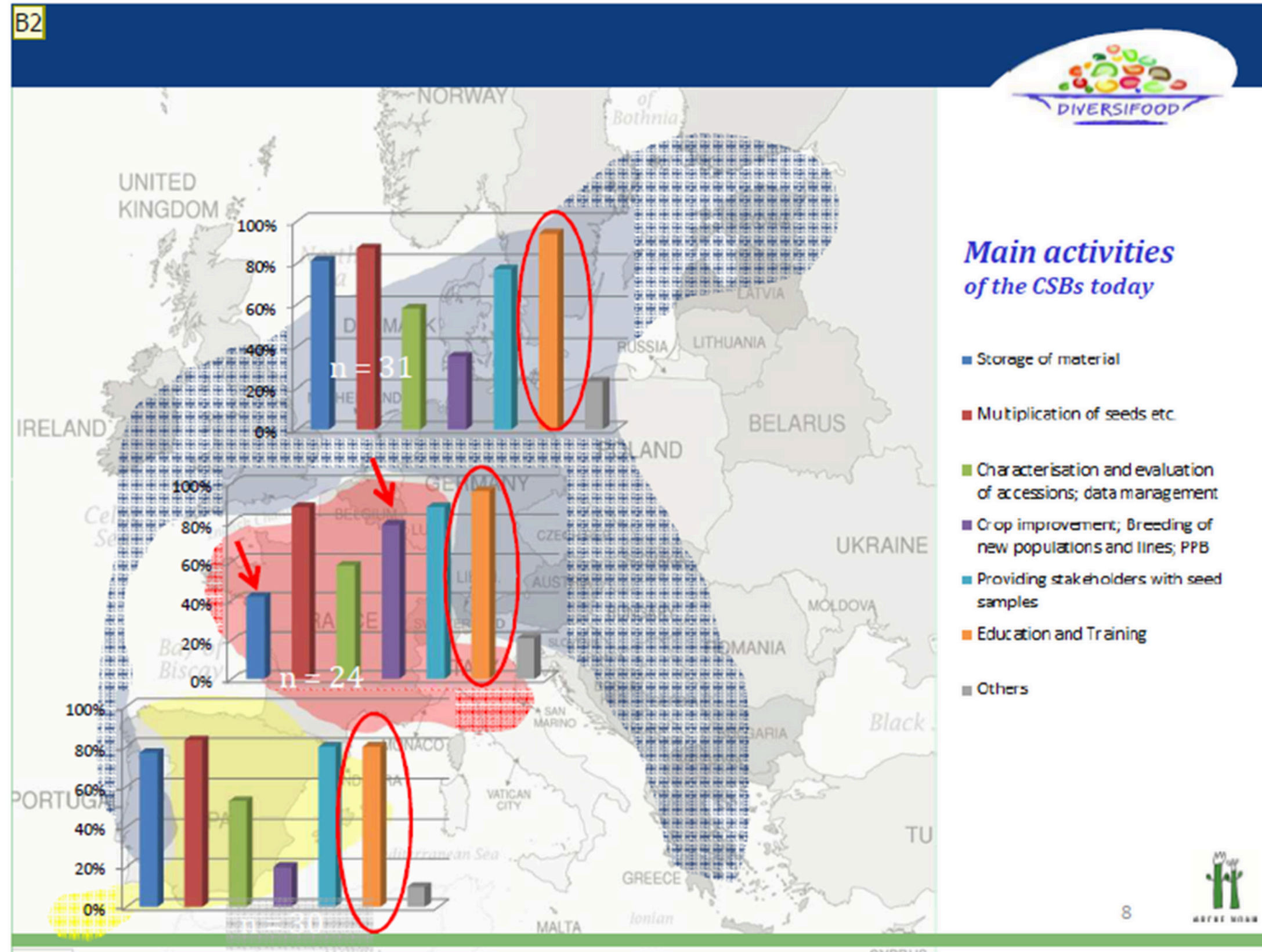


# Module 1 – Unit 3 Community Seed banks



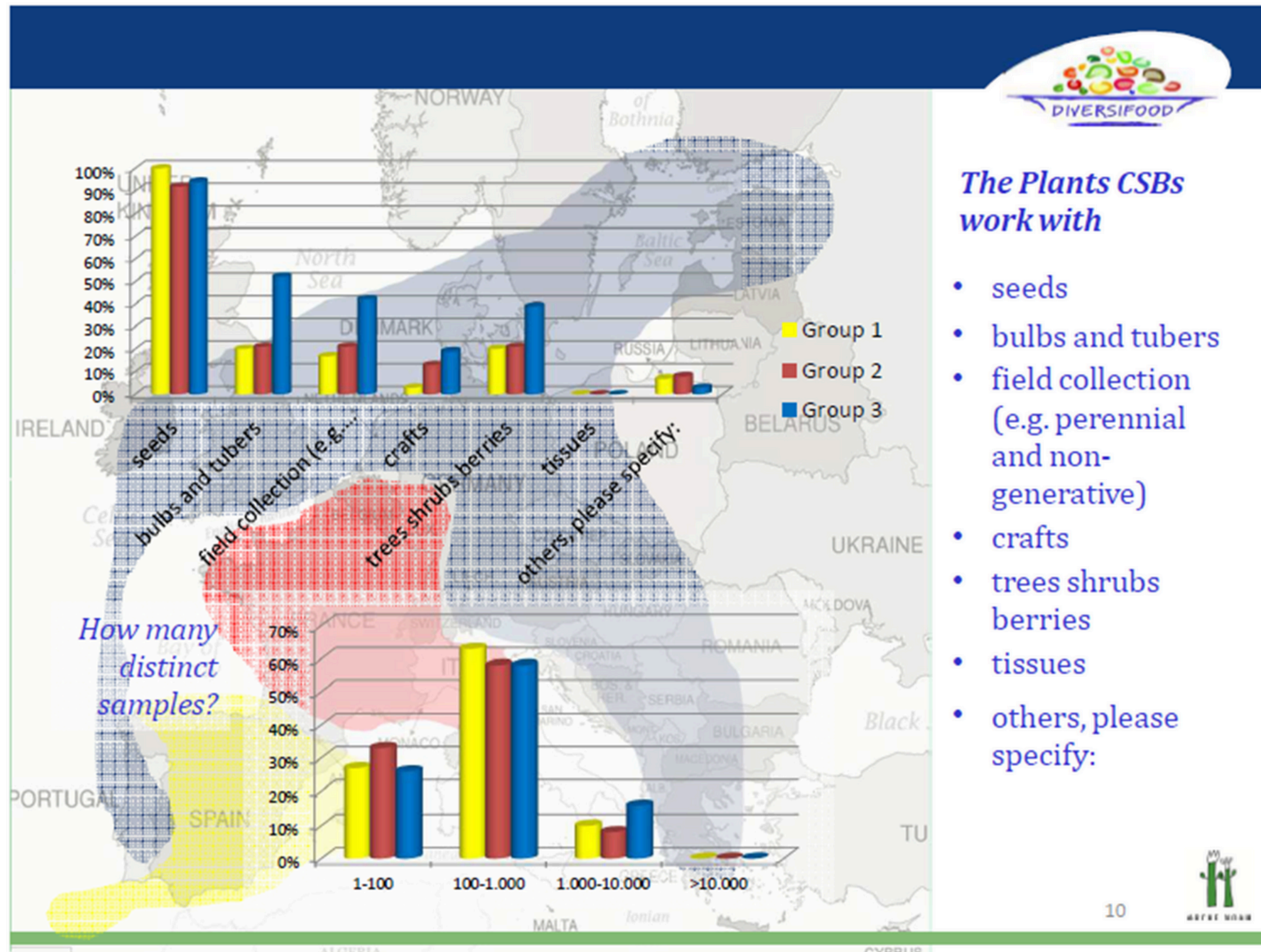


# Module 1 – Unit 3 Community Seed banks



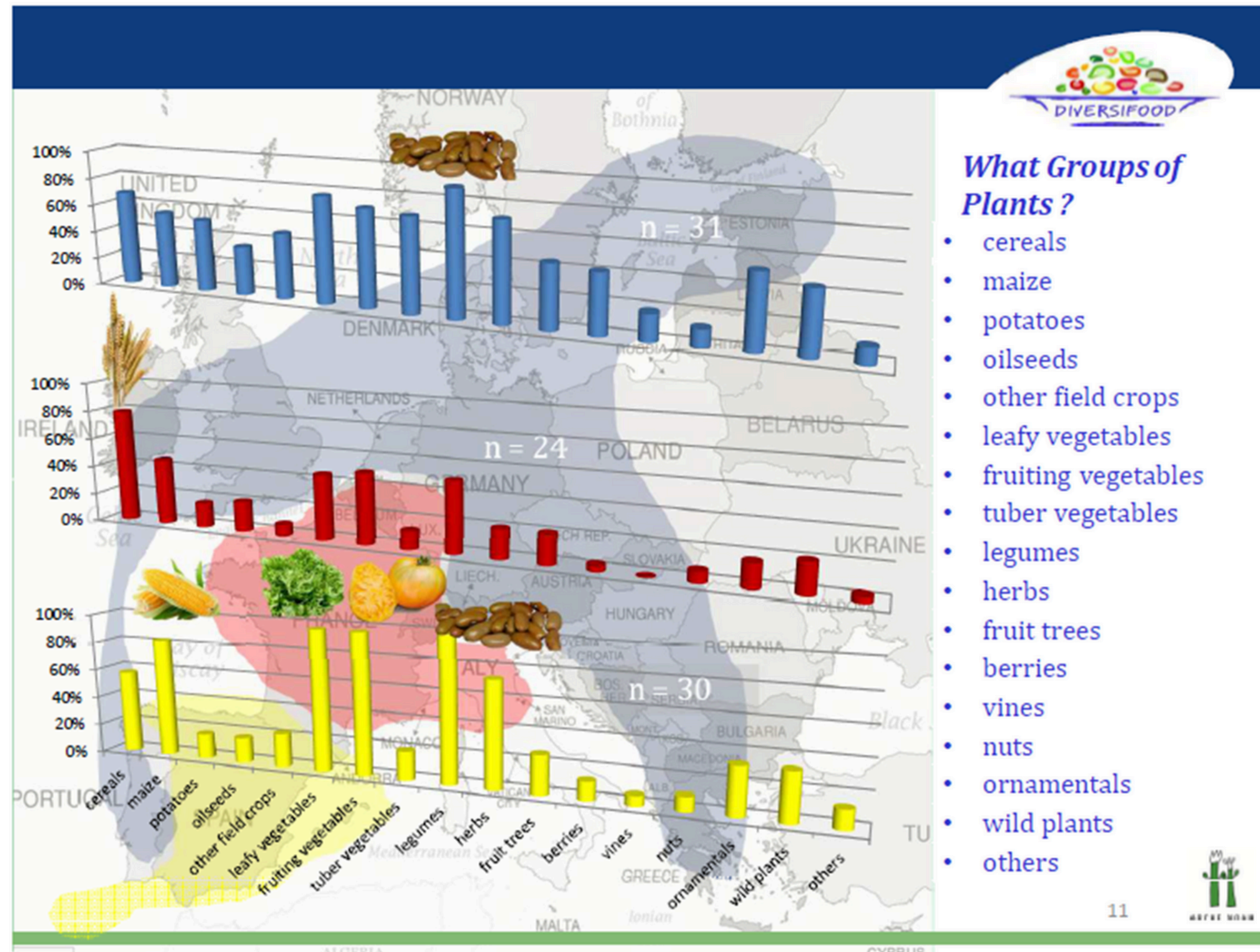


# Module 1 – Unit 3 Community Seed banks





# Module 1 – Unit 3 Community Seed banks





# Module 1 – Unit 3      Community Seed banks

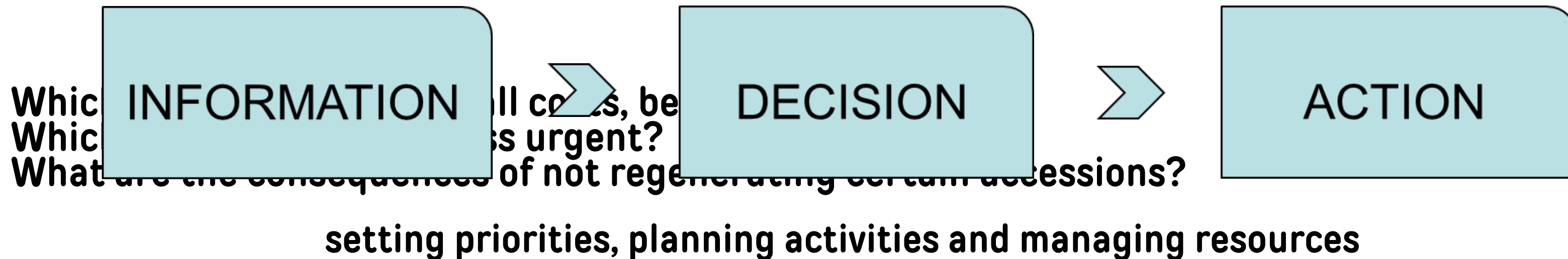
- Collection, conservation
- Data collection
- Documentation
- Dynamic management of PGR

# Module 1 – Unit 3 Community Seed banks

How necessary is the organization of collections and documentation for CSBs?

**Community Seed Banks:** collection, storage, multiplication and dissemination of seeds

**Informal Seed Systems:** actions and processes within the farming community, which aims to secure seed for the next growing season





# Module 1 – Unit 3 Community Seed banks

## Operational procedures (examples)

Sample registration (input and batch)  
seed cleaning,  
moisture content  
seed drying,  
seed viability testing,  
seed packaging  
seed storage  
seed tracking  
re-propagation,  
seed distribution

## Scientific procedures (examples)

- characterization
- evaluation
- knowledge data
- selection and breeding data





# Module 1 – Unit 3 Community Seed banks

## Data collection

Step-by-step recording of raw data with **coding and use of descriptors**

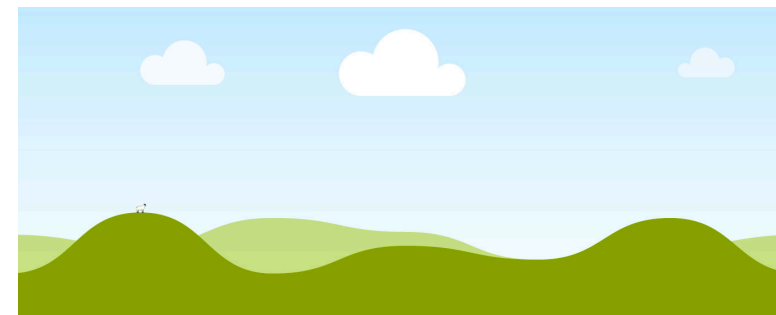
- Field or post-harvest data:
  - Location, soil and climate
  - Description (e.g. leaf shape, flower color, plant height, flowering season, harvest, etc.)
  - Behavior (e.g. disease/insect/frost resistance, fruiting, adaptability)
  - Taste, shelf life, nutrients
- Scientific name
  - Local name
  - Donor/origin
  - Germination test
  - Propagation
  - Uses, knowledge
  - Photos



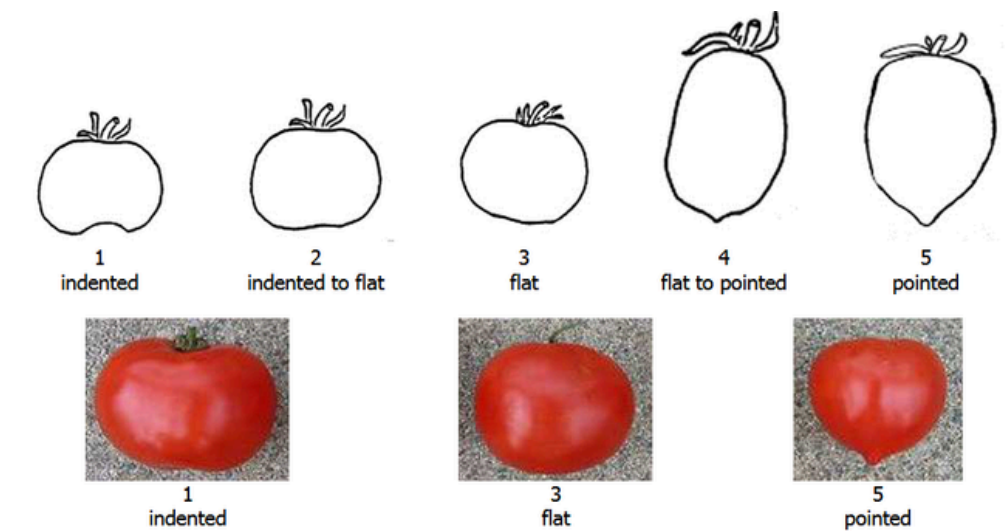
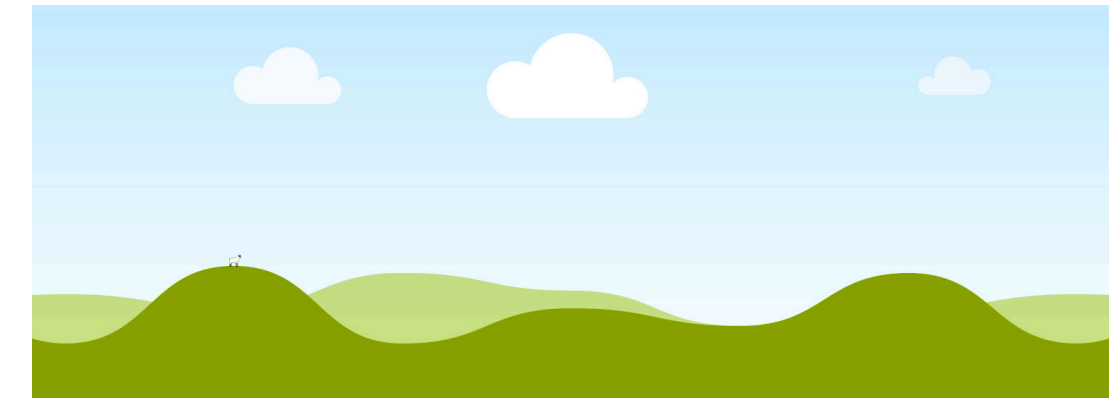


# Module 1 – Unit 3 Community Seed banks

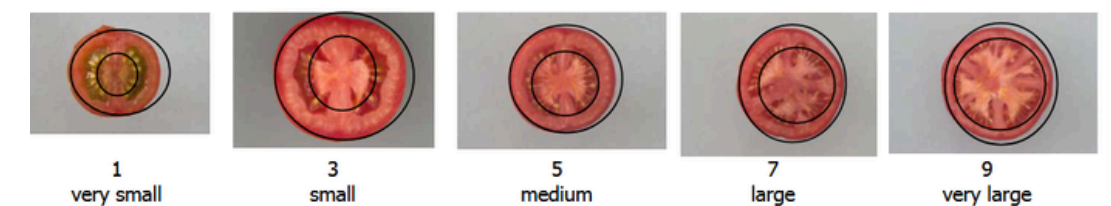
## Data collection



Description and participatory evaluation



Ad. 34: Fruit: diameter of core in cross section in relation to total diameter



# Module 1 – Unit 3      Community Seed banks

## Database – Management

Analysis – export – data and seed exchange

- Smaller or initial CSBs can or should **simply track the movement of seeds** in and out,
- Other CSBs with an extensive range of activities that are engaged in active experimentation and innovation around seeds, may perform more **complex operations on the data** they host and generate.
- **Quality and safety controls are essential** in both cases
- **All seeds entering and leaving the CSB should be recorded.**
- It is important to record the **origin of the seed**, local name, keeper, year of harvest.
- The data can be recorded **on paper or digitally**, ideally both.
- For seeds distributed outside the CSB, the use of the **Standard Seed Transfer Agreement (SMTA)** is recommended

SMTA: (<https://www.fao.org/3/be623e/be623e.pdf>)



# Module 1 – Unit 3      Community Seed banks

## Dynamic management of PGR

- Evolution of crops and diversity
- Adaptation to climate change
- Food systems security and resilience
- Local seed systems thrive
- Small farmers' survival

### **Conservation Vs Management**

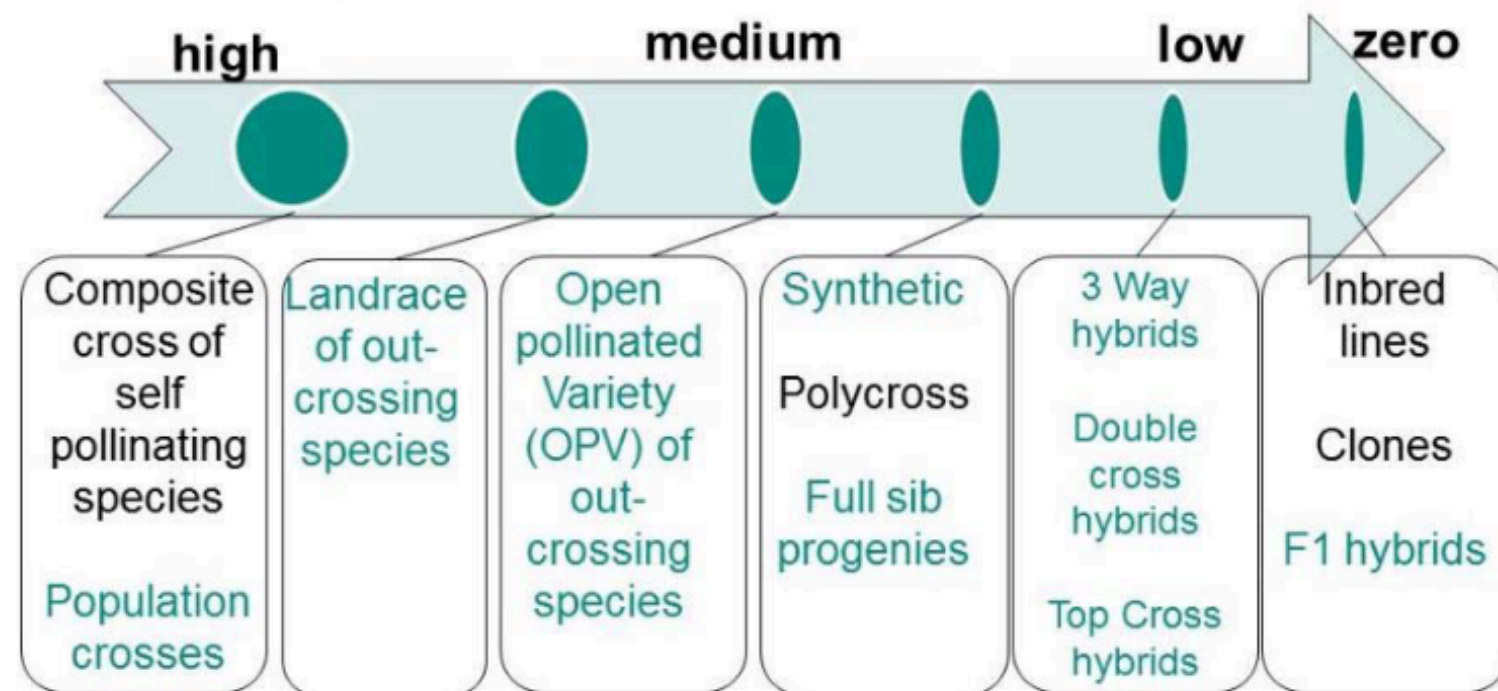
The term 'conservation' is an aim or an action that is often considered to be a **static process**, i.e. the maintenance of the genetic integrity of a given genotype or population. On the other hand, 'management' is a more **dynamic process**, which involves changes in the genetic pattern of the managed populations.

On-farm conservation and management should be considered as **complementary approaches** for maintaining and promoting on-farm systems and both should be supported.


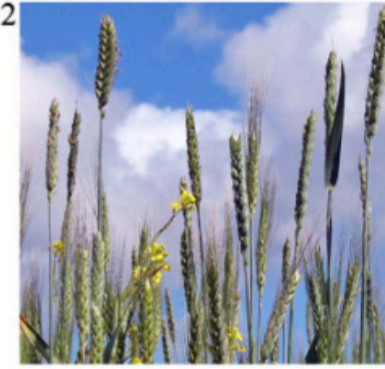

# Module 1 – Unit 3 Community Seed banks

## On farm Conservation and Crop Diversification

- **On farm conservation** is a **dynamic form of crop and animal genetic diversity management in farmers' fields**, which allows the processes of evolution under natural and human selection to continue
- **Particular breeding efforts are needed to broaden the genetic base** of cultivated crops and create varieties that meet the manifold demands in relation to quality, resilience and sustainability.



### Harnessing Diversity

Using genetic diversity in crop breeding Able et al. (2007)	Deploying genetic diversity in crop management Newton et al. (2009)	Deploying species diversity in crop management Malézieux et al. (2009)
 1	 2	 3
<p>Create cultivars able to provide given services</p> <ul style="list-style-type: none"><li>• McIntosh (1998)</li><li>• Witcombe et al. (2008)</li></ul> <p>Create cultivars adapted to organic and low-input growing conditions</p> <ul style="list-style-type: none"><li>• Dambroth and El Bassam (1983)</li><li>• Murphy et al. (2007)</li></ul>	<p>Grow mixed stands of different cultivars</p> <ul style="list-style-type: none"><li>• Finckh et al. (2000)</li><li>• Kiær et al. (2009)</li></ul> <p>Grow genetically heterogeneous cultivars through an evolutionary breeding approach</p> <ul style="list-style-type: none"><li>• Phillips and Wolfe (2005)</li><li>• Döring et al. (2011)</li></ul>	<p>Include an intercrop in wheat crop cycle</p> <ul style="list-style-type: none"><li>• Hauggaard-Nielsen et al. (2001)</li><li>• Poggio (2005)</li></ul> <p>Include a living mulch in wheat crop cycle</p> <ul style="list-style-type: none"><li>• Hiltbrunner et al. (2007a)</li><li>• Hartwig and Ammon (2002)</li></ul>

**FiBL** [www.fibl.org](http://www.fibl.org) **LIVESEED** **ECO-PB**

Costanzo & Barberi 2014 Agron. Sustain. Dev. 34:327–348



# Module 1 – Unit 3 Community Seed banks

- **Evolutionary breeding** : Crop populations with a high level of genetic diversity are subjected to the forces of natural selection ; thus, evolving crop populations have the capability of adapting to the conditions under which they are grown
- **Participatory Organic breeding**: Sustains and improves the genetic diversity of our crops, and thus contributes to the promotion of agro-biodiversity.

## Aims of Organic Plant Breeding

- › Sustainable use of genetic resources
- › Dynamic equilibrium of the whole agro-ecosystem
- › Food security & nutritional quality
- › Food sovereignty
- › Secure supply of plant products
- › Serve welfare of society
- › Improve Agro-biodiversity
- › Adaptation to climate change
- › Breeding goals match demand of complete market chain incl. customers' needs



## Level of participatory research

### › Conventional

Research managed on station or on farm trials

### › Consultative

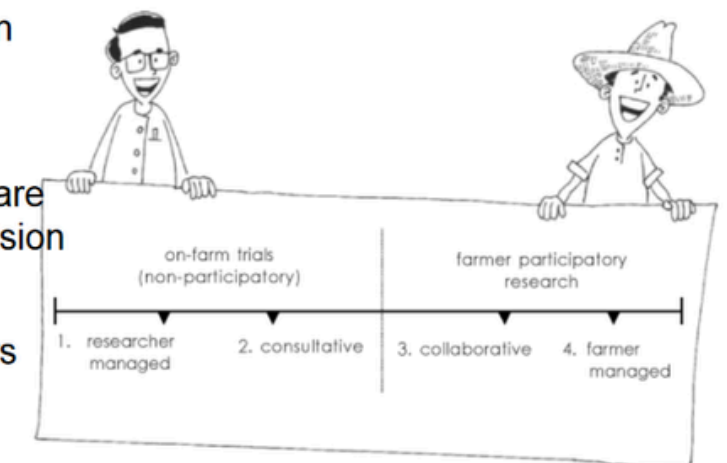
Information sharing, farmers are consulted scientists take decision

### › Collaborative

Task sharing between farmers and scientists

### › Farmer managed

no scientists involved



Gonsolves et al. 2005

→ **Collegial: collective decision in group process, sharing responsibility and accountability**

# Module 1 – Unit 3 Community Seed banks

## Community based breeding of locally adapted Durum wheat

coordinated by Dominique Desclaux INRA Montpellier

**Goal: locally adapted varieties for local products, supporting diversity, strengthening of rural regions**

- › Comprehension of **farmers, breeders, merchant, consumer, sociologists** ( supports exchange of industry & farmers, consciousness of consumers) → leading to new breeding criteria
  - › Respecting local conditions (soil, climate, management) → decentralized test **on farm**
  - › Farmers are involved in decision processes (not only end user of varieties but included in development stage)
  - › Marketing aspects are included from the start
- **collegial process**

[www.selection.participative.cirad.fr](http://www.selection.participative.cirad.fr)



# Module 1 – Unit 3    Community Seed banks

Which bottlenecks do you see  
related to CBSs development in  
Europe?

<https://www.mentimeter.com/app/presentation/alh91wrrsjgibwqbgoansyiwtzk1oi14/edit?source=share-modal>

# Module 1 – Unit 3 Community Seed banks

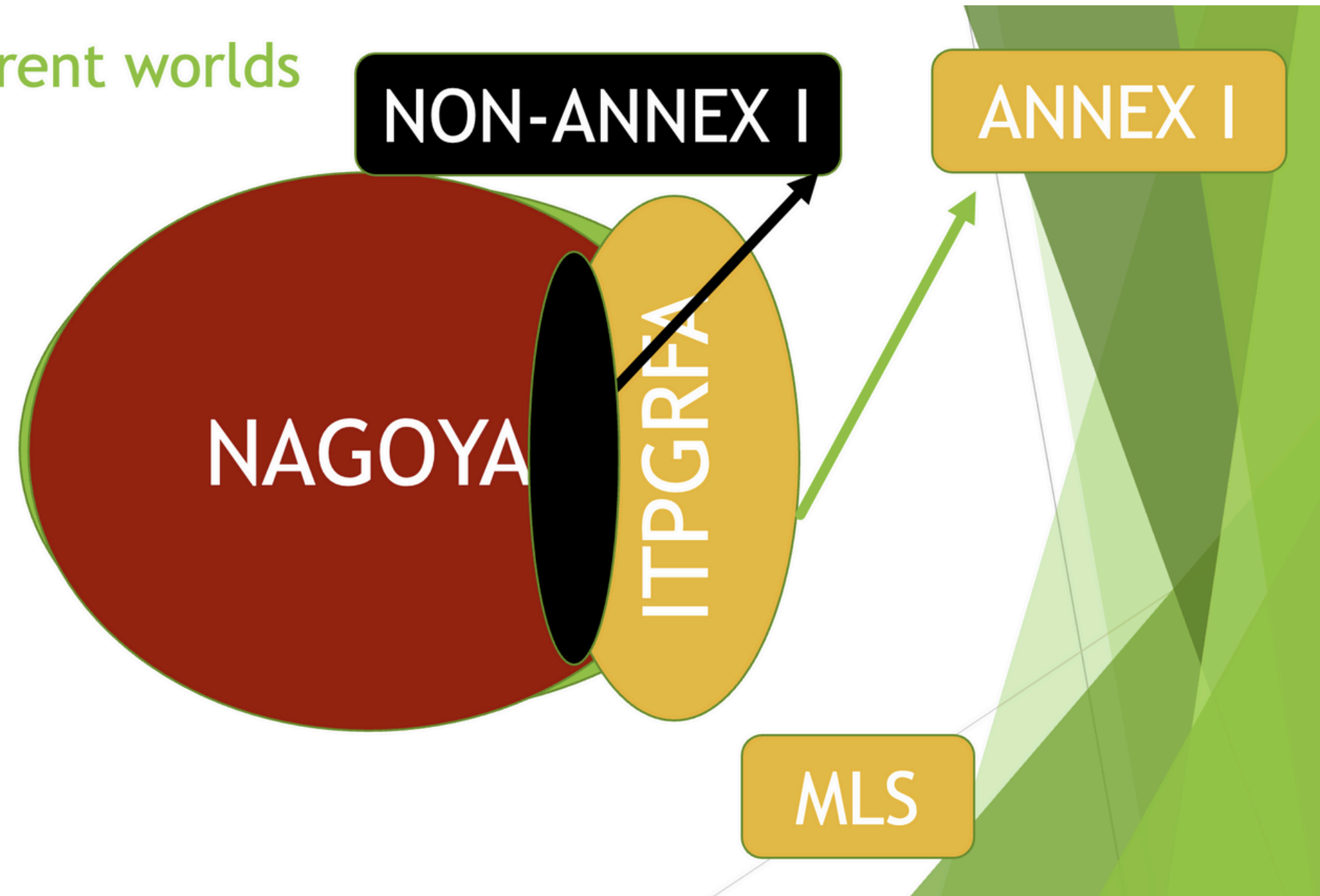
How to manage collecting and giving varieties?



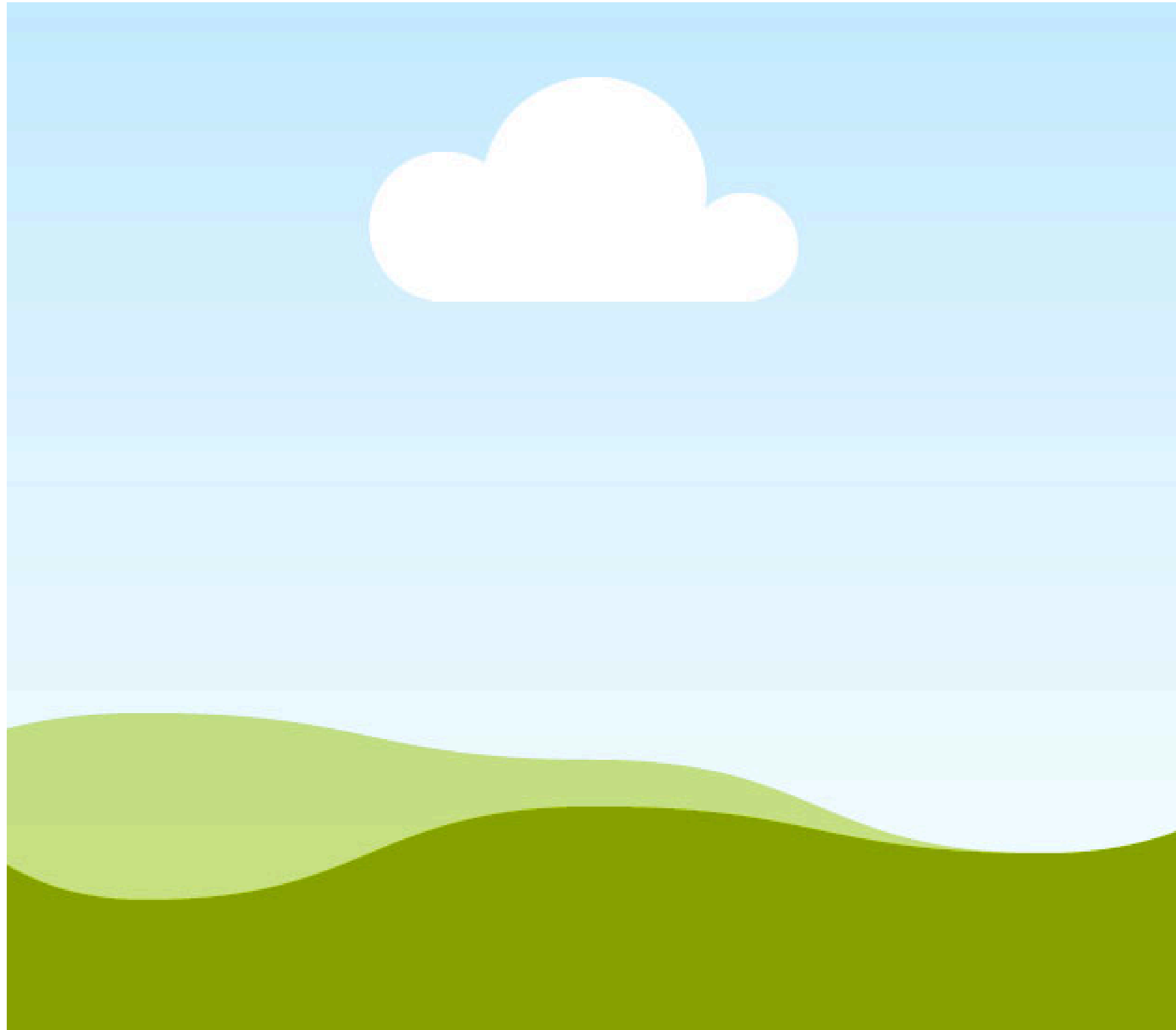


# Module 1 – Unit 3 Community Seed banks

Two different worlds

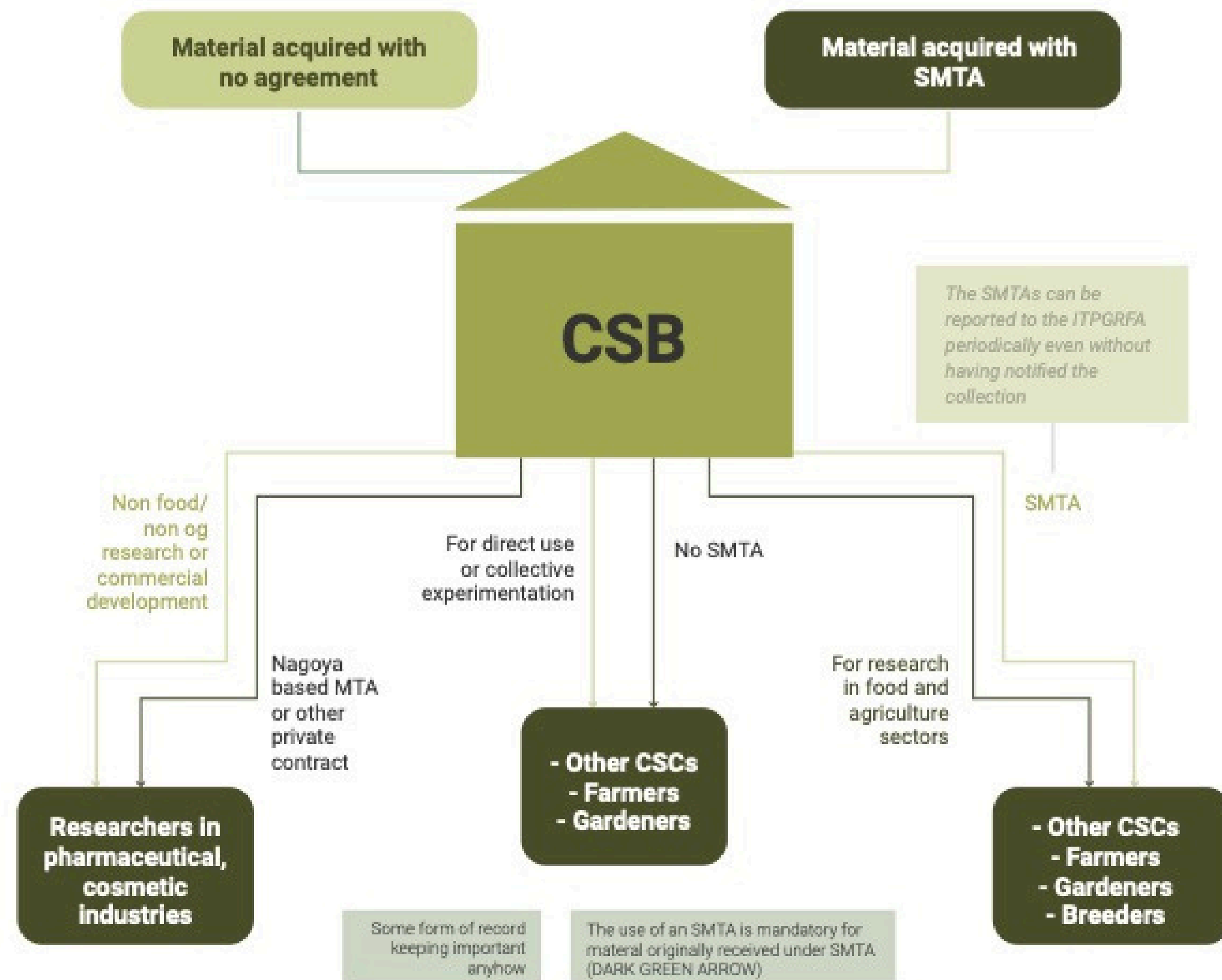


# Module 1 – Unit 3    Community Seed banks





# Module 1 – Unit 3 Community Seed banks



# Module 1 – Unit 3      Community Seed banks

CSBs have to define:

How they manage access to PGRFA from farmers;

How they give seeds away to:

- Farmers or direct use
- Scientists or research
- Other actors or uses



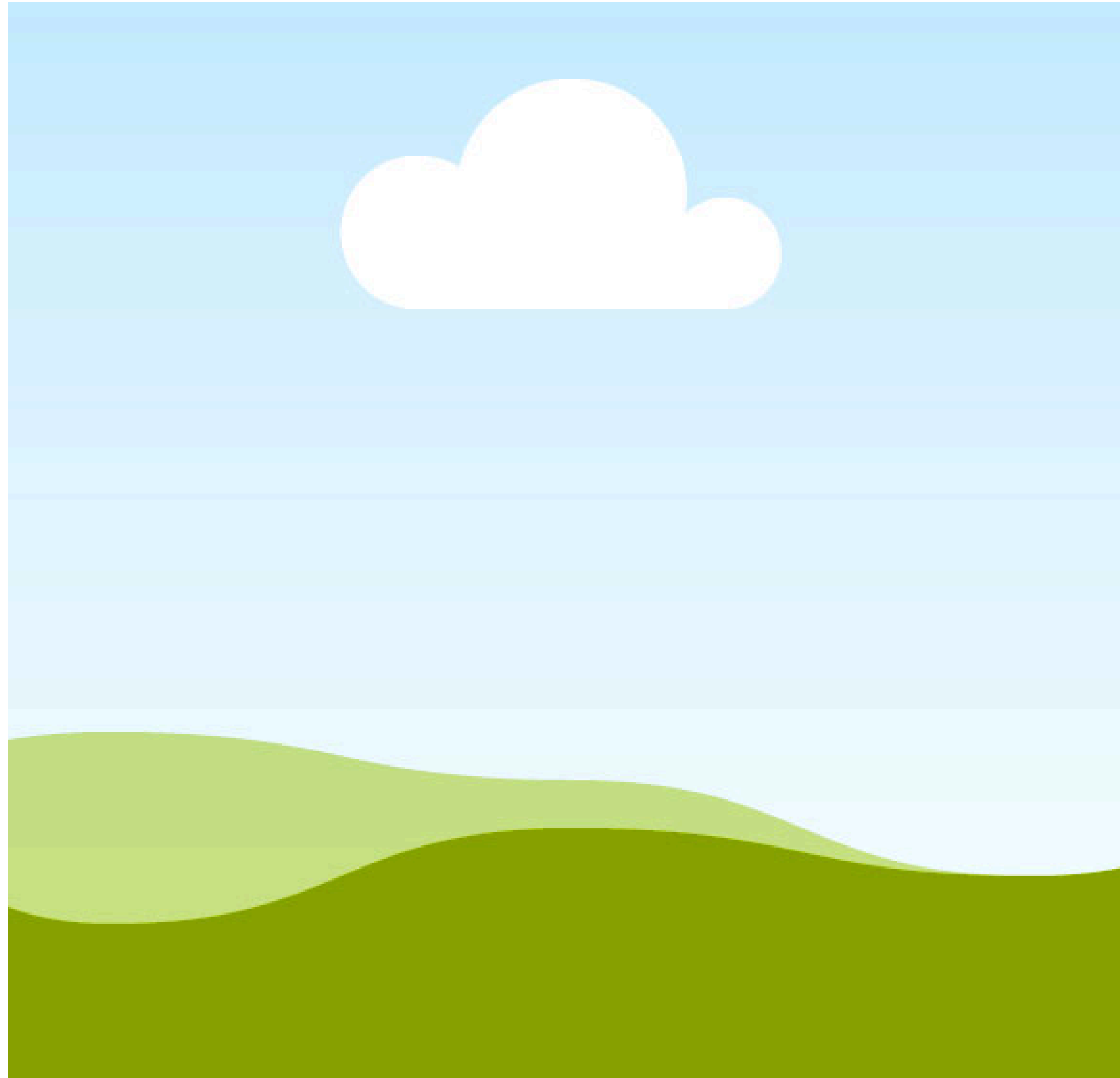


# Module 1 – Unit 3 Community Seed banks

## Community Seed Banks, Farmers' Rights and Sustainable Use within the Treaty



# Module 1 – Unit 3    Community Seed banks





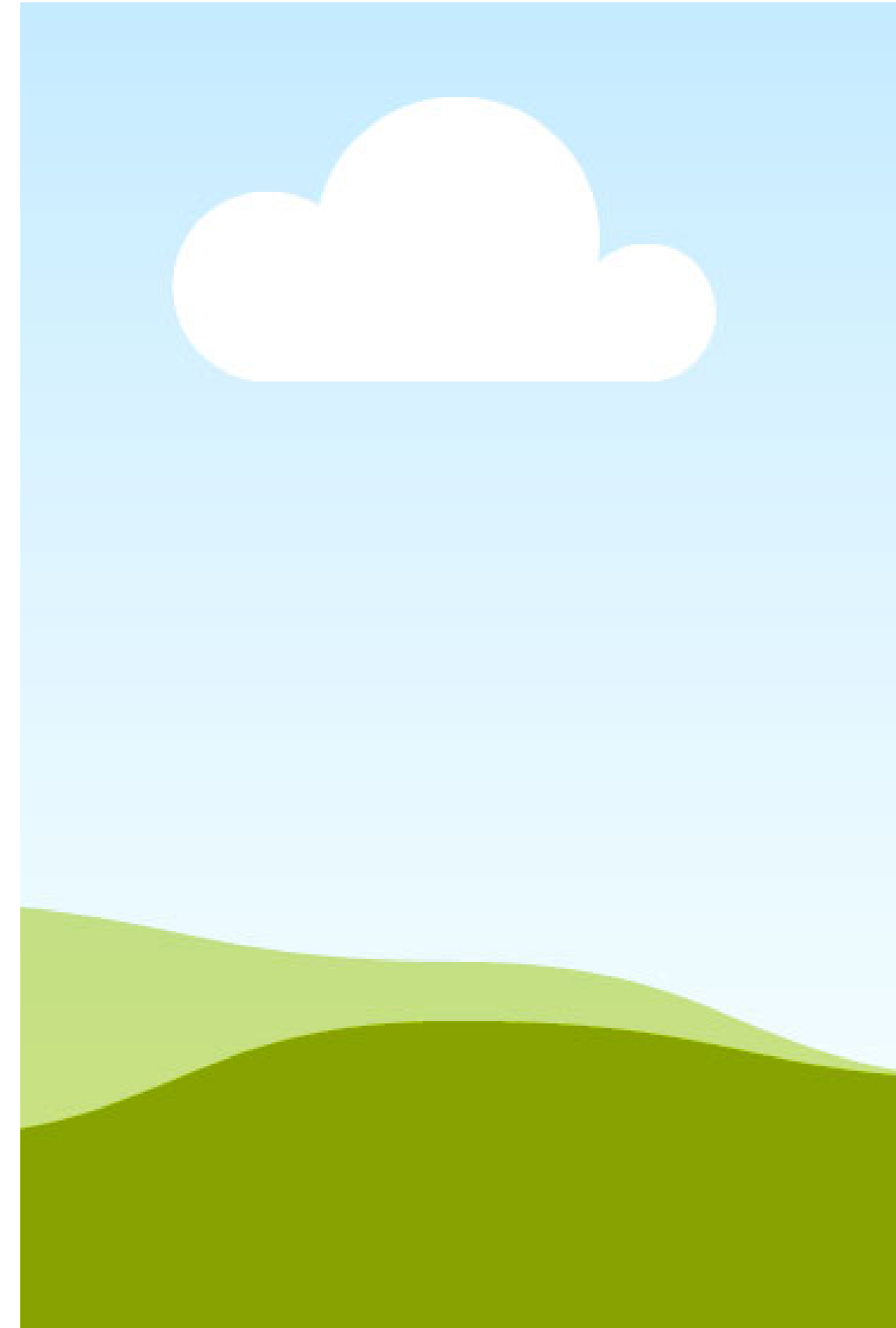
# Module 1 – Unit 3      Community Seed banks



Ad Hoc Technical Expert Group on Farmers' Rights

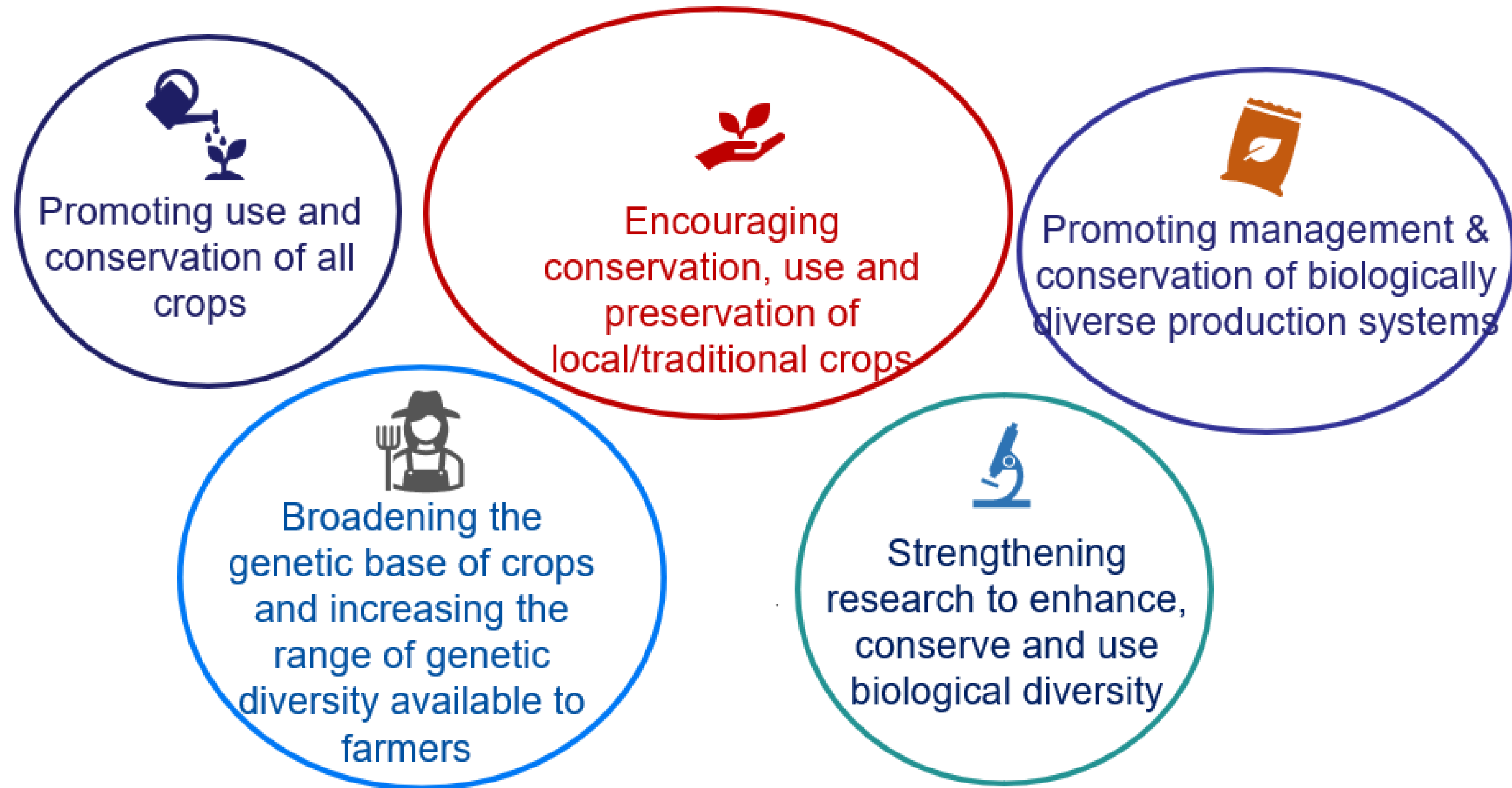
Global Symposium on Farmers' Rights – Sept. 2025

<https://www.fao.org/plant-treaty/areas-of-work/farmers-rights/en/>



# Module 1 – Unit 3 Community Seed banks

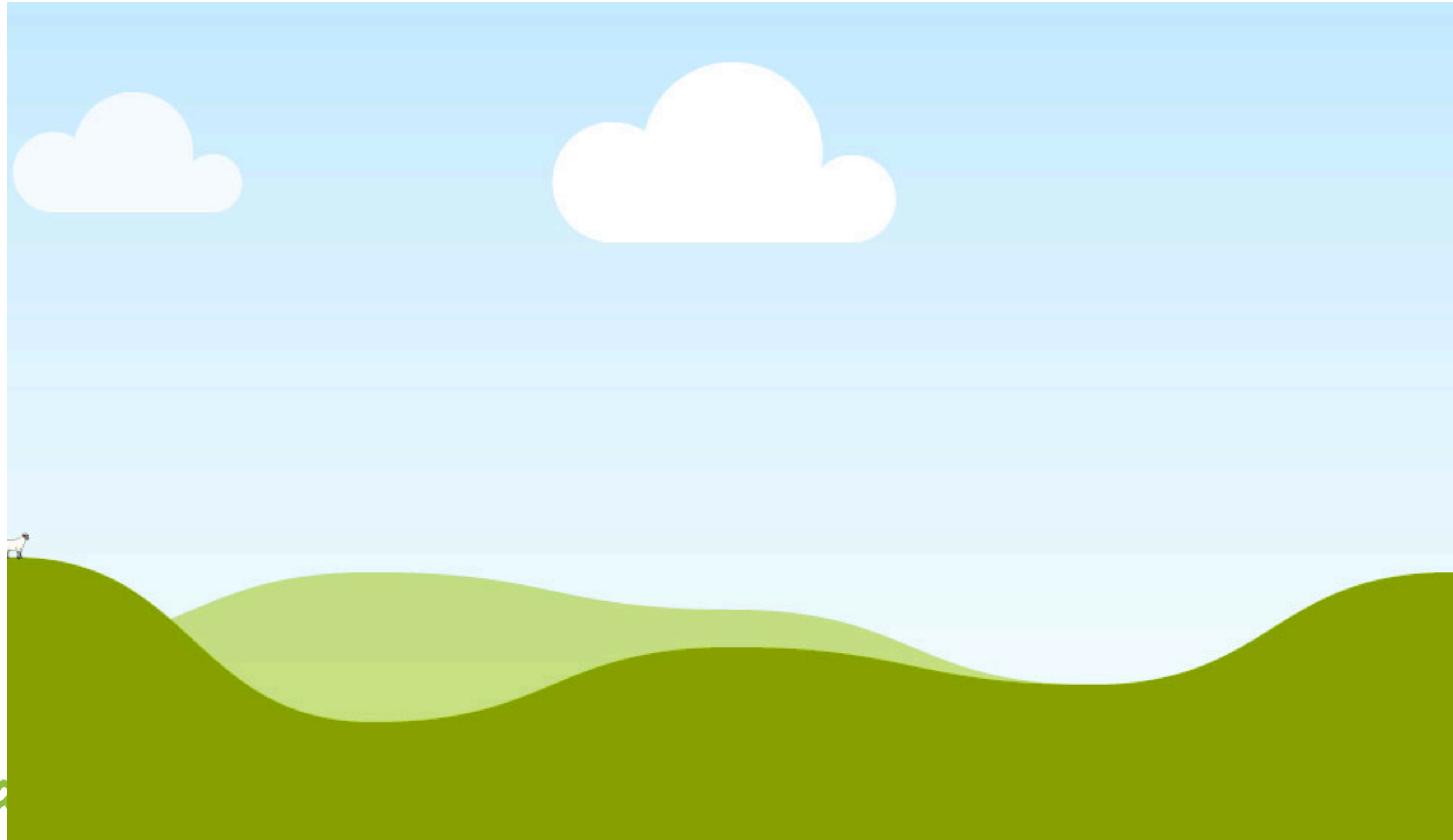
## Conservation and Sustainable use of PGRFA





# Module 1 – Unit 3 Community Seed banks

The Ad Hoc Technical Committee on Conservation and Sustainable Use





# Module 1 – Unit 3 Community Seed banks

Where are we going?





# Module 1 – Unit 3 Community Seed banks

## Our Challenges in Europe...

### Non monetary measures of BS

- ▶ on farm conservation and management
- ▶ PPB
- ▶ Facilitated access to PGRFA
- ▶ Farmers' participation
- ▶ training for CSBs

sustainable use

art. 6

conservation

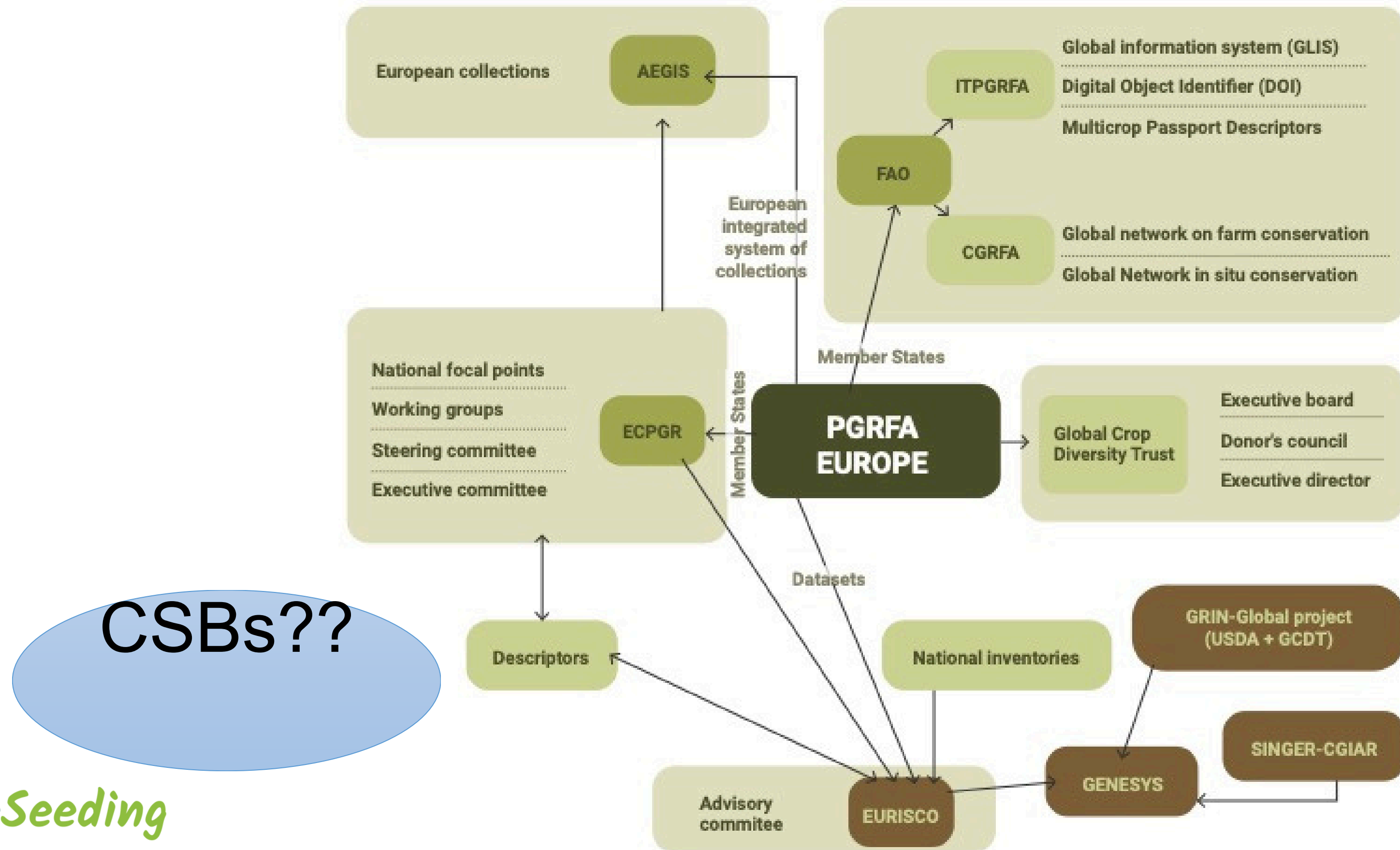
art. 5

farmers' rights

art. 9

climate changes

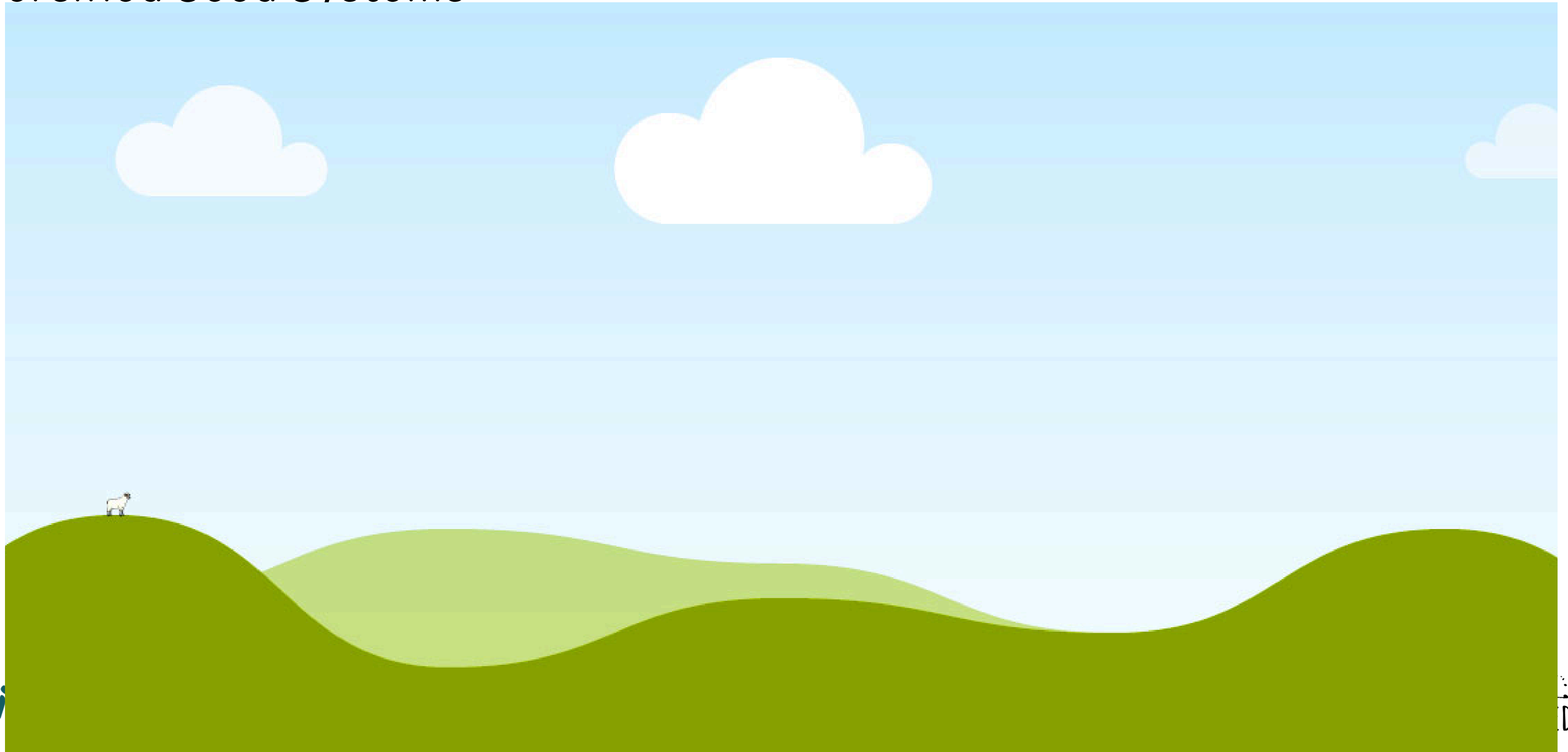
# Module 1 – Unit 3 Community Seed banks





# Module 1 – Unit 3    Community Seed banks

## Diversified Seed Systems



# Module 1 – Unit 3 Community Seed banks





# Module 1 – Unit 3      Community Seed banks

## Conclusions

1. Community Seed Banks (CSBs) **provide direct access to locally adapted varieties and farmers' seeds/selections**. This would help build the resilience of food systems to address the vulnerability caused by climate change and globalized market pressures.
2. **On farm conservation and dynamic management of PGR** are complementary approaches linked with CSBs for maintaining and promoting development and evolution of agrobiodiversity.
3. **Participatory organic and evolutionary breeding** efforts can **broaden genetic base** and help sustainable use of PGR

# Module 1 – Unit 3      Community Seed banks

## Conclusions

4. **The role of informal farmers' seed systems**, of which community seed banks are a part, needs to be further **recognized and strengthened**. To achieve this, they need an appropriate and enabling political and legal environment.
5. The CSBs, as an institution based on social-community management of agricultural biodiversity, can ensure the effective **implementation of farmers' rights** (in terms of recognition, participation in decision-making, benefit-sharing and the development of supportive policy and favourable regulatory legislative frameworks for seeds).



# Module 1 – Unit 3 Community Seed banks

## Debate– Homework

- *Can I see differences between SBs and CSBs? (also as homework)*
- *How CSBs can be significantly improved and made sustainable? (also as homework)*
- *What I know about CSBs close to me? (also as homework)*
- *Own previous experiences (also as homework)*
- *Other questions and doubts (questions can be in chat)*

Emails for homework : [koutisresfarm@gmail.com](mailto:koutisresfarm@gmail.com) and [petra.jelincic@ips-konzalting.hr](mailto:petra.jelincic@ips-konzalting.hr)

# Module 1 – Unit 3    Community Seed banks

How to continue to work collectively on CSBs?

<https://www.mentimeter.com/app/presentation/alazztqddorggm gad43zg1q2k qwg sxz9/edit?source=share-modal>



# Module 1 – Unit 3 Community Seed banks



# Module 1 – Unit 3 Community Seed banks

## Useful links and materials

Technical Manual series on Community Seed Banks DINAVERSITY project <https://liberatediversity.org/>

### DYNAVERSITY Project

#### Technical Manual series on Community Seed Banks

A series of three manuals realized by the *European Coordination Let's Liberate Diversity*, Dynaversity partner, to explain the role of Community Seed Banks.





# Module 1 – Unit 3 Community Seed banks

Useful links  
and materials





# Module 1 – Unit 3 Community Seed banks

## Useful links and materials

- <https://liberatediversity.org/the-network/>
- <https://diversifood.eu/community-seed-banks-in-europe/>
- <https://www.fao.org/treaties/en/>
- <https://www.farmersrights.org/>
- <https://foodtank.com/news/2020/07/26-organizations-working-to-serve-seed-biodiversity/>
- <https://www.communityseednetwork.org/>
- <https://www.facebook.com/balkanseednetwork/>
- <https://www.innobreed.eu/>



# LiveSeeding



Funded by the European Union, the Swiss State Secretariat for Education, Research and Innovation (SERI) and UK Research and Innovation (UKRI). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or REA, nor SERI or UKRI.



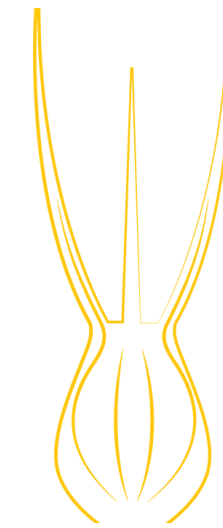
<https://liberatediversity.org/projects-old/diverseseedpaths/>



DIVERSEEDPATHS

# Seeds and Migrants

Cultivating diversity for resilient and inclusive communities



**AEGILOPS**

Greek Network for Biodiversity  
and Ecology in Agriculture



Co-funded by the  
Erasmus+ Programme  
of the European Union



*„Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.“*



# Module 1 – Unit 3 Community Seed banks







*LiveSeeding*

