DYNAVERSITY

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D1.1

List of concepts

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X CO: Confidential, only for members of the consortium (including the Commission Services)

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Abstract

Conservation and sustainable use of Plant Genetic Resources for Food and Agriculture (PGRFA) is an arena populated by different actors, institutions, and organisations, each of which use different language and concepts to describe their work, or use similar terminology in different ways. One goal of WP1 is to create "an updated definition of the concepts regarding *ex situ, in situ* and on farm conservation based on the history of their development during the past decades to provide a common knowledge base for new partnerships and tools to enhance European capacities for *in situ* conservation (including on farm and in garden conservation activities)."

This deliverable provides the DYNAVERSITY list of concepts that are important for understanding these histories, context, and debates over the conservation of plant genetic resources for food and agriculture.

This document follows the template provided by the European Commission in the Participant Portal.

This deliverable is based on and complying with the following reference documents:

- The GA, Annex I and Annex II (downloadable from the participant portal); and
- The Consortium Agreement (CA).

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Please see Glossary.

Introduction

This document, *D1.1 – List of Concepts* - is a deliverable of the DYNAVERSITY project, which is funded by the European Union's Horizon 2020 Programme under Grant Agreement #773814.

DYNAVERSITY aims to increase capacities for in-situ conservation of plant genetic resources by mapping and bringing together all stakeholders involved in the dynamic management of plant genetic resources. The project intends to facilitate the relationship between actors and develop new management and bottom-up governance models, establish new forms of seed networking and exchange and promote socio-environmental practices.

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One goal of WP1 is to create "an updated definition of the concepts regarding *ex situ, in situ* and on farm conservation based on the history of their development during the past decades to provide a common knowledge base for new partnerships and tools to enhance European capacities for *in situ* conservation (including on farm and in garden conservation activities)."

The concepts included were selected based on initial discussion with all project partners at the first annual meeting, in-depth discussions with partners involved in WP1 and WP 2, and a survey distributed to all project partners and SKEP members to help us select the most important concepts to include in this concept mapping deliverable. Based on these inputs, we have arranged the concepts into five main categories: seeds and plant varieties; seed networks; conservation of plant genetic resources; agrobiodiversity governance; and diverse food and farming systems. One information sheet has been prepared on each topic.

An alphabetized glossary including simple definitions for each of the concepts included in the information sheets is included after the texts of the information sheets followed by a list of resources consulted in preparing these materials. The intention is that these information sheets will later be supplemented by concrete examples, interview quotes, and other materials that link to case studies, the network map, and other Dynaversity project elements and deliverables.

1. Information Sheets

In order to help explain the importance of the concepts, the contexts in which they are differently used, and the debates or controversies which at times surround them, we have prepared short information sheets on each of these main topics intended for use both by a lay audience and by practitioners in the field.

The five information sheets are structures around the following guiding questions:

Seeds and Plant Varieties:
What are the differences between various types of seeds and plant varieties & why are they significant?

Seed networks:
Who manages seeds and plant genetic resources, and how?

Conservation of Plant Genetic Resources:
How can we conserve agricultural diversity for future generations?

Agrobiodiversity Governance:
How do laws and international treaties affect seeds and plant varieties?

Diverse Food and Farming Systems:
What is the role of diverse seeds and plant genetic resources in the broader food system?

Each information sheet concludes with a short summary and analysis related to the broad categories of our analytical framework of knowing, doing, framing, and organising. These help us reflect on the significance of these concepts in relation to how knowledge about seeds and plant varieties is produced, circulated, or excluded; what practices by which actors are important for the maintenance of plant genetic resources; how different actors and institutions frame and reframe activities related to agrobiodiversity governance; and how the knowledge, practices, and networks related to seeds and plant genetic resources can help us reframe and reorganize food and farming systems in a more sustainable way.

1.1. Seeds and Plant Varieties

What are the differences between various types of seeds and plant varieties & why are they significant?

- Farmers have been selecting and saving seeds with the best characteristics for use the following planting season for thousands of years. The resulting varieties are often called **landraces, traditional varieties,** or **local varieties,** which are the product of **mass selection** and **local adaptation.**
- Farmers' landraces are **population varieties or open pollinated varieties**, rather than a uniform **variety,** as the **genetic diversity** at the population level helps provide insurance against unforeseen conditions (drought, flood, etc.). Crop populations can also sometimes interbreed with **crop wild relatives** but, as far as possible, farmers try to avoid such crosses because it will decrease crop quality. It is by positive (choosing the best plants) or negative (removing plants with undesired characters) mass selection that farmers developed all forms of population varieties (see **mass selection**).
- **Plant breeding** began as a scientific enterprise in the late 1800s, became widespread in public institutions in the 20th century, but by the late 20th century became dominated by commercial enterprises. In the 1930s breeding companies began producing **F1 hybrid seeds,** which are linked to high-input, productivity-oriented agriculture, and require that farmers keep purchasing seeds in order to ensure the same seed characteristics year after year. Varieties bred by plant breeders using specialized breeding techniques are sometimes called **"modern"** or **"improved"** varieties.
- In the 20th century, together with the spread of modern varieties such as pure lines and F1 hybrids, which required more agrochemical inputs and resulted in the increasing industrialization of agriculture, crop diversity has decreased. In addition, the vast majority of "modern" and "improved" seeds are now owned by a handful of private corporations. **Genetic diversity** has been dramatically reduced as breeders began relying upon fewer plant parents for increasing yields and productivity, resulting in a process of **genetic erosion** of varieties with other valuable traits**.**
- Nevertheless, many farmers have continued to save and select seeds of **farmers' varieties** for generations. Farmers are also beginning to collaborate with researchers in **participatory breeding** projects to develop new population varieties called **"peasant varieties".** In addition, many home gardener prefer **population varieties e.g. landraces, heirloom varieties**, old varieties or **heritage seeds,** which exhibit distinctive colours, tastes, and other traits.
- Seed-saving and selection are skills that anyone can learn, and many farmer and gardener and seed-saver organizations organize courses, seed exchanges, and have community seed banks and seed libraries where you can also get involved. Find active groups near you on the Dynaversity website!
- Summary and analysis: Plants and people have co-evolved over centuries. Different types plant varieties have developed over time through an interaction of human and natural selection processes. Human knowledge surrounding seeds, plant varieties,

and local food systems has developed over time, resulting in **landraces** and **farmers' varieties**, and is often location-specific. Specialized plant breeding is a relatively recent development in the longer history of the evolution of different seeds and plant varieties. Framing plant breeding through the lenses of **"modernization"** and **"improvement"** posits all other types of seeds and varieties as backwards and inferior. Yet too much reliance on plant breeding in laboratories at the expense of farmer management and selection systems has devalued or delegitimized farmer knowledge and practices and deskilled farmers. But in the case of on-farm plant breeding, farmers and gardeners develop new skills of seed saving and selection methods, which are completely different from modern plant breeding. Such training is often organized by seed-savers' groups and **seed networks,** which are re-framing these problems and forming new modes of social organisation and social relations centred around seed exchange and plant breeding.

1.2. Seed Networks

Who manages seeds and plant genetic resources?

- When farmers save seeds for the next planting and select seeds and plant varieties for specific and preferred characteristics of seeds, they promote the **local adaptation of plant varieties** that represent an **evolution** of ***in situ*** **plant genetic resources (PGR)**. This interaction between farmer, environment, and seed is the most basic level of a seed system's operation that involves **farmer selection and seed management.** Often seeds are also managed not by individual farmers but at the community level and stored in **community seed banks.**
- Farmers have also long relied on **seed exchange** practices to ensure the **genetic diversity** of seeds. The rules and norms of seed exchange practices differ across cultures and societies, but were often associated with marriage and kinship rituals in traditional societies. Seed exchange can also take place at local markets and dedicated fairs, which are often pivotal for farmer seed security and genetic diversity renewal. New farmer **seed networks** are springing up in many parts of the world as ways to organize social networks around seed exchange to enhance agroecological practices and decrease **genetic erosion** processes.
- Since the advent of specialized breeding and increasingly strict seed regulations, a divide has developed in the **seed system** between what has been called the "**formal seed system**," through which commercial, "**modern,**" "**improved" varieties** and **"certified" seeds** circulate, and the **"informal seed system**," based on the continued exchange of seeds between farmers and gardeners. In parallel, crop diversity began to be considered as a "resource" for breeding purposes (see *Conservation of genetic resources* info sheet).
- The **"informal seed system"** is often associated with **indigenous local knowledge (ILK)/traditional knowledge/traditional ecological knowledge (TEK)** and **indigenous research.** Farmers experiment with different seeds to see which will work best in various conditions. Through this they gain knowledge about seed characteristics in the context of ***in situ*** **or on-farm** seed production and conservation, and the performance of seeds in particular locations. Such information is gained by interaction and experience in living with and using seed, and is often associated with specific groups of local people living in a particular environment, tied to the **cultural heritage** and history of these groups. In this way seeds are themselves part of **cultural heritage**. These diverse varieties are constantly evolving and adapting to local conditions and climate change, increasing the adaptive capacity and resilience of farmers and ecosystems to climate change. Despite prevalent misconceptions that position informal farmer seed systems as disappearing, about 80 percent of the world's seed stock still comes from these systems.
- In contrast, **"formal seed systems"** are thought to circulate **"modern"** and **"improved"** seeds, which are bred to meet **seed certification** and **variety registration** requirements that arise from **national and EU seed legislation**. Plant varieties must be proven to be **"distinct, uniform and stable" ('DUS' tests)** and seeds are tested for germination rates and phytosanitary health. This maintains varieties as static, rather

than dynamic entities. These criteria are important for commercial **seed marketing**. **Farmer varieties** and farmer-saved seeds, which are often grown as a **population,** don't need and cannot meet these requirements. These criteria also serve to remove seeds from the contexts and social networks through which they have gained significance. In the service of "modern" and "formal" seed systems, seeds of, for example**, landraces**, **heirloom and old varieties**, are transformed from holistic living organisms into **plant genetic resources,** valued for their potential to be used in future breeding work. Referring to seeds as resources is controversial, because it can lead to a mechanistic and reductionist view of life and a sense of human domination over nature.

- Tensions exist between **"formal" seed systems**, which are often associated with large-scale conventional and **industrialized agricultural systems**, and **"informal" seed systems**, which are associated with small-scale production, and more likely to be based on **agroecology** and **organic agriculture** methods**.** Stakeholders in these different systems often hold different visions of the future of agriculture, which can make cooperation difficult.
- Maintaining a dichotomy between the formal and informal seed systems is problematic, however, and can perpetuate stereotypes. In reality, seeds often circulate through both formal and informal systems. It is more useful to speak of one integrated **seed network** that connects various actors, institutions, and types of seeds with different purposes, uses, and users. Both types of systems need to operate in complementary fashion with the aim of maintaining **agrobiodiversity.** Nevertheless, the connections between both systems should be accompanied by more transparency about the breeding methods used by the formal system. Organic agriculture should avoid all forms of biotechnology to meet the organic principles as defined by IFOAM (International Federation of Organic Agricultural Movements).
- Summary and analysis: Both farmers and specialized breeders possess important knowledge and engage in key practices to save, manage, and reproduce seeds and plant varieties. Both **"formal"** and **"informal" seed systems** rely on different context-based knowledge; it is not only the contexts that differ (laboratory versus farm) but the overall paradigm: one is based on the market, while the other is based on a more holistic understanding of life. Framing seed systems as "formal" or "informal" gives an impression of the latter as less important, or as producing seeds of lesser quality, which is inaccurate. Complementary **seed networks** can be considered as an important mode of organizing social relations around seed exchange that can help maintain **genetic diversity** and **agrobiodiversity,** as long as there is transparency about breeding methods.

1.3. Conservation of Plant Genetic Resources

How can we conserve agricultural biodiversity for future generations?

- Seeds and **plant varieties** developed by farmers over generations are currently valuable both as living organisms and as **plant genetic resources.** The diversity of these plant genetic resources together constitutes the **agrobiodiversity** of our food systems. The preservation of **plant genetic diversity** for future generations is now through either ***ex situ*** or ***in situ*** **conservation** approaches.
- Nikolai Vavilov, a geneticist working in the 1920s in the Soviet Union was the first to propose the term **plant genetic resources**, as he was interested in collecting the "best" varieties of plants from around the world to help modernize national agriculture in the Soviet Union. He started what may be called the first genebank, the Leningrad Plant Breeding Institute. Later genebanks were established all around Europe, following Vavilov's work. This has often led to appropriation of **plant genetic resources** from the Global South to the Global North for inclusion in herbaria and plant collections in the colonial era, and later in **genebanks**.
- **Genebanks** are also called ***ex-situ*** *(off-site)* **conservation** of plant genetic resources. Each seed or plant included in a gene bank is called an **accession.** Once in a genebank, the plants and seeds are sometimes regarded as **germplasm** or **genetic material,** valuable for their specific **genes** or **alleles,** rather than the plant as a whole. New breeding techniques sometimes use only certain **genes** from a plant, rather than the whole. Seeds in genebanks are often stored frozen and periodically thawed, tested, and regrown. This can be problematic in case of climate change or changes in the intervening period to which the plant is not adapted.
- In the 1970s and 1980s breeders and seed companies have been interested in maintaining collections in genebanks as **"genetic material"** to create new commercial varieties. Institutions such as the Consultative Group for International Agricultural Research (CGIAR) and the International Board for Plant Genetic Resources (today called Bioversity International) started to develop an international network of genetic resources, especially to make genetic resources more accessible to breeders. This approach of rendering plants as plant genetic resources or genetic material is sometimes controversial, however, as it separates the plant from the socio-ecological contexts in which it has adapted and where it is valued for particular characteristics.
- Farmer continued management and use of their seeds, breeding their own varieties on their farms and in their communities, is an alternative way of ***in situ (or on farm)*** **conservation.** These varieties, most often plant populations, are **locally adapted** and constantly **evolving** along with the climate and growing conditions. Farmers may use each variety for different uses (culinary, ritual, ecological, social, etc.) and even may create new uses for our contemporary society. It is through their continued use and circulation that they are conserved, called **sustainable use.**
- Due to increasing fears over **genetic erosion** in the 20th century, the **FAO Plant Treaty** outlines a framework for the **"conservation and sustainable use"** of **plant genetic resources.** Despite their differences, rather than seeing ***in situ*** and ***ex situ***

conservation as opposed to one another, both at the present time should be used as complementary approaches to **conservation and sustainable use** of plant genetic resources. *In situ* conservation holds much promise for protecting crop diversity for the future.

- **Dynamic management** of plant genetic resources is an alternative strategy to both ***in situ*** and ***ex situ,*** which aims to conserve not only specific genes, alleles, or plants, but rather the environments in which genetic diversity can continue to evolve at the population level.
- Summary and analysis: Both ***in situ*** and ***ex situ*** approaches to conservation require specific knowledge and practices in order to develop (*in situ*) and to maintain (*ex situ*) plant genetic resources for the future. *In situ* conservation is important in order to promote a broader agroecological transition in agricultural systems. Innovative hybrid forms, such as **dynamic management** of plant genetic resources are needed, as well as new modes of organizing on farm breeding in order to face future environmental changes.

1.4. Agrobiodiversity Governance

How do laws and international treaties affect seeds and plant varieties?

- Seeds and plant varieties were seen as a **common pool resource** for generations, as they were managed and freely exchanged among farmers, without any form of exclusive property rights. Since the middle of the twentieth century, seeds and plant varieties are increasingly governed by a number of laws and international treaties, many of which have begun to create private (intellectual) property out of seeds, plants, or their parts.
- The most important international treaties are the **UPOV (Union for Plant Variety Protection) Treaty** of 1961, the **Convention on Biological Diversity (CBD)** of 1992, and the **International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)** of 2001.
- The UPOV treaty, signed in 1961, but revised in 1978 and 1991, grants breeders **intellectual property rights (IPRs)** on new varieties, also referred to as **breeders' rights.** New varieties must be **novel, distinct, uniform and stable,** which are the opposite of characteristics that make farmers' varieties desirable (genetically diverse and adaptable to changing conditions)**.** Breeders earn an honorarium on the sale of seeds of protected plant varieties for a period of twenty years, and researchers must request permission to use the variety for breeding purposes. While the "breeders' exemption" in UPOV allows breeders to use protected varieties for research purposes to develop new varieties, this same right is not allowed for farmers - as amateur breeders. Furthermore, the "farmers' exemption"/ "farmers' privilege," designed to allow seed-saving, has been increasingly restricted in more recent versions of the treaty, allowing small farmers to re-sow protected varieties for subsistence purposes, but not to save, exchange, or sell seeds. Another type of protection which is increasingly used as a form of intellectual property rights on seeds and plant varieties is the patent, which does not have either breeders' or farmers' exemptions. Although IPRs are meant to stimulate innovation, there is increasing concern that they may do the opposite.
- The **CBD** granted states sovereign rights over genetic resources in 1992. The CBD requires "fair and equitable" **Access and Benefit Sharing (ABS)** and "prior informed consent" in the commercialization of genetic resources, but defining the country of origin for crops or varieties that are the product of generations of natural and human selection is often complicated or impossible. The **CBD's Nagoya Protocol,** which entered into force in 2014, further delineates rules for access and benefit sharing, but does not develop specific rules for plant genetic resources for food and agriculture. Few countries have developed national legislation required for implementation, therefore progress has been slow.
- The **World Trade Organization's (WTO) 1995 TRIPS Agreement** also requires all states joining the WTO to adopt some form of plant variety protection and prohibits seed exchange. Countries are often required to harmonize their **national seed legislation** with the UPOV Treaty when joining Free Trade Agreements, previous national agreements notwithstanding. International treaties such as UPOV and the

TRIPS agreement thus in some ways limit state sovereignty to govern their genetic resources.

- The **FAO Plant Treaty** or **ITPGRFA** came into force in 2004, creating **farmers' rights** as a counter-balance to **breeders' rights,** defining **farmers' rights** to save, exchange, and sell seeds. It also created a **Multilateral system (MLS)** for **access and benefit sharing** for particular crops.
- **EU Seed legislation** is among the most restrictive in the world, deriving from a moment of concern with high productivity in agriculture after the Second World War. These laws only allow the sale of seeds that have been registered in the EU Common Catalogue of Plant Varieties or a National Catalogue. In 2009 the **Conservation Variety** Directive created a small space to allow for seeds of non-registered landraces and traditionally grown varieties on non-commercial value, known as **conservation varieties** and **amateur varieties,** to be sold for conservation purposes, but many restrictions are still in place.
- There was an attempt to reform EU seed laws in 2014, but it was stopped by opposition in the EU Parliament, largely due to campaigns by seed-savers' and farmers' groups who were concerned that the laws would still restrict the conservation of agrobiodiversity and favour corporate seed companies.
- A recent positive development in EU seed legislation is in the new legislation on organic agriculture, which creates a special allowance for the sale of seeds of plant populations or **"organic heterogeneous material,"** and for "**organic varieties suitable for organic production."**
- The debate over which kind of seed regulations should be put in place is largely a debate over whether seeds should be governed as a **common pool resource,** private property, or a **protected commons.** The goal is to define ways to provide access to and protect agricultural diversity without allowing anyone to appropriate it for their exclusive benefit. One innovative approach of defining seeds as a protected commons is the **Open Source Seed Initiative (OSSI)**, modelled on open source software. Anyone may use the open source seed varieties for any purpose, but only if they pledge to not apply intellectual property rights to them, or any new varieties derived from them, in the future.
- Legislation governing seeds and plant varieties reflects the uneven power dynamics between farmers, gardeners, consumers, scientists, researchers, breeders, and government officials, and corporations. The ongoing struggle between breeders' rights and farmers' rights is part of a larger **environmental justice** and **food sovereignty** issue, whereby not all parties have the same rights to have their ways of life recognized, the right to participate in decision-making, or to benefit from access to environmental goods, such as agricultural biodiversity.
- Summary and analysis: **Breeders' rights** have to date been protected more than **farmer's rights**, and access to **plant genetic resources** and the sharing of benefits derived from them remains uneven. Laws often favour expert knowledge and the products that result from breeding as a specialized plant science, over the knowledge of farmers and gardeners, and at times even criminalize **seed exchange** practices. Farmers are framed as end users of seeds as resources rather than actual or potential breeders and managers of seeds and plant genetic resources. **Seed networks** are actively involved in negotiations over legislation and in developing new ways of organizing social relations surrounding seeds as resistance to unjust laws.

1.5. Diverse Food and Farming Systems

What is the role of diverse seeds and plant genetic resources in broader sustainable food systems?

- Access to diverse seeds is the foundation of access to food; **diverse food and agricultural systems** are the cornerstones for preserving plant **genetic diversity** for future generations and for creating **sustainable agriculture systems.**
- The 20th century has resulted in an unprecedented industrialization of agricultural systems based on **monocropping,** increasingly based on **GMOs,** and high inputs of agrochemicals and fossil fuels. In these **industrial agricultural systems**, seeds are just one of many commercially produced inputs, rather than produced on the farm. These changes have resulted in important social and environmental consequences, such as soil degradation, genetic erosion, water contamination, overuse of fossil fuels, increasing income inequalities, poverty, higher proportion of joblessness, decreasing rural population, failure of local community organisations, decreasing quality of public services, and others.
- In response to the growing trend toward industrial-scale farming and the increasing homogenization of crops and genetic erosion, Via Campesina has begun an international alliance of organizations of peasant and family farmers, farm workers, indigenous people, landless peasants, and rural women and youth, popularizing the concept of **food sovereignty**.
- **Food sovereignty** is a term that understands the connection of people to the environment, asserting that all people have the right to food and to determine its means of production. Included in this is the intersection of elements necessary to provide food for human mouths, such as provision of land, water, air, and political ability to exercise this right to food. **Seed sovereignty** is a key element of food sovereignty. **Food sovereignty** addresses systemically many of our current crises and is a place to begin to work on such issues.
- Many peasant and small farmers rely on practices of **'agroecology**', or **organic agriculture**, focusing on **food quality** and creation of healthy food. This often involves inter-planting various crops in a polyculture, and using a diversity of locally adapted seeds and plant varieties. These systems produce food while fostering **agrobiodiversity,** creating space for many different life forms to inhabit, and assuring human interactions based on communality, reciprocity, equity, grassroots or democratic processes and many knowledge systems as a way to move toward **food democracy**. Directly addressing the trend of homogenization in agriculture, a **diversified food system** is part of a **sustainable food system/eco-agri food system.** It is therefore necessary to use interdisciplinary and transdisciplinary research approaches that understand food production from many different human and nonhuman perspectives in order to fully understand and create more sustainable food systems.
- Summary and analysis: Differences in knowledge and practices surrounding seeds and plant varieties undergird differences in visions of agricultural sustainability and of plant breeding approaches. A diverse seed supply is needed for diverse and

sustainable food and agricultural systems based on agroecology. The frames of **food sovereignty** and **food democracy** can help re-envision and reorganize current agricultural systems along more sustainable lines.

2. Glossary

ABBREVI-ATION	*TERM*	DEFINITION
ABS	*ACCESS AND BENEFIT SHARING*	When a country signs the FAO Plant Treaty, it agrees to provide access to users in other ratifying countries to the plant genetic resources housed in its genebanks. This is important because it allows breeders, researchers, and farmers to make use of the great genetic diversity present in currently and formerly used seeds and plant varieties. Parties who receive plant genetic resources through the multilateral system (MLS) for research, breeding, or training purposes agree to make newly derived varieties available for future research and breeding, or pay a certain percentage of commercial profits into a benefit sharing fund. To date, while access has been facilitated by the treaty, no money has been paid into the fund for benefit sharing.
	ACCESSION IN GENEBANK	Once an individual sample of a seed or plant is entered into a genebank, it is labelled as an accession, with information about where the sample was collected. Genebanks often have numerous accessions of the same plant or variety that have been collected in different localities or from different sources.
	AGROBIODIVERSITY	The FAO defines agrobiodiversity as "The variety and variability of animals, plants and micro-organisms that are used directly or indirectly for food and agriculture, including crops, livestock, forestry and fisheries. It comprises the diversity of genetic resources (varieties, breeds) and species used for food, fodder, fibre, fuel and pharmaceuticals. It also includes the diversity of non-harvested species that support production (soil micro-organisms, predators, pollinators), and those in the wider environment that support agro-ecosystems (agricultural, pastoral, forest and aquatic) as well as the diversity of the agro-ecosystems." This diversity is important at the genetic, individual, population, variety, and species levels, as diversity can help plants adapt to changing conditions; diversity of crops and crop varieties can provide health and economic benefits to farmers, crop diversity can promote increased associated biodiversity in surrounding landscapes, including more birds, animals, wild plants, etc.
	AGROECOLOGY	Agroecology is a social movement based on a set of practices related to the ecological management of food systems as agroecosystems. It is now also a scientific discipline which aims to apply ecological principles to agroecosystems.
	ALLELE	Alleles are various forms of information located in genes inherited from different parents that occur in the same place in the genome. A plant expresses the different traits carried by the interaction of alleles of the same gene of both parents. The arrangement of alleles determine the plant genotype: it may be homozygous (two of the same allele), heterozygous (different alleles), or hemizygous (only one allele). Plants that express similar characteristics over time are often homozygous for that trait.
	AMATEUR VARIETIES	The 2009 EU Conservation Variety directive defined amateur varieties as those with no intrinsic value for commercial production, but only for biodiversity conservation. These are subject to an exemption from some of the norms of EU seed legislation.
	BIODIVERSITY	Biodiversity is a contraction for biological diversity. Article 2 the Convention on Biological Diversity defines biological diversity as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems."

	BREEDERS' RIGHTS	Breeders' rights originate in the 1961 UPOV Treaty, which protects breeders' intellectual property rights on new plant varieties as a form of plant variety protection for a period of twenty years. Farmers must pay royalties when they use protected varieties of plants, and must ask for permission to reproduce the varieties. New varieties must be novel, as well as undergo DUS tests for distinctness, uniformity, and stability.
CPR	***COMMON POOL RESOURCE***	A common pool resource is one over which no one has any property rights.
	COMMONS	Unlike common pool resources, commons are resources that are jointly governed by a community with norms and rules. Elinor Ostrom has designed eight principles for sustainably governing commons.
	"COMMONING"	The practices of making or negotiating a commons. This includes harmonic interaction and shared understanding with other living elements of the systems that give support and life to humans. As such, commoning is a social and natural, living, dynamic field of practice.
CSB	***COMMUNITY SEED BANKS***	A jointly managed place (or places organised in network) to store seeds or material for propagation and conserve plant and seed diversity collections, typically arranged with informal or semi-formal roots in civil society.
	CONSERVATION of PGR	One of the main aims of the FAO Plant Treaty is the Conservation of Plant Genetic Resources. This means maintaining the full range of genetic variation within particular species. This is done both by maintaining the farming systems through which this variability emerged and has been maintained in the past (*in situ* or on farm conservation), and by storing copies of currently existing plant genetic resources in genebanks (*ex situ* conservation).
	CONSERVATION VARIETY	Commission Directive 2009/145/EC was adopted in the EU in 2009, to create exceptions to the EU seed marketing laws for vegetable varieties and landraces that have been traditionally grown in specific regions but are now under threat of genetic erosion.
CBD	***CONVENTION ON BIOLOGICAL DIVERSITY (CBD) OF 1992***	The 1992 Convention on Biological Diversity (CBD) created a legally binding framework for conserving and using biodiversity. The CBD gives states sovereign rights over biodiversity and products derived from it. Agricultural biodiversity is included but not differentially regulated.
CWR	***CROP WILD RELATIVES***	Crop wild relatives are wild plants that are closely related to crop plants. When they cross-pollinate, they may increase the genetic diversity of crops.
	CULTIVAR	The term 'cultivar' may be used to encompass all types of cultivated varieties since the word 'variety' is now used by regulatory systems to designate uniform and stable varieties (see UPOV definition). In the LIVESEED project, the word 'cultivar' is defined as follows: "general term for officially released varieties, landraces, less homogeneous populations, niche varieties, etc."
	CULTURAL HERITAGE	Inherited knowledge, behaviours, and values from previous generations including living beings, non-living beings, traditions, places, practices, and situations.
DUS	***DISTINCTNESS, UNIFORMITY AND STABILITY TESTS***	DUS tests are required for variety registration in the EU. A variety is considered distinct if it possesses one or more traits that differentiate it from other plants registered in the catalogue. A variety is uniform if all offspring produce similar characteristics in the next generation, and stable if it continues to produce plants with similar characteristics in subsequent generations. These criteria are difficult for farmers' varieties to meet due to their genetic diversity. DUS tests also carry a fee which can be burdensome for farmers to pay in order to attempt to register a variety.

	DIVERSIFIED FOOD AND AGRICULTURAL SYSTEM	Diversified food systems promote multiple crop varieties, animal breeds and end products, considering a diversity of consumers, diets, and needs according to diverse environmental, socioeconomic, and cultural contexts.
	DYNAMIC MANAGEMENT OF PLANT GENETIC RESOURCES	Dynamic management is a way to conserve not only specific accessions, or only genes with alleles of interest, but rather also the entire cultural and environmental context surrounding cultivation. This creates spaces where plants and populations are able to keep adapting to changing conditions.
	ENVIRONMENTAL AND ECOLOGICAL JUSTICE	Environmental justice refers to the rights of all communities to equally share environmental benefits and burdens, the right to have one's way of life recognized, and the right to participate in environmental decision-making. It stems from many cases that have revealed disproportionate burdens and institutionalized racism against people of colour, minorities, indigenous people, low income groups, women, and others. Access to a diversity of seeds and food and the right to participate in decision-making regarding their conservation and use, as issues of food and seed sovereignty, are also key environmental justice issues.
	EU SEED LEGISLATION	EU seed legislation stems back to the post- WWII period when there was concern about productivity and hunger. Ten different Directives governing seeds of particular types of plants. These laws require all plant varieties of which seed is to be marketed for commercial purposes to be registered in the EU Common Catalogue or a National Catalogue. In order to be registered as a variety seeds must undergo DUS and VCU tests, which are both bureaucratically and economically burdensome for farmers, and which may not be possible for farmers' varieties with more genetic diversity to pass. These laws have been implicated in causing genetic erosion, as they limit the diversity of varieties sold, and give precedence to commercial varieties. There are also specific rules on seed certification, packaging, and labelling.
	EVOLUTION OF PGR	After initial domestication of crops, through which they first become distinct from their wild crop ancestors, crop plants continue to change over time as dynamic living entities. Plants may change in size or shape, in growth habit, in their adaptation to a particular environment or growing condition, in nutrient contents, and other ways. In crop plants this often happens as a combination of human and natural selection.
	EX-SITU CONSERVATION	*Ex situ* conservation refers to the conservation of plant genetic resources, or seeds and plant varieties, in an institutional setting rather than through cultivation in the place where it was developed. Often this is done in genebanks, where seeds are frozen and periodically regrown in controlled conditions, and tested for germination rates, etc. This approach conserves the characteristics of the seed or plant variety at the time they were collected and stored in the genebank, rather than allowing for continued evolution of the plant.
	F1 HYBRID SEEDS	F1 refers to "filial one," which is the first generation of offspring from the cross of two inbred lines of plants. This is accomplished by first selecting two parents with the desired characteristics to cross, then inbreeding each of the parents with similar plants for several generations to produce pure inbred lines (homozygous), and finally crossing the two inbred lines with the use or introduction of a hybridisation system to force pollination of one parent by the other. The first generation of offspring resulting from the first crossing of these pure inbred lines will result in what is known as hybrid vigour, producing plants that may perform better than open-pollinated varieties, but only in the first generation. Because F1 hybrids are the result of crossing two inbred lines, the next generation will not give the same results if seeds are saved and resown. This makes farmers dependent on specialized seed producers to keep buying the F1 hybrid seeds.

	"FAO PLANT TREATY"	See 'International Treaty on Plant Genetic Resources for Food and Agriculture' (ITPGRFA).
	FARMER SELECTION AND SEED MANAGEMENT	Farmer selection and seed management are a fundamental aspect of food systems that involve the interaction of human and natural selection, based on farmer preferences, culture, environmental suitability and other locally-relevant and situated criteria. Through farmer selection and management of seeds, plant populations and traditional varieties constantly evolve, replacing some varieties completely, or changing in a continuous process of adaptation to a given environment.
	FARMERS' RIGHTS	The term 'farmers' rights' originates from the 2001 FAO Plant Treaty, which defines that farmers have the right to save, use, exchange, and sell seeds, as well as to participate in decision-making about plant genetic resources.
	FARMERS' VARIETIES	Seeds that have been selected and managed by farmers are often referred to as farmers' varieties. These are often open-pollinated, genetically diverse, and locally adapted populations of plants that continue to evolve in response to changing circumstances.
	FOOD DEMOCRACY	Peoples' right to decide their food culture in food production, processing, and consumption, entailing citizen engagement, empowerment, and responsibility of all actors.
	FOOD QUALITY	Food quality extends to multiple (external and internal) aspects of food assessed by consumers.
	FOOD SOVEREIGNTY	Food sovereignty is the acknowledgment of the right of people to define their own food, agriculture, livestock and fisheries systems and policies. Food producers, distributors, and consumers seek to take control of the mechanisms and policies of food production and distribution, rather than leaving these to market institutions and corporations that dominate the global food system.
	FORMAL SEED SYSTEM	The term "formal seed system" is often used as shorthand to describe the system whereby seed exchange became aligned with the market economy, which demanded more standardization of seeds as marketable products. Until the 20th century seed was primarily exchanged informally, and as such the formal system of seed exchange has arisen from so-called informal systems, and still functions in parallel to them. A central and primary focus of this process is the naming of seed as distinctly identifiable varieties, often claiming intellectual property rights on them, allowing seeds to be classified and regulated (through seed certification, DUS tests, etc). This is done in the effort to maintain a certain 'purity' and uniformity, which provides consumers with known physical, physiological, and sanitation quality- controlled seeds, but may conflict with farmer seed management systems that rely on diversity instead of purity.
	GENEBANKS	Genebanks are institutions that store, maintain, and reproduce collections of living plants of crops and wild crop relatives. These may be stored in the form of plants, seeds, embryos, meristems, cells, or DNA as different types of plant genetic resources. Genebanks may make small quantities of materials from these collections available to farmers, researchers, and breeders.
	GENES	A gene is the carrier of hereditary information, such as particular plant traits, on the chromosome.
	GENETIC DIVERSITY	The presence of genetic variability within a species, both within and across populations and varieties. These genetic differences allow for adaptation and increase the potential to breed for specific characteristics.

	GENETIC EROSION	Genetic erosion is the loss of genetic diversity, or the decrease of genetic variability within or between varieties, populations, or species over time. Genetic erosion can be caused by both human and environmental factors.
	GENETIC MATERIAL	Seeds and plant varieties collected into genebanks, when used for the purposes of breeding new varieties, are often referred to as germplasm or genetic material, which refers to only the raw material that is seen as useful to the breeding industry. The terms germplasm and genetic material are sometimes controversial, because they prioritize only certain traits, characteristics, or genes of plants rather than the whole plant as a living organism and the socio-ecological context from which it emerged.
GMO	***GENETICALLY MODIFIED ORGANISM***	The World Health Organisation defines GMOS as "organisms whose genetic material (DNA) has been modified in a way that does not occur naturally, e.g. through the introduction of a gene from a different organism." GMOs are just one form of an increasing array of genetic engineering approaches encountered today. Genetically engineered seeds and plants may not be used in organic agriculture systems and are not considered an inherent part of agricultural biodiversity.
	GERMPLASM	Seeds and plant varieties collected into genebanks, when used for the purposes of breeding new varieties, are often referred to as germplasm or genetic material, which refers to only the raw material that is seen as useful to the breeding industry. The terms germplasm and genetic material are sometimes controversial, because they prioritize only certain traits, characteristics, or genes of plants rather than the whole plant as a living organism and the socio-ecological context from which it emerged.
	GREEN REVOLUTION	The Green Revolution refers to a period beginning in the 1950s when research foundations such as the Rockefeller Foundation promoted the use of "modern" and "improved" crop varieties abroad, first in India and Mexico, but eventually spreading throughout the Global South. Yields were improved if the seeds were sown with high amounts of external inputs and irrigation, but came at a high social and environmental cost. Often these new varieties may have displaced locally adapted seeds and traditional knowledge.
	HEIRLOOM VARIETIES/ HERITAGE SEEDS	Heirloom varieties and heritage seeds are usually open-pollinated plant varieties that are at least fifty years old, having been passed down from generation to generation.
	HYBRID	Plants resulting from the cross of two different varieties are considered a hybrid. See F1 hybrid.
ILK/TK/ TEK	***INDIGENOUS LOCAL KNOWLEDGE /TRADITIONAL KNOWLEDGE /TRADITIONAL ECOLOGICAL KNOWLEDGE***	Local, indigenous, and traditional knowledge are terms that refer to experience accumulated and shared as a product and process of evolution, and gained by direct engagement in and observation of the world. This includes shared knowledge and interactions with cultural progenitors such as elders, community rituals and storytelling, and insights gleaned or gifted through spiritual origins. This knowledge is imbued with specific values relevant to the cultural and common epistemic shared understandings of place and identity of a particular group.
	INDIGENOUS RESEARCH	Indigenous research is the experimentation of farmers with different seeds to see what kinds of seeds will work in various conditions, recombining genetic resources in the process and using methods suitable to indigenous diversified food systems.
	INDUSTRIAL AGRICULTURAL SYSTEMS	Industrial agricultural systems are food systems that rely on monocrops, modern crop varieties, fertilizers, pesticides, and fuel-based mechanical inputs, aiming at high productivity, but carrying high environmental and social costs.

	INFORMAL SEED SYSTEM	"Informal seed system" is a term often used as shorthand for the processes that have for centuries connected human and nonhuman factors to food production in a landscape. Specifically denoted in these interactions are the typically local, community-based ways that farmers and other caretakers of the seed produce, disseminate, and procure seed - either directly from own-harvests, from friends, neighbours, or kin, and through local markets and grain traders. Local knowledge, standards, and social structures guide informal seed system performance. These systems co-exist in parallel with and in interaction with so-called formal systems, therefore both systems are better seen as integrated.
	IN SITU / ON FARM CONSERVATION	*In situ* conservation refers to the conservation of plant genetic resources, or seeds and plant varieties, through continued cultivation in their natural surroundings or in the places where they were originally developed and have adapted to the local environment and growing conditions. On farm conservation also refers to conservation through cultivation, but may be done by farmers in other localities than the places where the plant populations and varieties originally developed. These approaches allow for continued evolution of the seeds and plant varieties as they adapt to changing conditions, but may mean that particular traits are lost. Adverse conditions could also mean that all seeds of a particular population or plant variety might be lost if they are not also stored or grown elsewhere.
IPRs	***INTELLECTUAL PROPERTY RIGHTS***	Intellectual property rights (IPRs) are legal rights granted to recognize the human innovation invested in the development of a new plant variety with particular characteristics. This can take several forms: plant variety protection, patents, etc. IPRs on plants are controversial because they recognize only the recent research contributions by breeders, rather than the generations of human and natural selection that preceded it. They also require novel, distinct, uniform and stable varieties, which are characteristics that are not often met by farmers' varieties with more genetic diversity.
ITPGRFA	***INTERNATIONAL TREATY FOR PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE***	The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA or "FAO Plant Treaty") was signed in 2001 and entered into force in 2004 with the aim of creating a legally binding framework for the conservation and sustainable use of plant genetic resources, or seeds and plant varieties. It defined for the first time farmers' rights as a counterweight to breeders' rights, and created a multi-lateral access system for plant genetic resources stored in genebanks.
	LANDRACE	Landraces are populations of plants of crops that have been selected and managed by farmers over time. They have adapted to a particular environment, and exhibit a high degree of genetic variability within the population.
	LOCAL ADAPTATION	Plants are considered locally adapted to a particular environment when they perform better in those conditions than other plants of the same species. This does not usually depend on one trait, but rather on combinations of factors, which allow the plant to better take advantage of nutrients, water, or light, or better defend itself against unfavourable conditions. Adaptation can also be inherited by the next generation because it is genetically determined.
	LOCAL VARIETIES/ CULTIVARS	These are varieties that have been selected or bred for their adaptation to local environmental conditions. Local varieties may be used to designate wild plants as well, whereas local cultivars refer in particular to plants meant for human cultivation.
	MASS SELECTION	Mass selection is the process of saving seeds from plants that exhibit the most favourable characteristics in the field. This favours the reproduction of those characteristics in the next generation. It is how most landraces and old varieties were propagated throughout history.

	"MODERN"/ "IMPROVED" SEEDS OR PLANT VARIETIES	Modern plant breeding is often defined as improving the genetic potential of plants, therefore varieties that have been bred with scientific techniques or for commercial purposes are often referred to as "modern" or "improved" seeds or plant varieties. There is considerable debate about this term, however, as these varieties often require very specific conditions in order to perform well, and may perform much more poorly than landraces or old varieties in other conditions.
	MONOCROPPING	Industrial agriculture systems often rely on monocropping systems, whereby one main crop is grown intensively in large areas to accommodate industrial management and harvesting systems. The lack of crop rotation and intercropping of other species is damaging to soil and diminishes diversity. Monocrops rely on "modern" and "improved" seeds and plant varieties that will guarantee standardization, but require high amounts of external inputs.
MLS	***MULTILATERAL SYSTEM***	The FAO Plant Treaty created a Multilateral System (MLS) for accessing and sharing benefits derived from plant genetic resources among users in countries that have ratified the Treaty. It defines rules for the sharing of plant genetic resources held in public genebanks and research institutions of the 64 main agricultural species that make up 80 percent of our plant-based food supply. It provides access free of charge to small amounts of seeds and plants to be used for research, breeding, or training purposes. Parties accessing the materials may not protect them with intellectual property rights in the form they receive them (they may do so for plant varieties that they breed using these materials if they agree to pay a percentage of the benefits into a fund that supports conservation and sustainable use of plant genetic resources). Anyone wishing to access plant genetic resources via the multilateral system must fill out a request form, called a Standard Material Transfer Agreement (SMTA).
	NAGOYA PROTOCOL	The Nagoya Protocol was adopted as a part of the CBD in 2010, in order to provide more precise rules on access to genetic resources and equitable sharing of benefits derived from their use. Rules for access and benefit sharing differ from those in the FAO Plant Treaty, because the Nagoya Protocol follows the CBD's approach of a bilateral system, rather than the multilateral approach in the FAO Plant Treaty.
	NATIONAL SEED LEGISLATION	Each country has its own national legislation surrounding seed circulation, but in all EU countries these must be in line with EU seed directives. Countries must also harmonize their seed legislation with international treaties such as UPOV and the WTO TRIPS agreement.
	OLD VARIETIES	See 'Traditional varieties.'
	ON-FARM CONSERVATION	See *'In-situ* conservation.'
	OPEN POLLINATED	Open pollinated varieties are produced by plants that have been pollinated by insects, birds, wind, humans, or other natural sources. This ensures the flow of pollen among individuals and results in higher genetic diversity. Open pollinated populations will produce true-to-type seeds as long as the pollen is not spread amongst different varieties of the same species.
OSSI	***OPEN SOURCE SEED INITIATIVE***	OSSI is a joint initiative started in the US by plant breeders, farmers, academics, and seed companies to create a new way of simultaneously recognizing breeders' invested time and resources in creating new varieties, and maintaining free access to seeds and plant varieties. A pledge included on seed packages marketed under the OSSI logo allows anyone to use the seeds however they want, as long as they place no restrictions on anyone else's use of the seeds, or varieties bred from them, in the future. This is a form of protected commons.

	ORGANIC AGRICULTURE	The International Federation of Organic Agriculture Movements (IFOAM) (2005) definition of organic agriculture is: "Organic Agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved." Organic agriculture and agroecology are methods that are more suited to protecting agricultural biodiversity than industrial agricultural systems are.
	ORGANIC HETEROGENEOUS MATERIAL	The new EU Organic Regulation due to come into force in 2021 for the first time includes the possibility to market in the organic sector seeds that are not of one homogeneous variety, as defined in UPOV, but rather a heterogenous plant population.
	ORGANIC VARIETIES SUITABLE FOR ORGANIC PRODUCTION	The new EU Organic regulation set to come into force in 2021 also creates a space for the marketing of varieties that have been specifically bred under organic conditions and in order to be grown in organic conditions. These varieties will be better adapted to local agro-ecological management systems and respect organic principles about breeding methods and genetic resources.
	PARTICIPATORY BREEDING	In response to critiques that plant breeding after the Green Revolution left out many small farmers' needs, a new type of collaboration began in the 1980s between plant breeders and farmers, where farmers are involved in many of the stages of developing new varieties of plants adapted to their needs.
	PEASANT VARIETIES	Farmers and scientists in France and elsewhere are creating new collaborative partnerships to develop varieties well-suited for today's conditions, which have been called peasant varieties.
	PLANT BREEDING	Plant breeding involves using a variety of methods to change certain characteristics of plants. Modern plant breeding is increasingly done in laboratories with specific scientific tools. Modern plant breeding of crops has often favoured increases in yield at the expense of other traits. This contributes to genetic erosion because of the reliance on a narrower genetic base of plant parents.
PGR	***PLANT GENETIC RESOURCES***	Plant genetic resources refer to all reproductive material of crop plants and their wild relatives, considered valuable for human use.
	PLANT VARIETIES	See 'Variety'
	POPULATION	A group of individual plants of the same species growing in one geographic area that are able to interbreed. There is often considerable genetic variation within a population, allowing different individuals to adapt differently to changes in conditions.
	PROTECTED COMMONS	A protected commons is one in which there are clear boundaries that allow free exchange of materials, for instance seeds, according to set rules within it, but does not allow appropriation by others from outside. See also Commons.
	SEED	While seed is technically defined as the botanical term for the reproductive material produced from a fertilized flowering plant, it is used here more widely to include other types of plant reproductive material, including roots, tubers, cuttings, and others.
	SEED CERTIFICATION	EU seed legislation requires that seeds to be marketed for commercial purposes are certified. This means undergoing certain tests for purity, germination rate, humidity, and sanitary conditions, as well as inspection of seed production sites. This can create an undue bureaucratic burden on small or low-income farmers, preventing them from being able to sell seed.

	SEED EXCHANGE	Seed exchange is the practice of giving and/or receiving seeds, usually without the exchange of money. Many organisations now organize seed swaps, seed fairs, and seed exchange events with the explicit purpose of sharing and exchanging seeds. Seed exchange is sometimes directly or indirectly forbidden by seed legislation (see agrobiodiversity governance info sheet).
	SEED MARKETING	The most recent EU Seed Marketing directives define seed marketing as "the sale, holding with a view to sale, offer for sale and any disposal, supply or transfer aimed at commercial exploitation of seed to third parties." This is sometimes taken to mean that sale of seeds not for commercial end users (such as to private gardeners) does not constitute seed marketing and thus must not meet all of the same requirements. This is interpreted differently by different governments, however.
	SEED NETWORK	Seed networks are communities of interaction which have in common a shared interest in seed management and reproduction and food consumption. These include broader networks through which seed circulates and is exchanged or traded for research, use, and conservation purposes.
	SEED SOVEREIGNTY	Access to seeds, as the first link in the food chain, is a fundamental component of food sovereignty. Seed sovereignty entails farmers' and communities' rights to decide which types of seeds to grow, as well as the right to save, sell, and exchange seeds.
	SEED SYSTEM	The seed system includes not only seeds, but also all sources of seed; information and knowledge about seed characteristics; farmer preferences, behaviours, and sowing practices; and the transactional arrangements of seed that contribute to agricultural production of seed and food by farmers.
	SUSTAINABLE AGRICULTURE	Sustainable agriculture gives equal weight to environmental, social, and economic concerns in agriculture.
	SUSTAINABLE FOOD SYSTEM/ ECO-AGRI FOOD SYSTEM	Sustainable food systems preserve resource diversity for future generations, respect human values, and environmental richness. An eco-agri food system is a broad perspective of the food system that incorporates natural resources, social and cultural aspects, governance and economics, nutrition, health and well-being, and policy.
	SUSTAINABLE USE of PGR	The FAO Plant Treaty introduced as one of its main aims the Sustainable Use of plant genetic resources for food and agriculture, based on the idea that seed and plant genetic resources can best be conserved through their continued and appropriate use. Sustainable use must be supported by equitable policies, diversity-promoting research, and breeding and growing practices that include and draw upon local knowledge and locally adapted plants.
	TRADITIONAL VARIETIES	Mass selection (often along with geographic separation) of plants with favourable characteristics from plant populations of landraces resulted in the first differentiated varieties of plants, sometimes called old or traditional varieties. Through selection and management over time they have been stabilized to the point that they exhibit the same characteristics over time, but still maintain a high degree of genetic variability.
UPOV	***UNION FOR PLANT VARIETY PROTECTION TREATY***	UPOV is the Union for Plant Variety Protection Treaty, first signed in 1961, but subsequently revised in 1972, 1978, and 1991. It defines breeders' rights as a form of intellectual property rights on new plant varieties. It has been controversial because with every new revision it further limits farmers' rights to work with seeds.

	VARIETY	A term used in plant classification below the species level. Old and local varieties were selected from landraces over time, and often separated geographically, but modern varieties are developed using various plant breeding techniques. Stable and uniform varieties are important in order to market seeds and plants, but the maintenance of stable varieties can interfere with continued evolution and genetic diversity of seeds and plants.
	VARIETY REGISTRATION	See 'EU seed legislation'
VCU	***VALUES FOR CULTIVATION AND USE TESTS***	In order to register a new variety of cereal, oil, or fodder crops in the EU Catalogue, it must undergo VCU tests, which require that new varieties have higher yields. These criteria favour productivity over other desirable characteristics and tend to disqualify farmer varieties.
WTO TRIPS	***WORLD TRADE ORGANIZATION'S TRADE-RELATED ASPECTS OF INTELLECTUAL PROPERTY RIGHTS AGREEMENT***	The Trade Related Intellectual Property Rights Agreement came into effect in 1995 and requires all signing members of the World Trade Organization to establish minimum intellectual property rights standards in a number of realms, including on plant varieties.

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