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Community biodiversity management. An analysis of Community Seed Banks in Europe

Gestão da biodiversidade comunitária. Uma análise dos Bancos Comunitários de Sementes na Europa

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Abstract. Increasing agrobiodiversity is a necessary condition for sustainability of food systems, in terms of resilience of agroecosystems and proper diet. Hand in hand with the development of a multi-actor and multi-dimensional approach to agrobiodiversity management, there has been an evolution of the ways to address it, when conceiving, analysing, promoting, running and supporting these processes. This has led to look at agrobiodiversity management as a dynamic process, centred on the role of farmers and communities (community biodiversity management). This perspective introduces new opportunities in terms of farmer empowerment and strengthening of local food systems. Within this new paradigm a key role can be played by Community Seed Banks (CSBs), as intermediate actors between *ex situ* and on farm systems, facilitating access to plant genetic resources by farmers and promoting innovation processes at local level, through participatory and decentralised plant breeding. The EU research project DIVERSIFOOD has been working on multi-actor and participatory approaches to agrobiodiversity dynamic management since 2015, focussing also on the role of CSBs in Europe and the dynamics underlying their development. This paper investigates these dynamics, analysing the processes through which these initiatives are set up by local multi-actor networks, how they function and the challenges they have to face. CSBs represent potential alternative systems to the management of seeds/varieties, but need to be recognised and supported in their role. The paper draws on the empirical material provided by a survey of 84 initiatives and on the results of two workshops with representatives of the initiatives.

Keywords: Agrobiodiversity, On farm biodiversity management, Community Biodiversity Management, Community Seed Banks.

Introduction

Increasing agrobiodiversity is a necessary condition for sustainability of food systems, in terms of resilience of agroecosystems and proper diet. Embedding diversity in farming and food systems however is a complex process. It builds on the interaction among multiple actors, diversely involved in the process at different scales, from the local systems, to the regional interactions among production systems and with public authorities, to even broader arenas where policies are defined and further forms of coordination may develop. The reorganisation of farming systems and value chains over the values of agrobiodiversity furthermore involves different aspects, of technical, organisational, cultural, social, economic, institutional and legal nature.

The importance acquired by this multi-actor and multi-dimensional approach to agrobiodiversity management mirrors the evolution of the ways to address it, when conceiving, analysing, promoting, running and supporting these processes, namely in



Third Internacional Conference
**AGRICULTURE AND FOOD
IN AN URBANIZING SOCIETY**

17 - 21 SEPTEMBER 2018 | PORTO ALEGRE | BRAZIL



activities of research, advisory and facilitation. Indeed, the paradigm in tackling genetic resources has been evolving from specialization and concentration, with a dominant role of science in designing research, limited number of objectives and direct management of experimentations in dedicated centres, to participation, decentralization and an overall view of the components involved. In practical terms, this has led to look at agrobiodiversity management as a diversified and dynamic process, located in its natural environment - the farm - and embedded in its social context. This approach re-empower farmers, giving them a key role in the management of seeds and varieties in local farming systems, but also reintroduces a collective, social dimension in agrobiodiversity management, looking at the role of the whole communities (Community Biodiversity Management - CBM) (De Boef et al., 2013). This perspective creates new opportunities to embed the values of agrobiodiversity in the local food systems.

Within this new paradigm a key role can be played by Community Seed Banks (CSBs). They refer to a locally governed and managed, mostly informal, institution whose core function is to maintain and circulate seeds for local use. They are considered to contribute importantly to the global genetic heritage by conserving and making available an impressive range of crop varieties and populations that may else have been lost (Vernooy et al., 2015; Andersen et al., 2018). CSBs work as intermediate actors between ex situ and on farm systems of agrobiodiversity management: they maintain plant genetic diversity and provide access for farmers who cannot find what they need in the formal seed sector, as well as promote innovation processes around agrobiodiversity management at local level. As such, they are a full expression of multi-actor and participatory approaches to agrobiodiversity dynamic management. The EU research project DIVERSIFOOD (Horizon 2020 – www.diversifood.eu) has been working on this kind of initiatives/processes since 2015. Among the various activities, the project focused also on the role of CSBs in Europe and the dynamics underlying their development. Drawing on the findings of those research activities, this paper investigates these dynamics, analysing the processes through which these initiatives are set up by local multi-actor networks and how they function. Its aim is exploring the innovative features of CSBs in the management of seeds/varieties, their potential to trigger changes in the mainstream conservation paradigm, but also the challenges they have to face. All this may provide useful insights to the fine-tuning of suitable forms of support and the creation of conducive legislation and policies, which indeed represent another important aim of the DIVERSIFOOD Project.

The analytical framework

DIVERSIFOOD devoted one work-package to the study of seed systems, with a special focus on the so-called informal seed systems and their different components. This WP – Innovative Biodiversity Management – has studied and promoted the development of new approaches to on-farm management of plant genetic resources, replacing the concept of *in situ/on-farm* conservation. On-farm management has been considered more suitable to the dynamic utilization of plant genetic resources within farmers' communities, as stated also by the FAO First Report of the State of the World's PGRFA (Plant Genetic Resources for Food and Agriculture). DIVERSIFOOD has analysed the potential and the bottlenecks of on-farm management in Europe, clarifying the links between formal and informal seed systems, identifying the key elements to reinforce the capacity of networks or communities, analysing



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17 - 21 SEPTEMBER 2018 | PORTO ALEGRE | BRAZIL

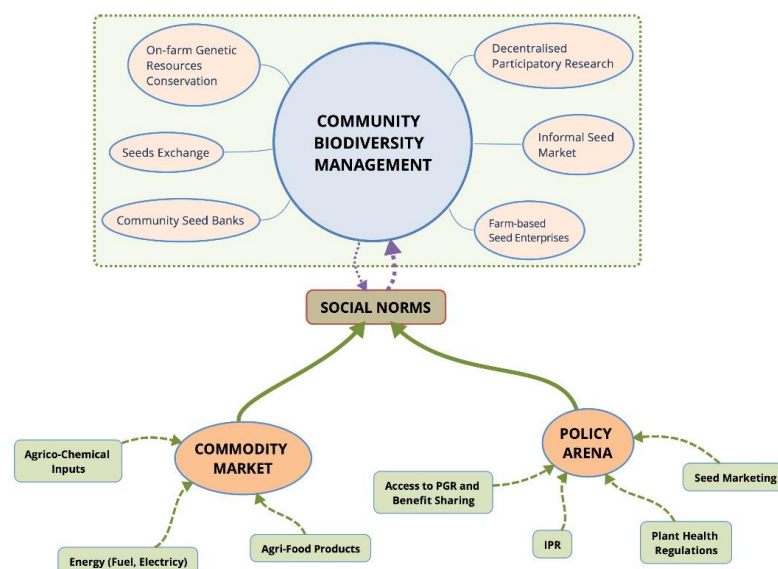


the impact of CSBs in Europe and increasing the awareness of the society on the value and non-use value of plant genetic resources. The analysis of the legal issues associated to this management pattern has been also important, with the aim to highlight the conditions needed for the creation of an enabling environment.

In this framework, DIVERSIFOOD has focussed on the word “community” as a key element of on-farm management strategies. Communities, and in general social aspects and norms, play an important role in establishing and shaping seed systems at local level and in their integration with local food systems. The concept of CBM, putting farming communities at the centre of the sustainable use of agrobiodiversity (De Boef et al., 2013), mirrors this particular perspective. CBM, from the collective breeding to the organisation of new, localized systems for seed reproduction and circulation, does represents an area of experimentation of innovative practices. These imply the definition of common objectives, in turn based on sharing of values and knowledge, and the definition of new collective rules and social norms to handle all the practical aspects associated to variety and seed management. As such, this approach shows a significant innovation potential, being able to trigger broader change in the approach to genetic improvement and seed management. The adoption of this approach also allows showing how supporting community institutions and strengthening their capabilities is of paramount importance to the sustainable use of PGRFA.

DIVERSIFOOD project has explored the application of the CBM approach in Europe, learning from existing experiences of multi-actor networks/organisations working at local level, and understanding how the policy and legal environment can impact on the local systems (see Fig. 1). This approach can include different activities and ways of managing diversity: community seed banks, participatory plant breeding projects, seed companies and cooperatives, landraces conservation, seed exchanges and fairs. All these activities can be considered part of the so-called informal and formal seed systems.

Figure 1 – Community Biodiversity Management and the policy environment



Source: Bocci (2017)



Third International Conference
**AGRICULTURE AND FOOD
IN AN URBANIZING SOCIETY**

17 - 21 SEPTEMBER 2018 | PORTO ALEGRE | BRAZIL



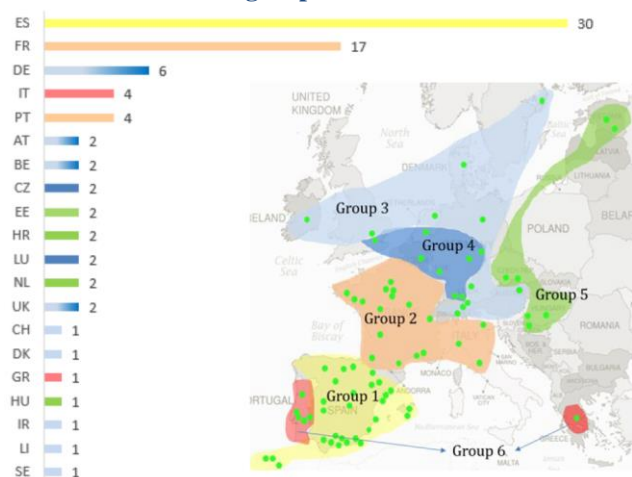
Among these systems DIVERSIFOOD has analysed features and roles of CSBs, in this way contributing to shed light on a little-known reality. In recent year, in fact, several case studies and analyses on CSBs worldwide have been published (first of all the book “Community Seed Banks – Origin, Evolution and Prospects” from Bioversity International). However, most of them focus on examples from the Global South, where these initiatives emerged first, whilst very little has been published on experiences from European countries.

DIVERSIFOOD has considered CSBs as collective platforms that can facilitate access to plant genetic resources, multiply seeds, promote seed exchange and maintenance (Réseau Semences Paysannes, 2014; Vernooij et al., 2015; Andersen et al., 2018; Koller et al., 2018). As intermediate actors between *ex situ* (gene banks) and on-farm systems, they can promote innovation processes in agrobiodiversity management at local level, creating synergies with participatory and decentralised plant breeding (Ceccarelli et al., 2009). They are generally spaces that allow a not for profit community management of agrobiodiversity, closely integrated with local food systems and often strongly aimed at food sovereignty goals (Sthapit 2013). For all this, CSBs are considered as significantly instrumental to actualise the objectives of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), namely the objectives of facilitating conservation and sustainable use of PGRFA and the fair and equitable sharing of benefits derived from their use (Andersen et al., 2018).

Empirical material and analyses conducted

The paper draws on the empirical material gathered within DIVERSIFOOD project. Within it, a mapping and a survey on CSBs in Europe were carried out, comparing their history, objectives and structures (Koller et al., 2018) (see www.communityseedbanks.org). The survey was conducted between May 2016 and July 2017. 84 initiatives contributed to it, from 20 European countries (with the largest numbers of answers coming from Spain and France, followed by Germany, Italy and Portugal). The answers of all initiatives were clustered in six groups (Fig. 2).

Figure 2 - Initiatives that participated in the survey, from 20 European countries, clustered in 6 groups



Source: Koller et al. (2018)



Third Internacional Conference
**AGRICULTURE AND FOOD
IN AN URBANIZING SOCIETY**

17 - 21 SEPTEMBER 2018 | PORTO ALEGRE | BRAZIL



The findings of the study were presented and discussed in September 2017 in two workshops in Rome. These two events also provided useful insights to the analysis.

The first workshop on September 21st aimed at stimulating an in-depth exchange and discussion on different aspects of CSBs worldwide, through a dialogue between CSB initiatives from all over the world, partners from DIVERSIFOOD project, initiatives involved in the survey and representatives of Bioversity International. It gathered about 57 participants (42 being representatives of CSB initiatives) from 23 European and non-European countries. The participants were asked to develop a SWOT analysis on six different objectives of CSBs extracted from the CSBs survey results: conservation – biodiversity management; access and availability; sensitisation; training and capacity building; sustainable use – experimentation; advocacy – legal advice. The aim was to exchange and gather ideas on how to strengthen CSBs and discuss strategies on how to overcome the identified weaknesses and threats.

The outcomes of the workshop also served as an input for the second workshop, held on September 22nd at the FAO Headquarters. This was planned as a dialogue forum with participation of CSB initiatives from all over the world, with representatives from the International Treaty on PGRFA, Bioversity International and DIVERSIFOOD project, the research sector and civil society.

Results and discussion

The survey

The beginnings of the CSB movement in Europe date back to the late 1970s and early 1980s (Andersen et al., 2018). The real growth however started after 2000, after 2005 in particular, at least in some European regions (as emerged from the survey). It is difficult to make a reliable estimation on actual numbers; anyway, it seems that in 2017 there are at least 135 initiatives. For many reasons the survey grasped only a part of these initiatives.

The results of the survey (Koller et al., 2018) show the great diversity of the CSB movement in Europe with regard to the age of the initiatives (from 0 to 42 years), their size (from 100 to 10,000 seed samples managed), legal status, stakeholder groups, areas and activities, and internal structures (infrastructure, manpower, governance). It also indicates different approaches to the concept of conservation of agricultural biodiversity versus the more evolutionary concept of “dynamic management” of plant genetic resources.

Differently from what happened in countries of the Global South, where international NGOs or governmental institutions played an important role in initiating or setting up CSBs (Vernooy et al., 2015), the CSB in Europe root directly in citizens’ initiatives, sometimes using existing examples as role models. In turn, the differences among CSBs in Europe can be explained by the fact that most CSBs have emerged locally from grassroots initiatives. Different role models like older CSBs in Europe, the seed savers in the USA and Australia, or social movements in Latin America were adapted and developed by CSBs according to their local conditions. Other reasons for those differences were discussed during the CSB workshop in Rome. An important factor was identified in the kind of national developments of agriculture sectors and agro-food systems, determining different needs for change and motivations for agrobiodiversity conservation-enrichment (ranging between environmental concerns to farming autonomy and food-sovereignty).



Third Internacional Conference
**AGRICULTURE AND FOOD
IN AN URBANIZING SOCIETY**

17 - 21 SEPTEMBER 2018 | PORTO ALEGRE | BRAZIL



Despite these differences, however, CSBs in Europe seem to share certain aspects, which may be considered as key elements describing these initiatives. First, a CSB normally have a place to store seeds and/or propagating material or to grow plant collections in order to conserve, maintain and make available seeds and/or propagating material. Second, most CSBs are jointly managed by the people involved, whether as an informal network or a registered organization or a cooperative. Further, they usually work on a non-profit basis, and are normally part of the informal or semi-informal seed system, often with roots in civil society. Finally, the CSB members usually follow joint objectives, based on shared values and rules, thereby often creating their own culture and identity.

Roles and concepts of European CSBs can be roughly described by keywords such as "diversity", "conservation", "exchange", "community" and "sovereignty", though their exact meaning has not been collectively defined and might differ between initiatives. The presence of an evolution of the objectives of the initiatives since their foundation is also very significant, showing a progressive growth in awareness and evolution towards an active role in the agrobiodiversity management: no more only crop conservation, but also crop improvement and adaption (through participatory plant breeding), sensitisation, training, promotion on local markets, connection with local food systems, networking with other likeminded initiatives, political advocacy. The evolution of fields of activities (or goals of) mirrors the main achievements that the CSBs recognise: training, education and awareness-raising, as well as involvement and participation, plant breeding, political advocacy.

Initiatives were furthermore asked what they consider as main obstacles to their activity and strengths to overcome these obstacles. With regard to the former, the answers show a quite homogeneous picture: lack of financial resources as major barrier for most initiatives, lack of manpower (probably for the smallest initiatives), limitations from the legal environment, lack of technical resources, and lack of land.

As far as strengths are concerned, the answers show that the enthusiasm, the engagement and the endurance of the people involved are considered very important, as well as the shared visions and values, the feeling of group power and collective action. Solidarity and friendship are central values. Successful awareness raising and the resulting public acceptance of CSB aims and activities is considered supportive. In addition, some initiatives mention the good contacts with the media, state/public bodies and other networks and organizations as important strengths.

Figure 3 - "What do you consider the greatest strengths to overcome the barriers you face?"

- *enthusiasm - engagement - endurance - volunteers*
- *group power - a common vision and values - collective action - solidarity - friendship*
- *great & growing acceptance & sensitisation of the public - being well known*
- *good contacts with media, public bodies, cooperation other networks and organisations*
- *the ability to improvise - to be flexible - being free and no bureaucracy - being resilient*
- *to be local - to be small - local production*
- *the people that need and use our seeds, people that want to join*
- *the bad quality of products on the market / the quality of our products*
- *(also social) diversity*
- *presence of a tradition with our products, knowledge about tradition*

Source: Koller et al., 2018



Third International Conference
**AGRICULTURE AND FOOD
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17 - 21 SEPTEMBER 2018 | PORTO ALEGRE | BRAZIL



The SWOT analysis

Other significant insights have come from the exercise done during the first workshop, in which the participants were asked to develop a SWOT analysis aimed at discussing the features of CSBs (strengths and weaknesses) and defining strategies to strengthen them, overcoming the identified weaknesses and threats and taking advantage of opportunities. The collective definition of each of the six objectives extracted from the survey and the SWOT analysis have provided useful insights. The results of the work on each objective are summarised below, followed by some preliminary conclusions (Andersen in Koller et al., 2018).

1. Conservation → conserving genetic resources and knowledge for future generations in an integrative, dynamic, and evolutionary way

An important strength of CSBs in this context is their ability to conserve a wider diversity of genetic resources compared to individual or household seed collections. A central weakness is CSB lack of technical means and support for this work. Among the most central opportunities is the rising demand for sustainable (and local) food, which may generate attention to the work of CSBs. A major threat is the loss of human resources and knowledge in CSBs due to heavy workload for volunteers and/or age. Selected strategies comprise: 1) include new stakeholders from the food chain to support the work of CSBs with different capacities and to contribute to convey the meaning of this work; 2) share knowledge and recognize those who do the work; 3) implement Farmers' Rights as set out in the ITPGRFA; and 4) raise awareness about the importance of supporting CSBs financially at a long-term basis.

2. Access and availability → making genetic resources accessible and available is a core activity of CSBs

The collective action to make genetic resources accessible and available results the main strength of CSBs. A weakness is that there is no remuneration, and the work relies on voluntary engagement, which makes it vulnerable. An important opportunity is the increased international networking that provides opportunities for making more diversity accessible and available. A possible, serious threat is farmers' demotivation due to heavy workload and lacking support. Selected strategies comprise: 1) develop new cooperation forms and strengthen ties with formal gene banks; 2) engage in participatory research to strengthen the work of CSBs; 3) work through existing networks and organizations to disseminate information and attract funding.

3. Sensitisation → promoting a change of thinking and practices among farmers, consumers, civil society and policy makers that reflects the importance of crop genetic resources for food sovereignty and cultural identity

An important strength is CSB ability to establish links between genetic resources, cultural identity and food production. A weakness is that there is little documentation of the knowledge related to crop varieties, and that communication skills are lacking. An opportunity is that mass-media provides opportunities of communication and mobilization on these issues, but a threat is that the action needed requires resources that are difficult to mobilise due to lacking support from political authorities. Selected strategies comprise: 1) use good narratives to reach out to mass-media, civil society and other groups to achieve



Third Internacional Conference
**AGRICULTURE AND FOOD
IN AN URBANIZING SOCIETY**

17 - 21 SEPTEMBER 2018 | PORTO ALEGRE | BRAZIL



credibility; 2) create linkages between rural and urban groups and invite broadly, to attract support and work capacity; and 3) create a common platform for sharing knowledge.

4. *Training and capacity building → facilitating training to important stakeholders (farmers, gardeners, researchers) to enhance the multiple functions of CSBs and capacities of their members*

Strength of CSBs is that their actors hold very practical, hands-on relevant knowledge on the material they conserve. A weakness is the shortage of funds and human resources to conduct training and capacity building. An important opportunity is the increasing interest in integrating formal and informal knowledge: CSBs provide possibilities for bridging these two worlds, developing and testing new ways of learning and training. The major threat is the weak institutionalization of CSBs, which may lead to uneven and not constant funding. As training and capacity building are long term strategies, the lack of steady funding constitutes a barrier. Selected strategies comprise: 1) conduct multi-actor meetings to define learning goals; 2) map existing training materials and resources to save funds by not duplicating efforts; 3) map experts and farmers willing to become trainers; 4) develop on-line training moduls for wide outreach; and 5) use creative self-financing strategies.

5. *Sustainable use → supporting farmers, gardeners and small-scale breeders to utilize genetic resources in a sustainable manner*

Among the strengths is the diversity of models among CSBs, showing multiple ways of sustaining crop diversity. So far it is considered a weakness that participatory plant breeding is not sufficiently institutionalized to contribute according to its potentials. Climate change is changing the agricultural context, making the importance of sustainable use of crop diversity more visible; in this context, this can be considered an opportunity. The most important threats are the loss of farmers and agricultural land, combined with the lack of policy support and financial resources. Selected strategies comprise: 1) use the demand for food quality and local products as a leverage to increase public attention to the importance of sustainable use of crop diversity; and 2) create platforms for and with farmers aimed at adding value to their production and reducing the risk of losing crop diversity as well as farmers.

6. *Advocacy and legal advice → advocating for legal space to save, use, develop, exchange and sell their seeds*

A major strength is the fact that CSBs provide good examples of the need for legal space related to the management of seeds. A central weakness is the lack of economic resources and human capacity to engage in advocacy work. The most important opportunity is that potentially there is massive support from the public in this regard. The major threat is considered that opponents of legal space for CSBs and their work on seeds are strong and numerous. Selected strategies comprise: 1) use public support for just demands of CSBs to put pressure on national authorities to comply with their commitments related to the ITPGRFA; 2) demand representation of CSBs in relevant decision-making bodies; and 3) pool human resources to provide advice to CSBs on regional and national policy processes.

Summing up, the SWOT analysis first showed, through the discussion and articulated definitions of the CSB objectives, the richness of potential assigned to these initiatives. Moreover, it pointed out that, despite the shortcomings CSBs show, the CSB specific mission



Third Internacional Conference
**AGRICULTURE AND FOOD
IN AN URBANIZING SOCIETY**

17 - 21 SEPTEMBER 2018 | PORTO ALEGRE | BRAZIL



and work done find many opportunities to strengthen and grow, especially coming from civil society and part of the research sector. The strategies identified show the importance assigned to cooperating with other similar initiatives, creating alliances with civil society to strengthen the consensus around CSB role, and advocating a legal recognition and a public support for their activity of conservation and sustainable use of crop genetic diversity. This last aspect is crucial to the implementation of the ITPGRFA.

Conclusions

The studies carried out show as main result the great diversity of CSB initiatives in Europe, thereby confirming the considerable variability highlighted in the performance of CSBs, in terms of technical and operational capacities, governance and operational management, around the world (Vernooy, 2018). Different triggers were at the basis of their foundation, different role-models resulted in different aims and approaches, social structures and thematic scopes. This variability is however consistent with their nature of grassroots innovations, embedded in the territorial contexts and thus linked to their specific resources. On the other hand, the study has shown the existence of common key elements.

Studying CSB characteristics can trigger reflection and learning, helping to develop a better understanding of existing differences, of their origin and of their potentials. This could serve as an input in defining ways to support the CSBs in their further development. In this regard, the preliminary achievements from the DIVERSIFOOD studies should be deepened as well as what they have just shown could be complemented through additional, in depth investigations.

At the same time, CSBs appear as dynamic social structures, which will develop further, making a continuous observation needed. We have already seen this when comparing the “aims at foundation” and the “today’s aims”. Today, society as a whole faces big challenges - climate change, increasing food needs, and consequent need of sustainably farming/food systems. CSBs could contribute to find answers to these challenges - how can they become sustainable and resilient systems to do that? and what shall be their specific contribution to the society as a whole? As emerged from the SWOT analysis, the answers to these questions will however depend on the concrete socio-economic, institutional-legal and natural environments they are situated in. Furthermore, one size does not fit all, existing models will change and new models will emerge, and adaptable and suitable models will have to be found for the diverse situations.

However, CSBs in Europe have already done a very good job. They succeeded in multiple areas: in raising public awareness on the importance of crop/seed diversity and also on the possibility/necessity of a dynamic management of this diversity; in concretely safeguarding local varieties and bringing them back into use; in adapting these varieties to current needs, both in farming and consumption; in capacity building, through recovering knowledge, skills and organisational abilities; in creating solutions for practical problems and in sharing and disseminating these achievements, thereby facilitating the consolidation of these initiatives; in developing collective agency to manage what is increasingly considered as a common good. Thereby they are already contributing to make our food system more sustainable and our society more resilient and better prepared for the challenges to face.

The further challenge is now to support this grassroots innovation, by creating an environment enabling the full expression of its potential. This requires a public recognition of



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**AGRICULTURE AND FOOD
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17 - 21 SEPTEMBER 2018 | PORTO ALEGRE | BRAZIL



CSB action, as part of the informal seed systems in Europe, and the translation of this legitimization in conducive legislation and policies, allowing the strengthening of these initiatives and their positive impact.

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