Interreg Co-funded by the European Union

NEXT Black Sea Basin

SeedGuard

BSB00450, SEEDGUARD: Seed Guardians for Biodiversity, Agrobiodiversity, Ecosystem Services and Climate Adaptation

Module 1. A survey of origin, purpose and concepts on Community Seed Collections (CSCs) and Community Seed Banks (CSBs) for safeguarding the vegetable plant genetic resources (PGR)

pic 1. 158 ingredient salad list, September 18, 2017, Stephen Barstow, expert in the EEA Heritage Seeds project in Bulgaria

Activity 1.3. Trainings “Guardians of the Seeds”

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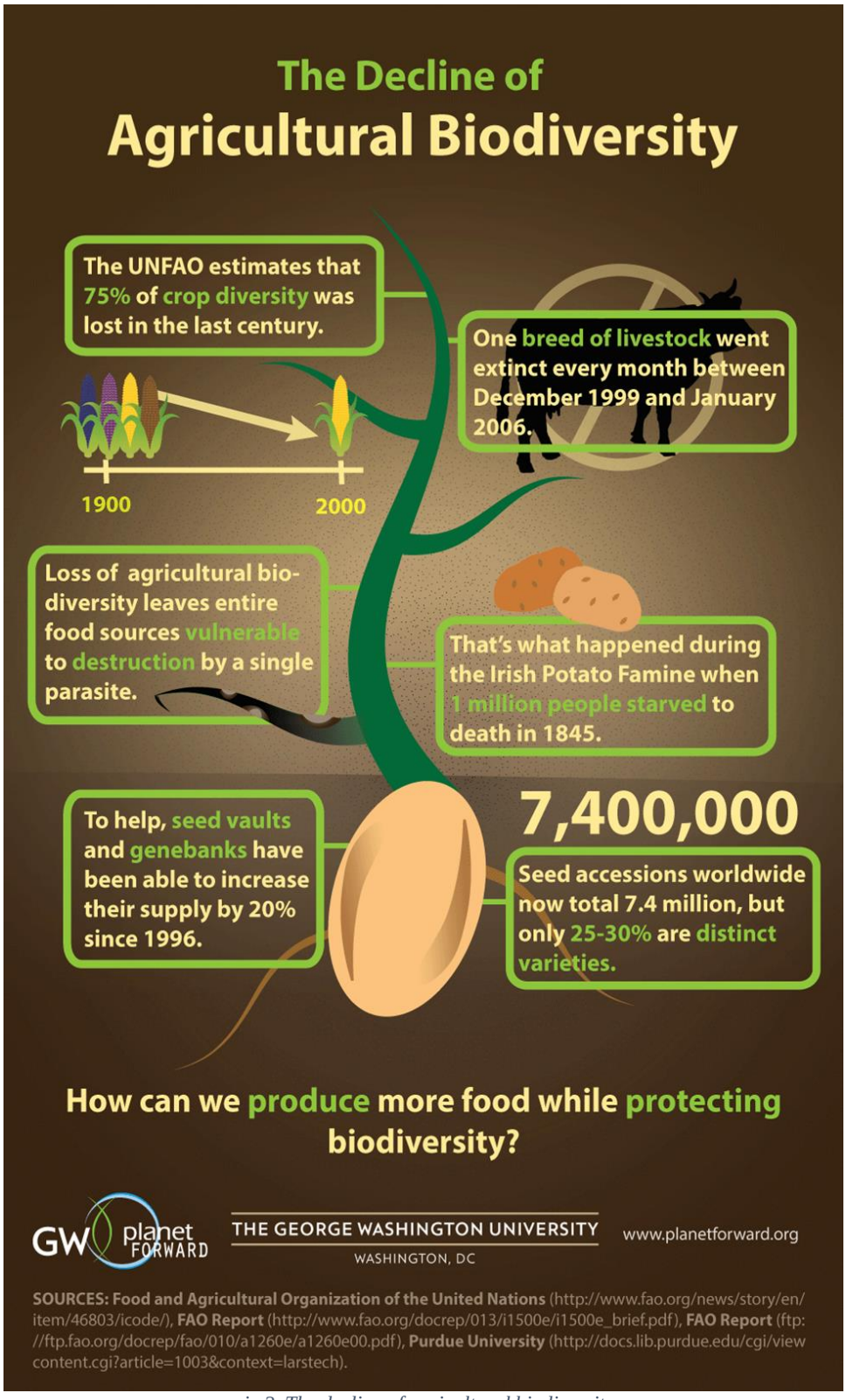
Preamble

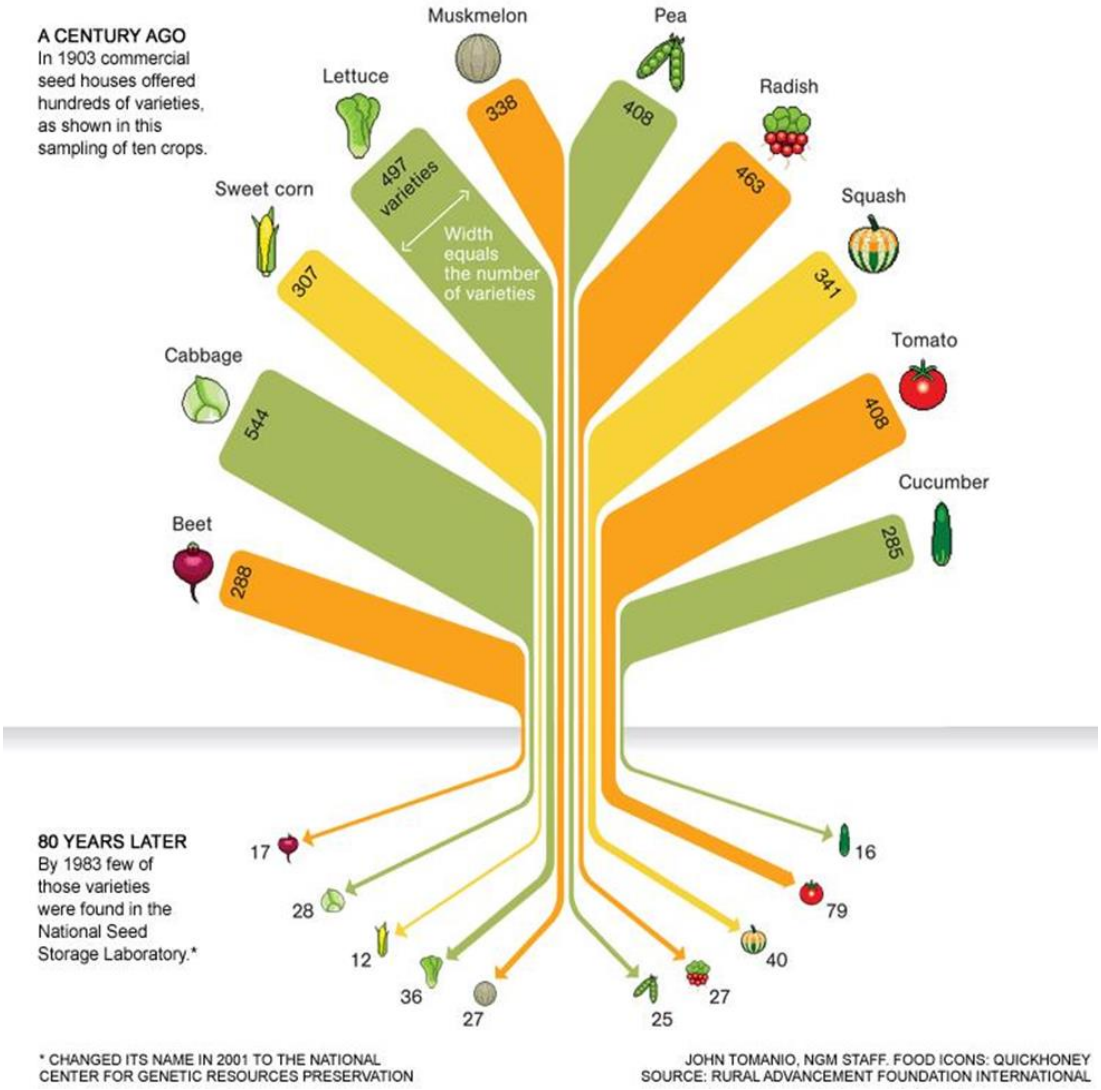
Historically, crops have always adapted to their natural and cultural environments, where big variety of local landraces create rich biocultural heritage and agrobiodiversity. This process was disrupted with industrialised agriculture where increasing produce became the target for farming.

The picture below demonstrates the overall situation with agrobiodiversity:



pic 2. The decline of agricultural biodiversity

According to the dominant view on modern agriculture (The Netherlands, etc.), the farming systems should be managed to grow crops with maximum quantity of produce. This view pushed traditional and family farmers to replace the huge number of local varieties with a few commercial, pretending to be improved, varieties. As these new varieties spread, evidenced on the markets today (e.g. hard, "woody" tomatoes with a white root wedged into the core of the fruit, which last for a long time without spoiling, with a thick, almost inedible skin, without taste or aroma). As a result, the vegetable agrobiodiversity declined. The following diagram illustrates the situation between 1903 and 1983, which, we believe, is worsened today:



pic 3. Tendency of vegetable agrobiodiversity

In most of the countries, the conventional approach was institutionalised through a seed law, saying that the certified varieties can be only commercialized, e.g. those, which are recognised by research institutes and agricultural departments of the Ministries of Agriculture. The country's cultivars laws were set, with requirements for stability, uniformity and homogeneity of the fruits and vegetables, if there would be requests to register them as protected varieties, allowed to be used by farmers for commercial purposes. Also - the farmers have to grow registered varieties, if they want to take advantage of EU or other

funding sources, which creates another obstacle for use of traditional (indigenous) varieties.

Often, the policies of the governments are strongly influenced by the economic interests of the global seed producers, e.g. Bayer, BASF, etc. (as it was the case a couple of years ago, when the EC was close to surrendering to lobbying for forbidding the use of traditional, heritage seeds for commercial vegetable farming).

In this way, contradictions appear for agricultural practices from such a regulated environment. At one hand, local varieties are genetically diverse and resilient to environmental fluctuations, on the other - it is difficult to get them for agrobiodiversity production. Commercial seed companies and seed traders are promoting and selling only modern varieties and hybrids of a small number of crops.

On the picture below, the attempt of small agri-producers to promote local vegetable varieties through food is shown:

pic 4. Small agri-producers in Bulgaria. Source: Center for Heritage Interpretation

What can we do?

Many societies and communities reacted to the situation, described above. The buyers demand, more and more, the traditional, local varieties of fruits and vegetables to be present on their tables, admitting their much better quality and taste, compared to the industrially grown.

Voices, raised for biodiversity saving and mitigating climatic challenges constantly provoke strong movements in benefit of local varieties and landraces, which are better adapted to their surrounding environments and do not require “chemical” treatment as the industrial varieties do.

That is how, people got inspired to look for seeds to grow traditional varieties.

pic 5. Planting seeds. Source: Global Biodiversity Outlook 4, 2011-2020

Many small farmers and gardeners are looking for seeds of heirloom varieties, seeing an economic reason in growing local varieties and landraces. This is how initiatives to save seeds and conserve them led to appearance of CSCs and CSBs. Their mission became to promote seed saving and using local vegetable varieties and landraces that are environmentally and culturally grounded in traditional agri practices, and enhance access

to seeds. Thus, they play a leading role in maintaining the biocultural heritage embodied in local varieties. These locally organized communities help to fill in the gap of lack of enabling policy and supportive legal environment - the greatest challenge that most community seed banks face.

pic 6.pic 7 Seed savers meeting. Source: Center for Heritage Interpretation

Production systems and seed supply

Although conservation and use of vegetable landraces in small farms and gardens is not strictly linked to a defined production system, it is more likely to find these genetic resources in home gardens and family farms, where production is dedicated to self-consumption or local markets. Organic and other non-conventional farmers often prefer to use varieties with a broader genetic base, driven by personal worldview and by their interest in plants that are agronomically more suitable for their production. Conventional farming may also involve the cultivation of diversity, especially when the market context is favourable, as in many countries of Europe, today, where there is a niche for locally produced vegetables and food products. Motivation of the farmers, availability of propagating material and market value are important factors that drive the PGR preservation nowadays and the use of landraces. These factors have to be monitored, analysed and managed:

Personal motivation of the farmers

Motivation of farmers relates to a mix of traditions, beliefs, preferences, conveniences, economic status or lack of appropriate alternative germplasm in a certain area. Knowledge of the existing motivation that assures the maintenance of genetic resources in the fields is important for development of policies and taking decisions to maintain and further encourage farmers' motivation.

Supply of seed and propagating material

Availability and access of seeds and propagating material determine preservation of on-farm genetic diversity in the farmers' lands. Observation and registration of the existing genetic diversity allows for identification of those factors which affect its continuity from generation to generation. On-farm continuous use of seeds and their exchange and/or sale contribute to maintenance of genetic diversity on the farmlands. For this to happen, seeds supply is the key. Otherwise, the genetic diversity is under a risk to disappear. Here is the major role of the CSCs and CSBs. They ease access to seeds and propagating material, to satisfy existing needs and to maintain the current, or inspire new motivations of farmers.

Observance of markets and development of markets' demand

Marketing for designing scenarios for niche market development has to take regular form. It has to lead to creation of value chains, involving community farmers, advertisers, bloggers, organisations of customers, e.g. non-governmental organizations (NGOs), commerce, etc. Special attention should be paid to messages, which should be part of captivating emotional and appealing written texts in order to inspire curiosity and grab the attention of audiences, not the customers, only. But, not with the cliché "marketing" sentences, such as "the best food", etc., but through an emotional-cognitive presentation of the worthiness of the offered vegetables and foods.

Special attention Preparing documented case studies of how these value chains have fostered a favourable market context to grow genetically diverse materials will serve as examples for similar initiatives, thereby promoting and enhancing the conservation and use of these materials.

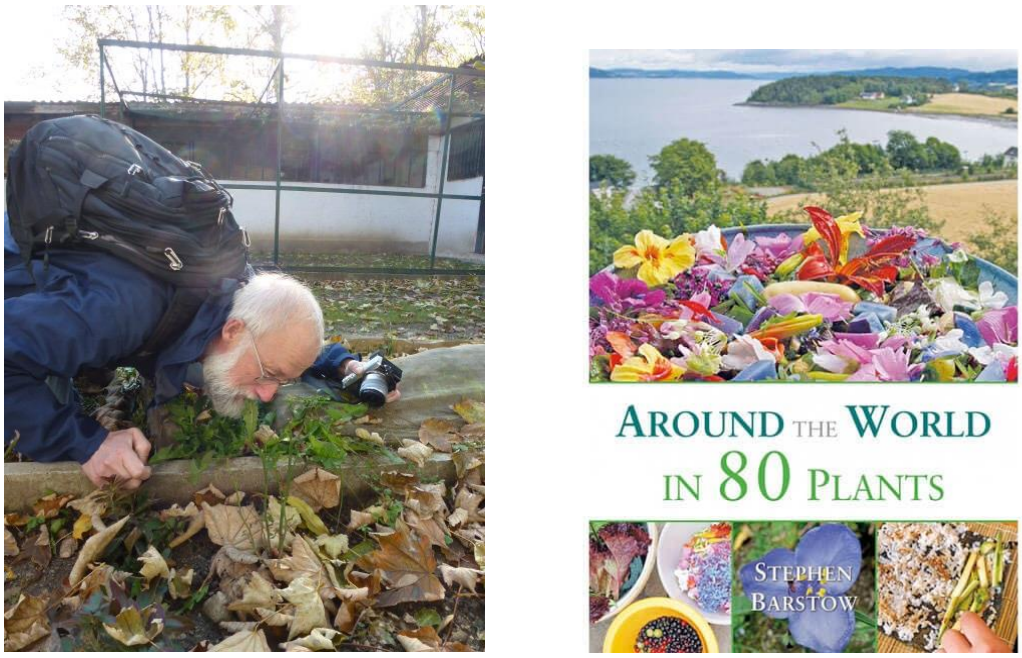
How did the CSCs and CSBs originate and develop?

Their history started in the southern part of the globe some more then 40 years ago under support of international institutions (FAO, BI). Many formats for heritage seeds' saving was experimented in Bangladesh, Brazil, Ethiopia, India, Nepal, Nicaragua, the Philippines and Zimbabwe, driven by the need to secure food for growing population and to save varieties from extinction thus preserving biodiversity of the World.

In the northern part of the globe, saving seeds took the format of seed-savers networks. Such networks were started from the 80s of the last century in Australia, Canada, the UK and the US, later spreading in other countries.

In Europe, community seed banks were rapidly appearing in the last 10-15 years. There were at least 130 initiatives as of 2017.

A strong tendency was registered in the Nordic EU countries and some others, e.g. UK, etc., to exploration of wild relatives of cultivated plants, as they are considered to contribute genetic material to the crop species, which may provide for increased disease resistance, fertility, crop yield or other desirable characteristics of domesticated plants.



pic 8. Stephen Barstow, the world known expert, author of the "Around The World in 80 Plants: An Edible Perennial Vegetable Adventure For Temperate Climates" book, observing a wild relative of a plant in his garden, during a visit of Bulgaria, Vitosha mountain, near Sofia

Key elements of the CSCs and CSBs

There is a huge variety of the ways, in which the CSCs and the CSBs are set, develop an mature in the different parts of the World. The variations are driven by the specifics of the environments they are established and operate.

Therefore, for the creation of a new CSC, "copy-paste" does not work. It is challenging to find the own way. Our advice is to study different practices, and design and probe your own model. Do not worry, if there would be pitfalls and failures, you will learn through them and will clarify and optimize your own concept.

Despite the huge variations in the CSCs and CSBs practices, they have common aspects, which can be described as their key elements:

First of all, a CSC and CSB have to have a place, where to collect, document, store, etc., the seeds and/or propagating material, and to grow the collection for conservation, maintenance and assurance of access and sharing. This is fundamental for all CSCs and

CSBs. Sometimes, this is centralized (in one place, offered by a central institution), sometimes – decentralized (seeds are kept at a place, chosen by the community).

Second, most CSCs and CSBs are locally managed by the people from the community. These structures can be informal, or registered, or acting as a cooperative (Versol company in Bulgaria, Svoge district). They are performing as non-profit, but can act as profit oriented through sale of the seeds, exceeding their needs. We personally believe, that the commercial activities of the CSCs and CSBs help to enhance the seeds utilization, at the same time helping to generate resources for promotional activities, such as taking part in festivals, fairs, etc.

Third, the members of a CSC or a CSB share common values and have common objectives, and follow rules, developed by themselves, thus establishing their own model, driven by their own culture and identity.

Within the framework of the EU project Diversifood, 85 CSBs in Europe were surveyed. Their key features were summarized through a questionnaire that cover most countries in Europe. The CSBs were categorized in three groups, on the basis of similarities and the initiatives.

The features of the Iberia Group (Spain and Portugal):

Spain is the European country with the highest number of community seed banks (29) and with a rapidly evolving movement. One CSB from Portugal was included in this group, thus arriving at a total of 30 CSBs, which have their own motivations and activities, which differ from other countries. This group represents CSBs which were established by farmers. Whereas conservation was initially the main objective for the community seed banks, the focus today is on raising awareness of the importance of crop diversity and self-sufficiency in seeds for food sovereignty, and control of the means of agricultural production.

The most important activity in the Iberia Group is seed multiplication and to make seeds and propagating material available. These CSBs have extensive interaction with gardeners, mainly with a view to enhancing the diversity of crop varieties in the collections, in order to make them more widely available.

The other group in the survey was the **Central Europe Group (France, Italy, Luxembourg and Belgium):** France is the second largest country after Spain in terms of the number of community seed banks (17) and shares common aspects regarding motivation and activities with Italy (4), Luxembourg (2) and Belgium (1). There were 24 CSBs observed in total.

As in the Iberia Group, the founders are largely local farmers. Conservation was initially a major objective, but even more important were adapting and selecting/breeding varieties and populations and producing seed. Today conservation as such is regarded as less important, compared to the importance of awareness raising, like in the Iberia Group.

The countries of the Central Europe Group focus on education and training often targeted at crop improvement and participatory plant breeding. The CSBs in this group report the highest level of interaction with producers, such as farmers and horticulturalists. They also show the highest level of interaction with breeders and scientists, aimed at improving and developing seed material. Heirloom gardeners are very important in this group of the CSBs.

The group of **Other European Countries** demonstrates similarities among CSBs in the North and West of Europe, specifically. It includes CSBs from Austria (2), Switzerland (1), Czech Republic (2), Germany (7), Denmark (1), Estonia (2), Great Britain (2), Greece (1), Croatia (1), Hungary (1), Ireland (1), Lichtenstein (1), the Netherlands (2), Portugal (4) and Sweden (1), totaling at 31 CSBs.

The specifics of the observed CSBs of this group was that they were mostly founded by gardeners or their organizations (and not farmers' groups). Conservation has remained the most important objective, although training and seed multiplication were also the core activities.

This group demonstrated the highest level of interaction with external stakeholders, such as gene banks, etc.

In a resume, in some countries the CSBs just conserve the seeds, in others – they act as commercial producers and sellers of seeds.

The first origination

So far, the role and contribution of the seed collections and banks for agrobiodiversity, climate change mitigation and food security was not enough and deservedly recognized, despite the already long history and visible and measurable results all over the globe.
The most active international organization, so far is the Aliance Bioversity International (CIAT), the Earthscan as well, providing views and concepts.
The CSBs concept dates back to 1986, when it first appeared in the literature. In 1989, the Seeds of Survival (SoS) programme was initiated in Ethiopia in cooperation with the Institute of Biodiversity Conservation. In 1992, Southeast Asia Regional Initiatives for Community Empowerment (SEARICE) set up the Community-based Native Seeds Research Centre (CONSERVE) as a non-profit organization in the Philippines, for conservation and development of crop genetic resources at community level – including collection, conservation, research, development and utilization of these resources in partnership with farmers. Latin America followed around 1992 with the Chile-based NGO Centro de Educación y Tecnología (CET), which started establishing community seed banks in several Latin American countries. Brazil also started its CSBs in the same period. These were the places where the CSBs appeared for the first time. The main goal has been to save and exchange local seeds, keeping them under the ownership of the community farmers. The CSBs differ, though in the priorities. Some are more focused on conservation, others – on availability next to conservation, and others also focus on seed and food security.

More about the context of the CSCs and CSBs

They are prevailingly voluntarily created informal institutions, self-governed, with the main function to preserve seeds for local use. Their history started approximately 30 years ago with conserving, revitalizing and supporting the existing seed systems with local varieties, but not only. The terms, used for these seed saving establishments are different. Some

people call them community gene-banks, farmer seed houses, seed huts, seed wealth centers, seed savers groups, heritage seeds networks, community seed reserve, seed library, or community seed banks.

The small local farmers and heirloom gardeners, who become members of the CSCs and the CSBs grow traditional crops, forgotten and less used species in small quantities of particular accession, or big volumes, e.g. corn, wheat, etc. The CSCs are taking seeds from producers, preserve and control them, establish cooperation among farmers, collaborate with researchers, official gene-banks, commercial agriculture, government agencies, etc., for efficient conservation and sustainable use of agrobiodiversity. The CSCs and CSBs became the formats, where local seeds of local crops and varieties can be acquired.

pic 9. pic 10 Farmers in Strandja mountain in South East Bulgaria

On the photo are farmers after a meeting with an elderly lady, deep in the Strandja mountain, Bulgaria, who kept vegetables seeds for decades! Together with Asmund Asdal, a scientist, who was part of the Svalbard vault management. When the seeds, received from the old lady and kept for years were planted, they germinated! The photo on the right shows an open air garden of the forestry directorate which produces seedlings of the unique Rhododendron ponticum of the Strandja mountain.

Commonly, the CSCs and CSBs are governed by a small group of dedicated local community representatives. They work for and with local producers. Often, they are active

outside their area and even at national level (examples: The Netherlands, Costa Rica, Brazil, etc.). Especially, when there is no access to local crop diversity and locally adapted planting materials, provided by the private or public sector.

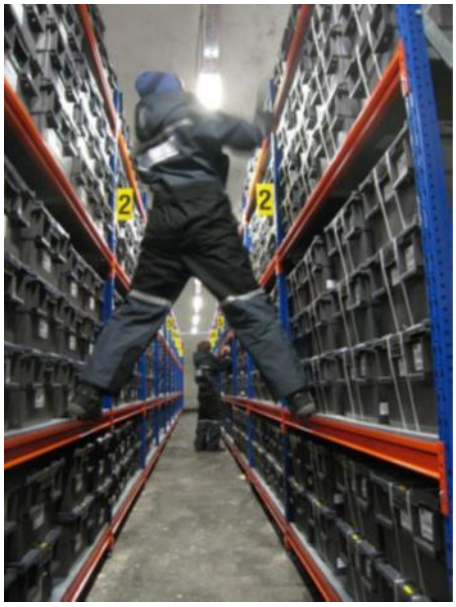
Depending on the level of self-organising and the maturity of the environment in which the CSCs and the CSBs operate, they can perform in various directions, e.g.:

- Awareness raising campaigns for various audiences, including outside the locality;
- Cooperation with local schools, training and other educational institutions for delivery of knowledge on seeds' related issues, e.g. agrobiodiversity, food, traditions and climate change, local development, etc.;
- Documentation of traditional knowledge and information – local stories and histories about varieties collected from farmers and gardeners with the help of professionals, e.g. agronomists, environmentalists, historians, biologists, etc.
- Collection, production, distribution, and exchange of seeds on-site for on-site farming;
- Sharing of knowledge and experience by organizing regular meetings, gatherings, presence at events, etc.
- Promotion of agrobiodiversity and ecology – at fairs, festivals, exhibitions, etc.
- Participatory crop improvement experiments organized on-site by local (horticulture) crops' producers and farmers;
- Income-generation for funding the activities of the members through EU funded projects, governmental or private sources;
- Networking and policy initiatives – working with policy making and decisions making levels (Ministry of Environment, Ministry of Agriculture, etc.)
- Collaboration with the national research centers, genetic banks, commercial seeds' breeders and seed traders.

Which are the main obstacles, faced by the CSCs and CSBs?

Access to traditional, local varieties is difficult for small farmers to obtain from the official seed/gene banks due to the bureaucracy, cost and intellectual property rights. The PGR, kept within the gene bank collections cannot be obtained without specific documentary steps. Next to this, the farmers, interested in particular seeds cannot receive the needed quantity. The BG gene bank can give 5 grams of tomato/pepper seeds to the farmer, requesting specific variety. In such a situation, the PGR collection of the official seed sources cannot be used efficiently.

The NordGen bank of the Nordic countries tries to develop flexible relationships with the farmers and to respond more efficiently to their needs. They provide morphological data of accessions and give advice to farmers on appropriateness of the particular variety. The NordGen also assesses the farmers' on-farm potential under different conditions. The other national gene banks proceed similarly.



pic 11. NordGen collections

pic 12. Open air preservation, testing and documentation

Professionals of the seed vaults (gene banks) suggest six measures to improve access to plant genetic resources of growers and breeders once the crops are included in the international Multilateral System (MLS) of the International Treaty (ITPGRFA), which offers the largest global exchange mechanism for plant genetic resources for food and agriculture:

1. A clear documentation system with relevant information on agronomic and other commercial properties of the crops covered by the MLS collection to be made available in accessible language and media;
2. An online system to directly request seeds, with contact data included for farmers to call in case of questions;
3. Active assistance to farmers for negotiating a Standard Material Transfer Agreement (a kind of a contract, signed by farmers, who receive seeds);
4. Establishment of straightforward payment systems that cover the costs for regeneration of the material by the gene bank, which should remain economically accessible to farmers and breeders;
5. Distribution of hardcopy catalogues that include the most promising materials and contact data to farmers and relevant organisations;
6. Increasing the number of on-farm participatory varietal validation research projects with farmers. When farmers have better access to information and seed material, which is

existing and available in seed banks, they can broaden the genetic base of their crops. The research shows that this is of interest to individual farmers and organisations who seek to diversify their farms to respond to climatic and/or economic shocks, and to strengthen the management of crop varieties by developing participatory evaluation and breeding programs.

Learning and knowledge sharing

The CSCs and CSBs formats allow for farmer based experimentation and peer learning, once they have the desired variety seeds to use them on their farmlands. This is especially useful for farmers, who are trying new varieties for new markets to enhance their production and adaptive ability.

The CSCs and CSBs formats also can assist the producers, who have lost essential knowledge about ecosystem resilience and the way that diverse, to fill in such gaps. The CSCs and CSBs are the places for sharing knowledge between farmers in order to use the PGR effectively. The knowledge sharing works best when many innovative smallholder farmers come together to experiment with new varieties, multiplying and breeding them. The learning and farmer based experimentation is to be led by the CSCs. Help from scientists, NGOs, etc. can be contributional for more resilient and sustainable farming communities.

pic 13. A walk, exploring wild relatives of cultivated vegetables

pic 14. pic 15. A salad from edible plants at the dinner

Relation of CSBs with the International Treaty of Plant Genetic Resources (PGR) for Food and Agriculture (ITPGRFA)

The core objectives of the Convention on Biological Diversity and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) are the main international documents on conservation and sustainable use of plant genetic resources. The ITPGRFA links these goals explicitly to farmers' rights in access to genetic resources. Although farmers' rights have been debated intensely at international level, their effective implementation at national level remains a major challenge. Community seed banks are good examples of effective implementation of those rights, but have received little attention in scientific literature and policy circles. There are case studies from various countries, available in literature that illustrate how this knowledge gap can be filled. We will return to this topic in another survey.

The newest concepts which can favor and benefit the CSBs **– food and regenerative tourism as promotional perspectives of the CSC's and CSBs and the ways to enhance the utilization of the heirloom vegetables and landraces.**

Regenerative tourism is a new phenomenon, defined as a practice for travelling and discovering new destinations, which goes beyond sustainable tourism.

Regenerative tourism is globally important concept. It motivates travelers to become active in making destinations better.

How can CSCs and CSCs movement benefit from the regenerative tourism movement? The answers might crystallize from the context below.

The Regenerative Tourism is shaped along the following statements:

- A practice of sustainable traveling and discovering new destinations.
- It goes beyond "helping to conserve" a destination. It aims at inspiring travelers to impact the destination positively by acting for clean environment, for a better habitat for local wildlife and for revitalizing the environment.

"Traditional tourism doesn't include regenerative practices. Its paradigm is to explore the world and discover new and exciting destinations. Traditional tourism is a standalone

sector, while regenerative one is deeply connected with many aspects such as economy, society, culture, and nature." - Marc Truyols, 09.2023.

The regenerative tourism builds on traditional tourism and adds new principles, e.g.:.

- This tourism happens in a specific ecosystem, where people, as the main actors in tourism activities are also to become guardians of the Nature;
- Admit that this tourism is an industry responsible for creating conditions for both places and people to thrive. It includes additional results, next to income, such as well-being, cultural prosperity, landscape integrity, and emotions of the locals for their places;
- The main agent of regenerative tourism is the host community. This tourism entitles communities to become stewards of local ecosystems, inspiring them to prosper together.

In a conclusion: regenerative tourism is a system that coexists with the regenerative paradigm. It enables communities and ecosystems to evolve, renew, and restore. It harmonizes with nature and results in economic, social, cultural, spiritual, and ecological developments.

There regenerative tourism is aligned with the CSCs and CSBs concepts and allows for achieving many benefits by integrating it in the CSCs and CSBs practices. Researchers tracked down the following ones:

- More resilience of ecosystems;
- Tourists can enjoy destinations for many years to come;
- Builds new attractivity for the travelers;
- Increased local support for tourism;
- Improved quality of life of local communities;
- Preserved biodcultural heritage.

Useful definitions:

CSCs and CSBs – a common definition: Community seed collections (CSCs) and community seed banks (CSBs) are locally governed and managed, collective local action institutions, whose core function is to maintain seeds for local use by the community members.

We will use the following definition of a CSC for the purposes of the current project:

A local voluntary, informal, self-governed institution with a core function to collect, keep, preserve, and exchange local and farmer-preferred seeds of vegetable crops - traditional local varieties and landraces, for sustainable agrobiodiversity, food security and mitigation of climate change negative effects.

Genetic banks: A gene bank is a type of biorepository that serves to preserve the genetic information of organisms. Gene banks are often used for storing the genetic material of species that are endangered or close to extinction. Gene banks are used for storing the genetic material of species that are endangered or close to extinction. They are an ex situ (or off site) collection of genetic material held for long-term security or/and for ease of access. The gene banks are usually organised at national level for preserving genetic resources of the particular country. The CSCs and CSBs ARE NOT part of the gene banks. The gene banks collaborate with the CSCs and CSBs, and the CSCs and the CSBs receive scientific support from the gene banks.

PGR: Plant genetic resources are the genetic material of plants, which are of value as a resource for present and future generations of people.

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