



Policies recommendations: set of recommendations on farm conservation strategy, the role of innovative market mechanisms, legislative framework for landraces, conservation varieties and amateur varieties in Europe

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FarmSeedOpportunities

Opportunities for farm seed conservation, breeding and production

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Policy recommendations

Set of recommendations on farm conservation strategy, the role of innovative market mechanisms, legislative framework for landraces, conservation varieties and amateur varieties in Europe.

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Aim of the document: to facilitate the discussions with experts about regulation for seed in Europe

Objective written in the last point of the DoW abstract:

Farm Seed Opportunities will provide several regulations scenarios to cover most of the described situations in Europe according to the market, the farmers and the breeders needs and rights taking in account the experimental data about the status of the varieties and the seed qualities. These scenarios, from the adaptation of the current DUS regulation to the proposition of new legislations, will necessarily reflect the diversity of the varieties, their use and breeding methods.

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1. Summary

When Farm Seed Opportunities (FSO) started its research activities in 2007, EU policy makers were facing the problem of defining the rules for the implementation of the directive 98/95/CE on conservation varieties. During FSO three years of activities, two new directives have been published defining the implementing rules on conservation varieties for agricultural crops (2008/62/CE) and vegetables (2009/145/CE).

Meanwhile FSO has performed several studies and analysis to precise the concepts behind the “conservation varieties” regulations, to verify the situation in European’s fields and to suggest further development of these regulations aiming at preserving plant genetic resources. All these data could be useful for the national implementation of the new directives that leave enough space to each member states for adapting these directives to their farming conditions.

Through these studies, FSO identified several situations that are not already taken into account by seed laws, mainly (i) for varieties still cultivated in the so called alternative farming systems or for niche markets and (ii) for new populations recently created in the framework of Participatory Plant Breeding or by innovative breeding methods favouring plant diversity inside the variety. These varieties have a great potential use also for coping climate change in the next future and therefore it is important to find a legal space for their commercialisation or allowing their cultivation, easing their use in farming systems.

2. Introduction

Seed has many roles and functions in agriculture and, according to the different points of view, their relative importance changes. It has embedded specific traits contained in its genetic information (as shown by the term “genetic resource” used often as synonymous), it is an economic commodity traded at international level, but it has also an ethic value linking culture and food habits. Finally, seed is a key player in the modernization process as shown by the history of Green Revolution (Louwaars, 2007).

Since the beginning of the '80, seed has also had an important role in the North South negotiations, and its legal status has dramatically changed in the last 30 years. From being a public domain resource heritage of humankind to a private one owned by States or private

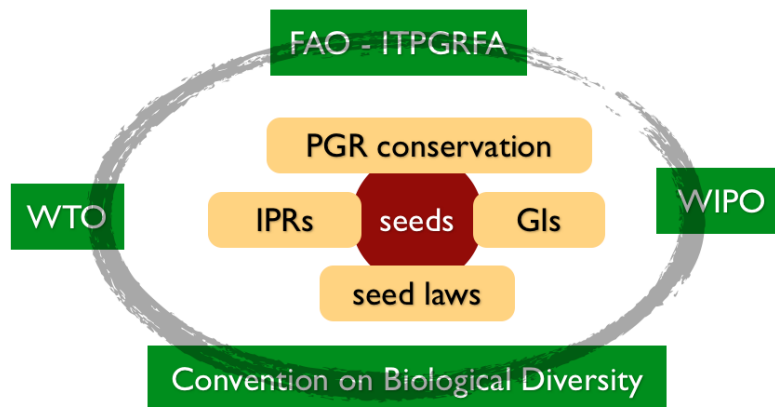
company and patented too. Actually, agricultural biodiversity is one of the most hotly debated issues at international level in terms of access to genetic resources and their ownership.

Much has changed since the early 1980s when the seed issue began to be raised vehemently within FAO by a number of governments of the south of the world (Fowler & Mooney, 1990). The Convention on Biological Diversity (CBD) came into force in 1994 and every biological resource, seed included, which up to then had been considered freely accessible to all as part of the common heritage of mankind, or *res nullius* according to the point of view, became the property of the states where their origin lay. In 2004, exactly ten years later, the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) came into being to keep up with the specificity of agricultural diversity. While recognising state sovereignty it created a sort of shared space in which seed could be exchanged for research, and, in the quest for a difficult and delicate equilibrium between plant breeders' rights (PBR) and farmers' rights (FR), automatic mechanisms could be activated to share the benefits deriving from their use (Tansey & Rajotte, 2007). In the meantime, consequent to the expansion of the patent model enshrined in the 1994 Agreement on Trade-Related Aspects of Intellectual Property (TRIPS) within the World Trade Organization (WTO) increasingly stricter rules were being affirmed in intellectual property rights to biology, bio-technology and agriculture (Drahos & Braithwaite, 2003). The UPOV system, the only *sui generis* alternative to the seed patent model that had been accepted *de facto* by the WTO, progressively extended protection to innovators with the amendments introduced in 1978 and 1991, limiting the circulation of genetic resources for research (breeder exemption) and curtailing the so-called farmers' privilege¹ (GRAIN, 2007).

The impact on seed production, multiplication and marketing has been enormous and now different International Agreements regulate different aspects related to seed: plant genetic conservation, seed marketing, intellectual property rights and protection of traditional knowledge associated (see figure 1). Finding a balance between them is not always easy.

¹ It should be noted that in EU protection of Intellectual Property Rights are based on UPOV rules, providing free access for further breeding and not allowing double protection on plant varieties (i.e. patent and PBRs). Moreover, EU member states have dealt with farmers' privilege in different ways recognizing it or not.

Figure 1: The PGR negotiations web



FSO partners have participated to the two last sessions of the Governing Body of the Treaty (Rome in 2007 and Tunis in 2009), the last two sessions of the Commission on Plant Genetic Resources within the FAO (Rome in 2007 and 2009), the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) meeting (Rome in 2008), and to the Conferences on the Parties (COP) 9 of the CBD in Bonn in 2009. We have experienced that article 6 (Sustainable use of plant genetic resources) and 9 (Farmers' rights) of the ITPGRFA are not in the agenda of European countries, which seem only interested on facilitated access through the multilateral system to PGR. It could be proved by limited number of countries that sent their submission to the Secretary of the Treaty on article 6 and 9 (see the documents "Compilation of Submissions Sent by Contracting Parties, Other Governments, and Relevant Institutions and Organizations on the Implementation of Article 6" and "Collection of Views and Experiences Submitted by Contracting Parties and Other Relevant Organizations on the Implementation of Article 9", <http://www.planttreaty.org/>). Only Italy and Germany sent their submission on both the articles and France only on the article 9 on Farmers' rights.

In the run-up to next Governing Body in 2011, however, a compilation on Article 6 implementation has been prepared that contained information from many European MS (EE, DE, FI, FR, EI, HU, IT, NL, PL, PT, SE). It has not been sent in electronic format and hence it is not featuring on the ITPGRFA website. It should be mentioned that as far as bringing in of collections into the Multilateral system is concerned, the EU Countries in general are among the most advanced.

At the same time, many farmers' associations and organisations claimed for a full implementation of these Treaties in Europe too (see for example the declaration of Via Campesina during the GoB in Tunis, available on <ftp://ftp.fao.org/ag/agp/planttreaty/gb3/gb3i06a1e.pdf>).

3. Seed laws and agriculture modernization

Seed laws and policies have been conceived to maintain the identity and purity of the new crop varieties and guarantee seed quality to the consumers. The process for registration, testing, certification and labelling of varieties had been regulated at national level mainly in the beginning of the 20th Century. To facilitate trade, international rules have been adopted. All the process of registration, testing, release and certification of new varieties has been standardised mainly in America following the rules established by the International Crop Improvement Association (now the Association of Official Seed Certifying Agencies – AOSCA, www.aosca.org). The International Seed Testing Association (ISTA) set out rules on sampling and testing and the Organization for Economic Co-operation and Development (OECD, www.oecd.org) set out rules for certification of seed and propagating material. The European Union has adopted rules since 1966 as regards the listing of varieties including - for agricultural crop - their value for cultivation and use. This system has been codified in the mandatory registration of varieties to the official catalogue in order to be marketed. So they have to follow registration (i.e. meet the DUS requirements – Distinctness, Uniformity and Stability) and performance testing (i.e. on at least one out of the four basic elements mentioned in Directive 2003/90/EC they must have a superior value for cultivation and use - VCU- for agricultural species). Elsewhere, access to seed for research has been codified following the rules of UPOV, creating a soft system of intellectual property rights, the plant breeders' rights (PBRs). In both systems varieties have to be distinct, uniform and stable, but in order to claim PBR on a variety it should also be novel. That is the way seed has been regulated in industrialised countries, seen as a key for agriculture modernisation (figure 2).

This framework is based on the assumptions that seed systems follow a natural development pathway from farmers' production through government involvement towards a perfectly competitive private seed market, according to the seed system development paradigm published by Douglas in 1980 (Louwaars, 2007). As showed by many scholars, FSO

will point out that this model is only appropriate for a specific share of farmers with a strong commercial orientation (Lipper *et al.*, 2010).

Figure 2: Seed and modernisation



Variety

"An agricultural unit created and maintained by man, the first essential being that it should have an individuality, which can be reproduced over a number of years, and secondly that it should be distinguishable by inherited morphological or physiological characters from other varieties". (Bishaw and van Gastel, 2009)

"A plant grouping within a single botanical taxon of the lowest known rank, which grouping, irrespective of whether the conditions for the grant of a breeder's right are fully met, can be (i) defined by the expression of the characteristics resulting from a given genotype or combination of genotypes, (ii) distinguished from any other plant grouping by the expression of at least one of the said characteristics and (iii) considered as a unit with regard to its suitability for being propagated unchanged". UPOV Convention (Article 1(vi))

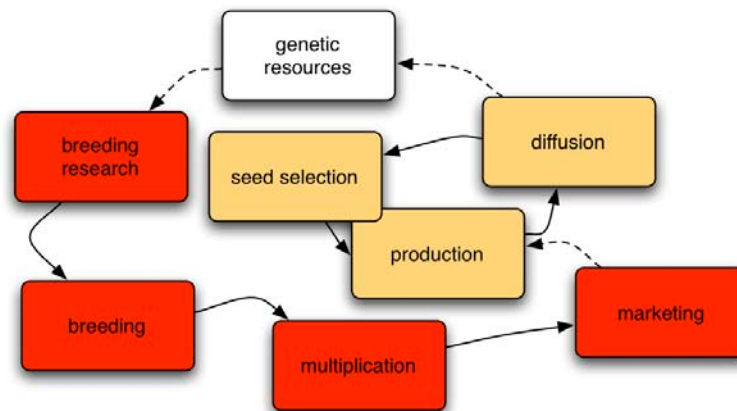
4. Formal and informal seed systems

Scholars recognize two distinctive and interacting seed supply systems in agriculture: the formal and the informal sectors (Bishaw and van Gastel, 2009). The former is characterised by the following stages:

- Variety development, evaluation, registration and release;
- Seed production, processing and storage;
- Seed marketing and distribution;
- Seed quality testing.

The latter depends on farmers' knowledge in seed selection, management and distribution and is based on local diffusion mechanisms. In general all the activities outside the marketing of improved and certified varieties are considered to belong to the informal sector (e.g. farm-saved seed, seed exchange, etc.). Lipper *et al.* (2010) have well demonstrated that formal and informal exchange channels exist simultaneously and interact in the same country.

Figure 3: Informal (red colour) and Informal (orange colour) seed systems and their relationships



The importance of informal seed systems in guaranteeing access to propagation resource in developing countries is well acknowledged by many researches and papers (see for example FAO, 2009; Bishaw and Gastel, 2010; Lipper *et al.*, 2010). For instance, in the Second State of World's Plant Genetic Resources for Food and Agriculture it is stated, "many country reports indicated that informal seed systems remain a key element in the maintenance of crop diversity on farm and can account for up to 90% of seed movement" (FAO, 2009). It is important to note that this share varies according to the crop and the model of agriculture considered within the same country (Lipper *et al.*, 2010). The continuous presence of these seed supply systems after years of policies addressed to develop an efficient private seed sector it is the demonstration of the market failures.

Informal seed systems are particularly important in the case (i) farmers prefer varieties with specific adaptation to local conditions² or tasting/cooking quality that cannot be obtained from the formal sector; (ii) formal seed systems are inefficient or expensive; (iii) an acceptable seed quality could be easily produced (Louwaars, 2007); (iv) it is difficult to having access to improved seed (Lipper *et al.*, 2010).

It is also difficult to clearly distinguish a system from another, for example improved seed could be reproduced on farm and then exchanged through an informal mechanism or sold in the market. The table 1 summarizes the different type of relationships that one can find

² As an example of the difficulties for conventional plant breeding to face with specific adaptation, we cited what reported by a plant breeder during the workshop on "Social organisation of breeding" (1st IFOAM Congress on Organic Breeding, Santa Fe – USA, 2009): "in order to pay breeding activities one variety should be grown on at least 8.000 ha". It means that the current seed system is constitutionally not able to cope with varieties locally adapted (see for a detailed explanation Ceccarelli, 1989).

according to the kind of market considered.

One good example of the positive interactions between formal and informal systems is the history of the rice variety named *Bordagol*. As reported by Salazar *et al.* (2007) in the Philippines a farmer selected a new variety as an off type of the modern and famous IR36, the archetype of the Green Revolution. Then this variety was officially registered to the Philippine Seed Board. So a modern variety came through an informal selection process, originating a new one, which in turn came official through the formal certification process. Therefore the formal/informal interaction generated new diversity in the field.

Table 1: Seed types and exchanges (Source: Lipper *et al.*, 2010)

Transactions		Seeds	
		Formal	Informal
Markets	Formal	Certified, improved or purified seed sold in an input supply shop or licensed distributors	Sale of recycled farm-saved seeds or landraces in a setting where sale of informal seed is explicitly permitted or where this is not permitted but prohibitions on non-certified seed sale or other deterring regulations are not enforced and the public widely recognizes this.
	Informal	Sale of certified improved seed via non-regulated marketing outlets.	Sale of non-certified seed in transactions where seed is not explicitly recognized as the product. Formal distinctions of seed from grain may not be explicit.
Non-market exchanges		Theoretically, these exchanges would happen very infrequently because the majority of formal seed is produced with the specific purpose of marketing.	Acquisition of seed through sources not involving market exchanges. This includes saving one's own seed or receiving it as a gift from other farmers.

Nowadays promoting informal seed systems is considered important for food security and the sustainable use of PGR, and the challenge is to find the appropriate policies and legislations that can support them in an open and integrated approach with formal ones³.

It has to be noted that also the Report of the special rapporteur on the right to food of United Nations published in 2009 stresses the importance of farmers' seed systems, claiming

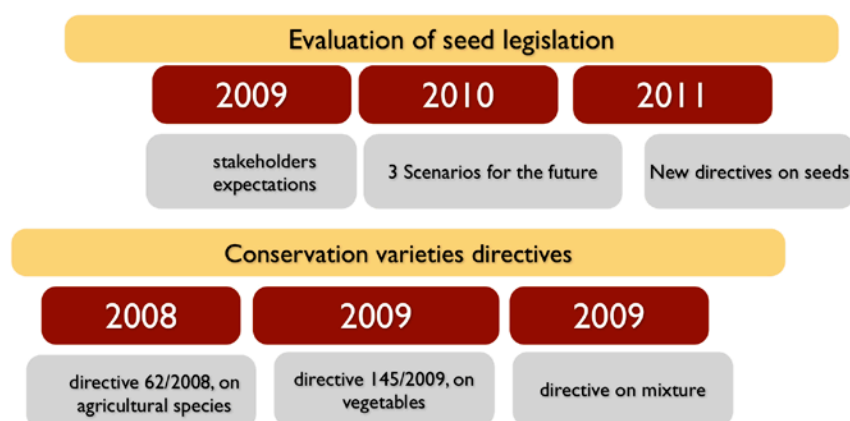
³ During the *Workshop on national programmes' and CGIAR Centres' cooperation to implement the International Treaty's multilateral system to access and benefit-sharing* held in Rome in February 2010, many participants stressed the paramount role of informal seed systems and the different case studies pointed out that the FAO Treaty should support them also through the multilateral system.

that reforming seed regulations is one of the measures that States could adopt in order to ensure that traditional knowledge is kept alive (United Nations, 2009).

5. The situation in Europe

In Europe the market of seeds (production and sale) is strictly regulated by a long series of Directives many of them date back to the sixties and seventies⁴. For that reason the Commission started in 2008 a process of reviewing of the legislation regarding “Seed and Propagation Material” (SPM), with the aim of defining new objectives and needs to which the seed legislation should be address in the future. Therefore the changes proposed by the recent Directives on Conservation varieties must be considered a step in this overall process, targeting a particular type of varieties and answering to some of the new objectives to be included: agrobiodiversity conservation and environment protection (i.e. organic and low input agriculture). A change of the current system is therefore considered an important step in order to meet these objectives. In fact, according to Visser (2002) the tools of legislation for monitoring seed quality and varietal registration, devised for supporting the increase in productivity in post-war years, have since become a constraint to the conservation and development of varieties, which are suited to local farming methods and to the establishment of small seed companies.

Figure 4: The two parallel processes of modification of EU seed legislation



⁴

The European catalogue - based on the National catalogues of EU members - lists those varieties whose seed is marketable within the Community. Varieties must meet specific standards (distinctness, uniformity and stability) and, in the case of agricultural species, each new variety should have a value for cultivation and use (VCU) in order to be listed. The test of this value is based on yield, resistance to harmful organisms, behaviour with respect to factors in the physical environment and quality characteristics.

However, the conservation of agrobiodiversity is becoming a great challenge for European countries. In 2001 a specific Action Plan was prepared by the Commission (Communication from the Commission to the Council and the European Parliament - Biodiversity Action Plan for Agriculture/COM/2001/0162) in order to identify activities and policies targeted to this goal. One specific chapter was dedicated to seed legislation, noting that “The conservation and improvement of *in situ/on farm* plant genetic resources also depends on the effective possibility of sustainable uses and hence on legislation which makes it possible to market diversified genetic materials”. It appears that seed laws has had an unintended negative impact on agrobiodiversity “reducing the numbers of cultivars grown and impinging on the ability of farmers to grow older varieties or landraces not present on the catalogue” (Negri *et al.*, 2009).

The Common Agricultural Policy also reflects this concern and a specific measure targeting on farm conservation of varieties threatened by genetic erosion is planned in the Rural

An Integrated European In Situ Management Work plan: Implementing Genetic Reserves and On Farm Concepts (AEGRO)

Protection of genetic resources *in situ*, safeguarding those most threatened by genetic erosion *ex situ*, and access to a broad genetic variation are the cornerstones of management, utilisation and deployment of genetic variation in agricultural production systems. Genetic variation of cultivated plants has been and is being shaped by agriculture; breeding pools as sources of modern cultivars, conservation and amateur varieties or preservation seed mixtures would not survive without active management by conservationists, breeders, farmers and amateurs. They develop and maintain genetic variation according to the conditions set by the agricultural policy, regional growing conditions, and the specific needs, preference and cultural background of consumers.

This project focuses on the development of conservation strategies for both crop wild relatives that occur in natural or semi-natural habitats and landraces that are often found in traditional farming systems, whose agricultural importance is well known. The development of *in situ* conservation programmes and actions for the habitats of the CWR have traditionally fallen into the domain of environmental policy and their agencies or the forestry where the *in situ* management approach ranks higher than the *ex situ* conservation. There are however strong arguments for integrated European conservation programmes linking nature conservation as well as forestry with the agricultural interest in the wild relatives of crops. Concepts and methodologies for CWR and landrace conservation and use have been developed by the PGR Forum project (EC Framework 5 Programme for Research, Key action 2.2.3 Assessing and conserving biodiversity) co-ordinated by the University of Birmingham and the ECPGR *In Situ* and On-farm Conservation Network. The concepts, such as the genetic reserve and on-farm project, now need to be transferred into the practice.

Landraces inventories in Europe

Italy:

www.catalogovarietalocali.prsi2.parco3a.org/

Switzerland: www.bdn.ch

Scotland:

<http://www.scottishlandraces.org.uk/>

UK: <http://grfa.org.uk>

Development Plan (Meloizzi, 2009). An inventory of varieties and the definition of the concept of genetic erosion are preliminary steps in order to put in place this measure, as such as in the case of conservation varieties. At the moment, it is impossible to make a balance of these policies due to the fact that they are still operational, but they could be considered as an evidence of the increasing awareness of the importance of sustainable use of PGR and their conservation in Europe.

Moreover, the Council of Europe and Planta Europa have submitted a European Strategy for Plant Conservation to the CBD SBSSTA. One of the targets of the phase 2008-2014 is “Prepare a European inventory of traditional, local crop landrace varieties” (Negri *et al.*, 2009).

A more recent literature has investigated the role of informal seed systems in European agriculture and it has stressed their importance with regard to plant genetic conservation and alternative farming systems (for a thorough collection of case studies see Vetelainen *et al.*, 2010; Bailey *et al.*, 2009; Osman and Chable, 2009). In fact, if in some country approximately 90% of seed is usually purchased (Denmark and The Netherlands), this percentage is only 10% in southern European countries like Italy and Greece (Louwaars, 2007). Moreover European seed producers currently estimate the use of farm-saved seed in major cereal markets in Europe at 50% (see table 2). Clearly in the table within the category “illegal” one can find the use of protected varieties without paying royalties, but we presume that it could contain also the use of varieties not listed in the Official Catalogue.

As said by Louwaars (2007): “The importance of farmers’ seed systems in Europe often comes as a surprise to many seed specialists and agricultural policy makers in developing countries”. On the same line, the Second State of the World’s Plant Genetic Resources also states, “in Europe [...] local, small-scale, non-commercial exchange of planting material remains quite common” (FAO, 2009).

Table 2: Seed sources in Europe (Source: Le Buanec 2005, modified by the authors)

Pays	Culture	Semences		
		Certifiées	Farm saved seeds	Illégales
France	Blé	58	42	
Allemagne	Céréales	54	40	6
	Pomme de terre	44	56	
Pologne	Blé	7	93	
	Avoine	5	95	
Angleterre	Blé	51	31	18
	Orge d'hiver	55	15	30
	Orge de printemps	66	14	20
	Haricot	37	18	45
Italie	Blé dur	90	10	
	Blé tendre	70	30	
	Luzerne	75	5	20
	Orge	80	20	
Hollande	Pomme de terre	61	39	
	Céréales	65	35	
Finlande	Céréales et légumineux	30	47	23
Suède	Céréales	72	28	
	Pomme de terre	35	65	

6. The FSO studies

Farm Seed Opportunities has painted a broad picture of the variety and seed situations in Europe. The first and foremost result is that Europe is still full of diversity, at cultural, environmental, climatic and farming levels. Reading FSO reports one finds out that the diversity is at all the levels, from one country to another, from one stakeholder to another. Even if the formal system tends to impose its norms and modernization through regulations, it fails to answer to the diversity of the European farming systems. For that reason, many farmers – mainly in alternative farming systems – don't find the seed they want through the formal seed system.

Traditional (or “informal”) seed systems still remain and innovation appears within these systems, based usually on traditional or local varieties. Even if agricultural modernization has changed the landscape of Europe in the last 40 years, no-marketable seeds have still their place in agriculture also from the economic point of view (seed Deliverable D.4.4 “National survey on the role of innovative markets” and D1.3 “Characterisation of stakeholder expectations – an expert survey”).

DIVERSEEDS a scientific project supported by the European Commission’s 6th Framework Program.

This project elaborated a list of recommendations and strategies to improve the sustainable use of plant genetic resources, especially in centers of origin.

FSO participated to its e-conference on conservation and sustainable use of plant genetic resources in Europe and Asia. Regarding Europe one of the concerns that emerged was that “the legal situation is not clear and conflicts with group engaging in preservation of agrobiodiversity have occurred. For developing efficient strategies for conservation and development of landraces the legal and commercial structures need to be discussed”

FSO found that alongside the dominant conventional agricultural practices, a different agriculture strongly connected to “terroir” (a French word that refers simultaneously to the soil, climate and cultural values of an area) has been preserved and is now re-emerging in Europe. This alternative agriculture is based on different varieties than conventional agriculture, ones with strong local adaptation. Moreover, locally adapted varieties, old landraces and mixed populations play a more important role in organic than in conventional agriculture (Wolfe et al., 2008). In addition, quality aspects linked to specific regional or handcrafted products are generally important in alternative agricultural systems, and are often responsible for the preservation of local varieties or the diversification of the farm (Naziri, 2009).

The concept of Conservation Varieties is being defined with the aim to support the conservation and sustainable use of plant genetic resources in agriculture and so implementing the International Treaty on Plant Genetic Resources for Food and Agriculture signed by Europe Union in 2004. The objective of conservation is achieved by the tool of derogation from the present-day seed system, on the one hand to allow these varieties to be registered in the Catalogue, and on the other to establish a minimum of procedures for the sale of the seeds.

It creates a class of varieties, which have to meet the following requirements:

- a. It should be a link between a variety and its area of origin;
- b. The variety should be at risk of genetic erosion;
- c. The variety should meet a loose uniformity standard.

The marketing of seed of such varieties, which are not registered in the Official European Catalogue for reasons of lack of uniformity/stability or value for cultivation and use, is made possible within certain limits. The aim therefore is to create a specific market with rules that are more appropriate to the needs of the users of these varieties.

The idea of differentiating market according to their different target, could also be found in the conclusion of the Food Chain Evaluation Consortium that in the Final Report presented in March 2009 in Brussels affirms that “the two different systems of the large commercial breeding companies and the smaller market or regional breeders and producers could run side by side because they are targeting completely different markets” (FCEC, 2008).

Outside the limits set up by the directives on conservation varieties, FSO found that legal space is missing in Europe for non-uniform varieties, mainly population, or farmers’ varieties, which could be very relevant for the survival of food tradition and organic and low-input farming systems.

6.1. Conservation varieties, some bottlenecks

Basically two types of varieties could fall under the concept of conservation variety: **traditional farmers’ varieties/landraces (if they are enough uniform and stable) and commercial varieties once registered in the catalogue (if they have an area of origin)**, but for which the commercial interest declined.

6.1.1. The notion of “landraces”

The diversity of the approaches in the member states could be evaluated by the diversity of the translations of the word “landrace” in the national versions of the directive. This diversity expresses the different opinions that national policy makers have with regard to agrobiodiversity.

Table 3 : Translation of the term “landraces” in the text of the 2008/62/CE directive in the national versions

Country	Translation of the word “Landraces”	Re-translation in English	Point of view
France	Races primitives	Primitive, original or basic	Historical, social or biological
Germany	Landsorten	Landraces	Historical, biological
Italy	Ecotipi	Ecotypes	Ecological
Spain	Variedades	Varieties	Biological
Romania	Soiurilor locale	Local variety	Geographical
Portugal	Variedades autoctones	Autochthonous varieties	Geographical and social
Hungary	Honos fajok	Home variety	Sociological

Moreover, stakeholders’ consultations also revealed that concepts dealing with landraces are frequently mentioned in everyday life in EU countries. Most of them use terms that refer to both the regional or historical patrimony, and ecological or socio-economical values.

“A landrace of a seed-propagated crop is a variable population, which is identifiable and usually has a local name. It lacks 'formal' crop improvement, is characterized by a specific adaptation to the environmental conditions of the area of cultivation (tolerant to the biotic and abiotic stresses of that area) and is closely associated with the uses, knowledge, habits, dialects, and celebrations of the people who developed and continue to grow it.”

On-Farm Conservation and Management Taskforce of the European Cooperative Group on Genetic Resources (www.ecpgr.cgiar.org/Networks/Insitu_onfarm/OnfarmTF_intro.htm)

6.1.2. Uniformity

Various concerns can be raised to the text of the directive, but most of these may be tackled in the implementing rules that individual countries are about to draft. One key concern deals with the **uniformity requirement**. We therefore analysed current methods and standards for uniformity and conclude that a minimal description of the salient features of the conservation variety may suffice. In case a registrar may want to apply detailed descriptions for the registration of conservation varieties, then the same methods may be used as for conventional varieties with the exception that methods developed for cross fertilizing crops may need to be applied for the description of genetically diverse self fertilising crops. This solution has – however obvious it may be – not been included in the directive. Strict uniformity standards should not apply since the key objective of registering conservation varieties is to promote the sustainable use of diversity and that *identifiability* is a primary

aim and not uniformity. Two issues need careful consideration: the inherent lack of stability of landraces may require a wide interpretation of the identity (description) of the landraces being considered as conservation variety, including an option to re-register a variety when it changes over time (e.g. as a result of climate change) and the fact that current seed certification standards for uniformity are much stricter than the registration standards. These aspects need to be dealt with in the implementing rules at the national level.

6.1.3. Genetic erosion

A variety to be listed in the catalogue as a conservation variety should be at risk of genetic erosion, but it is very difficult to define the levels in plant genetic resources, because it is not easy to express its state in numerical terms. First and foremost a census or a list of the local varieties still grown by farmers would be needed in order to estimate the risk of inter-varietal erosion (Negri *et al.*, 2009). Secondly, the variability of each local variety would have to be known - these are often fairly heterogeneous populations – to estimate the risk of intra-varietal erosion. Obviously, the absence of a preparatory cognitive survey makes it very difficult to indicate the risk of genetic erosion of a specific resource. Furthermore, even assuming being able to quantify the risk of erosion there is still a marked contradiction. When the seed of a conservation variety is sold in conformity with all the rules, can it still be considered at risk of genetic erosion? The answer most in line with the objective of the directive is that once it is marketed the variety becomes no longer at risk although it is still a “conservation variety”, even though the directive says the contrary since it has lost its qualifying property of being at risk of genetic erosion. According to Lòpez Noriega (2009) “it is expected that some unclear issues, such as the definition of *threatened by genetic erosion*, will be clarified during its national implementation”.

6.1.4. Region of origin

Linking a conservation variety to a certain region of origin, such as required in the new directive, is highly questionable or at least this concept can be useful for some type of conservation varieties – mainly which are called local varieties – but not for all. Moreover, many old varieties, which may be thought to be local varieties, originate from elsewhere. Hence, from a historical and ecological point of view there is no reason to restrict a plant genetic resource to a certain region. On the other hand, the name of a variety could be strictly correlated to a particular area; hence, it may be useful for some local communities to

have means to protect their patrimony from the global market (e.g using tools like geographical indications). It is, however, evident that in the absence of socio-anthropological research in the territories where the varieties are still grown and a parallel historic investigation on the sources, it makes little sense to talk about origin (Bocci, 2009). In general, an evolutionary approach is needed regarding the history of varieties and the agriculture, in order to promote within seed legislations further evolution and creation of diversity.

6.2. Different varieties grown in the fields

Seed laws define rules on how to put seed into the market (according to the definition of commercialisation), but as it has already been pointed out seeds have many values and the monetary is only one of them. As for the case of conservation, other values play an important role in determining farmers' choice to grow or not a specific variety (Lipper *et al.*, 2010). That is the reason why we found many kind of varieties still cultivated in farm fields, which don't fit exactly to the actual seed legislation.

At this regard, it is to be stressed that conservation varieties will be limited to a specific kind of variety for which a link with a certain territory will be historically demonstrable. This, therefore, is not a category for lumping together all the varieties, whose seeds at the moment cannot be marketed, and for which it will be necessary to explore different legislative openings.

In particular we refer to the following categories:

- a. The varieties produced by participatory plant breeding (PPB) not in conformity with DUS requirements;
- b. The old varieties no longer registered in the Catalogue (there are factors that can make registering these varieties problematical: excessive registration costs, difficulty in proving the VCU, only limited marginal areas interested in growing them) and which do not have a precise geographical area of origin;
- c. Local varieties used as genetic resources in reintroduction programmes, to cultivation in different areas from their area of origin;

- d. Populations that have no historical link with a given territory or that have been bred by innovative methods based on the natural mating system of the species and which capture the advantages of the diversity, and which cannot be registered in the official catalogue having no correspondence with the DUS criteria (for a description of the genetic structure of populations and their use and importance in organic agriculture see Wolf et al., 2008).

These populations may be important for increasing genetic diversity in the field – specifically in organic and low-input agriculture -, playing a key role also in facing climate change. The FSO purpose has been to define these varieties, to describe their potential value and to analyze bottlenecks and opportunities within the current seed legislation in Europe to register such varieties. Data are available from WP2 (deliverable D2.3) in which on-farm experiments (25 trials in 3 countries) were conducted with “non-conventional varieties” (landraces, old varieties and new farmers varieties) during the 3 consecutive years of the project (2007-2009) with the objective of assessing the evolution / adaptation over time and space of these varieties when they are moved from one environment to another.

Due to the fact that old varieties (b) and landraces (c) have been already defined by many studies, FSO focussed its activities on (i) **populations**; (ii) **farmers’ varieties**.

Table 4: Characteristics of different varieties according to DUS requirements, research model and seed market.

	Conventional varieties	Conservation varieties	Populations	Farmers’ varieties
Characteristics	DUS/VCU	Adapted DUS	Not uniform	Diverse situations of homogeneity
Research/ breeding	Formal research	Formal/informal research	Formal/informal research	Informal research and PPB
Seed Market	International rules	Area of origin	Local, national or international markets	Local market or informal exchanges

6.2.1. Populations

Plants breeding methods, the needs of the mechanized agriculture, and the enlargement of the markets with uniform produce have gradually increased the importance of uniformity in agriculture. The formal seed systems and its rules and laws have well performed in this direction. Uniformity does, however, not always have agronomic advantages. Where disease

resistance is based on gene-for-gene systems it may be advantageous to have different resistance genes in a variety in order to reduce the risk that the micro-organism breaks through the resistance which reduces the value of the variety. More in general, genetic diversity in the field can stimulate tolerance phenomena and can buffer different stress factors that crops face (Zhu *et al.*, 2000).

Some examples of populations

Different plant breeding methods have been developed in order to capture the advantages of diversity. In self fertilizing crops the concept of multilines was developed in the 1970s. A mix of near isogenic lines which differ only in the stress-resistance factor (e.g. disease resistance) offer the required uniformity in agronomic terms while at the same time creating valuable diversity within the variety. In cross-fertilizing crops wider range of strategies is possible, which can be illustrated with the history of maize breeding. Originally, maize varieties were open-pollinated populations. Innovations include the synthetic variety, developed through the combination of a set of more or less inbred materials selected for their combining ability, which are then allowed to pollinate freely (diversity is well defined and limited to some extent). The discovery of the concept of heterosis created a wide diversity of strategies. The most extreme is the single cross hybrid, which is very uniform. Three-way and double cross hybrids combine 3 or 4 parents and as such combine a slightly higher level of different alleles. A top cross is the combination of an inbred line with a population. In other crops, family crosses are also used. All these different populations have different levels of diversity (uniformity).

Breeding methods to broaden the intra-varietal diversity is likely to become increasingly important, particularly in alternative farming systems (organic, biodynamic etc.). A population, bred, multiplied and conserved by open pollination is a plant grouping which is reproduced by free pollination inside the group of plants cultivated in the same kind of ecological conditions for which they are adapted. From one side, their free pollination allows that all the individual may be heterozygous, different from one to another, and different from one year to another (the level of heterozygosity depends on the level of autogamy), and from another side, the repeated cultivation in the same biological conditions with the same objectives of selection determine the common characters which bring together the plant grouping. This plant grouping should also be distinguished from any other plant grouping by the expression of at least one of the said characteristics and it should be considered as a unit with regard to its suitability for being propagated unchanged but only this or these characteristics. The interest of these plant populations is their great

adaptability to local conditions with few inputs. In the context of their cultivation, breeder or farmers may practice a conservation selection or a simple breeding methodology which aims to conserve the main characteristics and which let them evolve for better adapt to the specific conditions of the farms, to the cultural practices, to their needs and those of the consumers.

6.2.2. Farmers' Varieties

Other kind of new varieties are the so-called *Farmers' varieties*, as defined by Salazar *et al.* (2007). Their diverse genetic origins and homogeneity characteristics give them criteria from new landraces (in the meaning of allochthonous landraces developed by Zeven (1998) to new fixed varieties). Their diversity may be found also in the ways of diffusion: traditional seed

Farmers' varieties

The concept was developed to identify the results of breeding by farmers themselves, commonly in a collaborative setting with trained plant breeders. Such varieties may be quite uniform, such as a red rice variety developed in The Philippines, but in other cases farmers – particularly this in ecologically diverse environments – select for a certain level of diversity. Even though the varieties are selected for their specific adaptation to the conditions of the farmers who select, products may be useful for farmers in other regions, which would involve formal seed production and distribution, and thus registration. In Nepal, farmer-breeders cooperating in “Local Initiatives for Biodiversity, Research and Development” (LIBIRD) have registered rice and maize varieties in order to market them in other regions of the country. Such participatory plant breeding (PPB) has also started in Europe (Chable *et al.*, 2009; Desclaux *et al.* 2005; Lammerts *et al.*, 2005), particularly to develop varieties for organic agriculture. PPB normally takes the locally available varieties as a starting point and creates new ones through selection or crossing with exotic parents that bring in traits that the local variety is ‘missing’. The contribution of the farmers to the genetic resources conservation is recognised by the CBD (Convention of Biological Diversity) and the ITPGRFA (International Treaty on Genetic Resources for Food and Agriculture), ratified by the European Union. *In situ* conservation belongs to the European strategy. The dynamic management of the genetic resources has shown its ability not only to maintain the initial genetic diversity but to increase it. This management needs exchanges from several cultivation areas and the research of the variability through the exchanges. Breeding (often in the framework of participatory research with public organisations) and seed multiplication on farm favours the adaptation and preserves the adaptability to local environmental conditions and its evolution. The renewal of the genetic diversity is as much efficient as the network is enlarged to several farms with variable environments. A system of protection of farmers' varieties has been envisaged by Salazar *et al.* (2007).

exchanges within farmer communities or market (local market or direct sale at the farm). Farmers' new varieties do not fall within the definition of “conservation variety” since they are not necessarily traditionally grown, they are not at risk of extinction and moreover they

could have a broad range of degree of uniformity, depending on the type of breeding methods.

6.3. The International context

The FSO project paid particular attention to the International regime on PGR and as a matter of fact participated to the different negotiations that took place during its duration (e.g. the Governing Body of the ITPGRFA, the Conference of the Parties of the CBD). FSO partners were fully aware that European situation should be considered within this international framework and in a strong interrelation between local, national and international policies.

For that reason a specific event was organised at the end of the project, with aim of presenting FSO outcomes, but also improving them with comments, suggestions and experiences from Southern countries and/or countries not included in the project. Outcomes of the International Conference can be found in the D4.5 and they point out the importance of sharing experiences, problems and innovative solutions on seed laws and participatory plant breeding between North and South countries. European countries, in particular, have a lot to learn from experiences on participatory plant breeding and innovative seed laws (e.g. Brazil and Nepal) that are emerging in Southern countries.

FSO found out the different countries share the same problems or concerns. It is interesting therefore to present in summary some of them.

6.3.1. Canada

Canada has in place a seed system similar to the European one. There is a modernization project that aims at reducing the number of years of the registration trials and the number of traits considered for the Value of Cultivation and Use. In this context there is no place at the moment for organic agriculture and/or varieties. Regarding GMOs, the conventional seed system is unable to segregate from GMO seeds and contamination of seed sources is quite common. For this reason organic farmers are starting to reproduce their own seeds, within the framework of a technical project on farm saved seeds. Farmers are also developing a PPB project within the network of farmer breeders.

6.3.2. Syria

The informal seed system in Syria covers 90% of the barley seed: exchange of non-officially released varieties is the norm. The PPB programme started in 1995 in collaboration between the Syrian National General Commission for Scientific and Agricultural Research (GCSAR) and ICARDA. Today the project involves 24 villages across Syria. The farmers involved: (i) grow the PPB varieties in their fields; (ii) evaluate the varieties and decide what varieties to grow each year; (iii) are involved in setting priorities and methodologies; (iv) can multiply their preferred varieties and exchange or sell them. The impact of PPB has been very positive for: (i) increasing yields; (ii) targeting farmers from the most marginal; (iii) decreasing crop failure by enhancing biodiversity; (iv) empowering the farmers; (v) enhancing rural livelihoods; (vi) strengthening farmers' seed systems. Even so, the Ministry of Agriculture and Agrarian Reform argues that: (i) PPB varieties are to be released through the standard system of conventional breeding: 4 years in PPB fields + 3 years without farmers' participation; (ii) according to the system, selling and exchanging not-officially released seed in Syria is illegal. But there is no national seed law that restricts the exchange of seed. A law was drafted in 2002 with FAO to regulate the exchange of plant genetic resources based on the International Treaty on Plant Genetic Resources for Food and Agriculture.

6.3.3. Peru

90% of seeds are produced in the informal seed system and the agrobiodiversity is a way of managing risks in search of food security. There is a PPB project on potato, corn and bean and Community seed banks have been set up. Two inventories have been realised: one for native potatoes, with 28 minimum descriptors identified with farmers' participation (a specific law passed in 2008 on this issue); one for national corn, based on 11 descriptors for classification, containing also recommendations for the participatory characterization and the identification of farmer's name or community using a particular landraces.

6.3.4. Norway

Norway has few farmers left (around 45.000 farms), and a small but growing minority of these are engaged in diversity farming. They normally use older varieties, which are more genetically heterogeneous and thus easier to adapt to their specific growing conditions and develop further according to own preferences. The majority these farmers – which probably do not count more than around 100 people, are small-scale organic, particularly biodynamic

farmers. They need varieties that are not adapted to the use of fertilizers and pesticides. There is also an expanding niche market in terms of demand for better nutrition, old traditional food, and exiting new products. A kind of informal seed system is still in place: landraces are used to some extent, old commercial varieties are frequently used, farmers exchange seeds among themselves and across borders, some farmers get seeds from Nordgen, the Nordic gene bank, and farmers develop the varieties from season to season by selection. As Norway is a member of the European Economic Area Agreement (it is not an EU member), it has to implement all EEA-relevant EU directives. The EU directives on variety release and seed marketing are EEA-relevant and are thus implemented in Norway. Due to introduced laws from EU, variety release and seed marketing regulations has prohibit seed exchange/sale among farmers, and the marketing of varieties that are not on the official lists of crop varieties from 2004 and until 2010. In 2010, however, Norway has introduced new regulations, based on the EU Directive on Conservation Varieties. The new regulations allow exchanging, giving away and selling of seeds among farmers and gardeners on a non-commercial basis. It also allows for the release of plant varieties, which are considered conservation varieties, following the EU-rules but interpreting them less strict as may be the case in other countries. The new Norwegian rules also allow farmers to establish authorised seed shops for conservation varieties with simple procedure and lower requirements than for other seed shops. The latter is meant to enable the marketing of conservation varieties on a commercial scale.

The customary use of farmers to select seeds for use the next season is quite widespread in Norway, and is also common among conventional farmers to some extent. For this reason, and to ensure a fair balance between farmers' and breeders' rights, Norway decided not to become member of UPOV based on the 1991 Act.

6.3.5. Hungary

A programme of multiplication and diffusion of landraces was initiated around 1960 by the national seed bank, aimed at preserving collected landraces, old cultivars, and local varieties and compensating reduction of genetic variation resulting from multiplication under the same edaphic and climatic conditions year by year. The number of requests significantly increased due to the growing interest of farmers and breeders. Their motivations were: (i) searching special traits (quality, tolerance, shape, color); (ii) history; (iii) organic farming; (iv)

raising awareness on agrobiodiversity. Problems foreseen with the Conservation varieties directives: (i) where to get the seeds? (ii) who are the registered maintainers; (iii) the majority of the varieties are stored in genebanks that are not prepared to diffuse them for lack of capacity.

6.3.6. Brazil

The Brazilian agricultural sector presents a strong duality between agribusiness for export on one side, and family farming on the other. Informal seed systems are important and they account for 60% in the case of rice, 87% in beans, 17% in corn, 46% in soybean and 34% in wheat. These are growing due to: (i) lack of trust in “formal” varieties”; (ii) low quality and high prices of commercial seeds. Seed law (law no. 10.711/2003, regulated by Decree no. 5.153/2004) regulates formal seed system, but creates some legal space for farmers’ and local seed systems: (i) there is **a legal definition of local, traditional or creole varieties**: varieties developed, adapted or produced by family farmers, agrarian reform settlers or Indigenous peoples, with well established phenotypical traits, recognized by the respective communities as such and taking into consideration also socio-cultural and environmental descriptors, (not only agronomic). They cannot be characterized as substantially similar to commercial varieties; (ii) **waiver of official registration for local varieties**: Registration in the National Cultivar Registry of local, traditional or creole varieties used by family farmers, agrarian reform settlers or Indigenous peoples is not mandatory” (due to inadequacy to DUS criteria); (iii) **waiver for family farmers**: “Family farmers, agrarian reform settlers and Indigenous peoples who multiply seeds or seedlings for distribution, exchange or trade with each other are not required to register in the National Seed and Seedling Registry. The Decree created the following restriction: “farmer organizations can only distribute (not sell) seeds, and only among members of these organizations”. This interpretation is questioned by farmers’ organizations.

6.3.7. Nepal

The traditional seed systems contribute to 90% of seeds of food crops and are characterized by production, exchange, and sale of farm saved seeds of both local and improved crop varieties. The formal seed system is characterized mainly by public sector seed production and distribution of new varieties, with limited engagement of private sector. Seed production and marketing is regulated by Seed Laws, but in practice remain largely

unregulated. The Seed act of June 2005 changed application formats in favour of PPB varieties to include: (i) farmers' perception data; (ii) organoleptic taste data; (iii) accept data from participatory assessment; (iv) national listing (registration) of landraces and local crop varieties, including farmers' varieties; (v) provisions for production and marketing of farmers' varieties – both notified and non-notified.

6.3.8. Scotland

There are around 17.000 small farmers on Highlands and Islands, with an average land holding of less than 20 ha. Mostly this is part-time agriculture. Landraces are still grown for barley, small oat, oat, rye, and cabbage. An *ex situ* conservation system is in place aiming at: (i) guaranteeing a safety back-up for seed growers; (ii) monitoring of seed quality and feedback to seed growers; (iii) inventorying landraces (www.scottishlandraces.org). Regarding conservation varieties Scotland will make a light implementation of the directive, and they have concerns about: (i) the definition of area of origin; (ii) costs for growers. Finally alternative tools for conservation may be better suited.

7. FSO propositions

Finding a right balance between formal and informal seed systems within European context should be one of the objectives of a regional strategy for on farm conservation of plant genetic resources for food and agriculture. Such a strategy will also concretely address the implementation of the article 6 on sustainable use of PGR of the ITPGRFA. We remind that this article is mandatory for Contracting Parties and is addressing to all the crops and not only to these listed in annex I, as for example in the case of the Multilateral System.

Moreover, it will ease the debate on Farmers' rights at regional and international level due to the fact that many actions included in article 6 are also in strict relation with article 9. The promotion of the use of local varieties and underutilised species can be considered a way of protecting of traditional knowledge (Article 9.2(a)). Increasing farmers' options through participatory plant breeding could be considered a non-monetary benefit sharing measure (Article 9.2 (b)). Therefore an integrated on farm strategy that includes informal seed systems and their varieties should consider the promotion of Participatory Plant Breeding (PPB) strategies to help farmers to fulfill their needs, facilitating them in accessing the genetic resources and broadening the range of available species all they are actions aiming

to bring compensation in farmers' favor (Louwaars and Visser, 2006). For this reason article 9.2 (b) can be considered close to articles 6,2 (b) (d) concerned about research promotion, Participatory Plant Breeding and farmers' access to the genetic resources. Finally, promoting diversified agricultural systems (art 6.2a) through policies that support informal seeds system will enhance farmers' role on seeds exchange, reuse and sell in agreement with article 9.3.

In this framework the on farm strategy should allow the presence on the market of proximity (local market or direct sell) of the varieties identified by FSO, and at the same time needs to avoid creating opportunities for the diffusion of poor quality seeds on commercial markets⁵. To this goal the role of networks or associations could be a key element in order to set up a bridge between formal and informal seed systems. The latter, as already pointed out, is a specific system based on social norms: trust, reputation and reciprocity govern it. Therefore enhancing the role of social networks (i.e. the trust and reputation of people reproducing seeds within a community) could improve the quality of informal seed system. At this regards, the directives on conservation varieties open a new interesting possibility, for the first time allowing organisations to have a role within seed legislation (article 34 of the directive 2009/145/CE and 21 of the directive 2008/62/CE). A specific attention should be paid in order to monitor the process of notification to the Commission of the recognised organisations.

Finally, we would like to stress the importance of such a strategy, also because “it is impossible to replace farmers' seed systems completely and it would be unwise to try. Farmers' seed systems provide an important component of food security, a vital haven for diversity and space for further evolution of PGR” (FAO, 2009).

Since the directives on conservation varieties have been already published, we will only summarise the limits of its applicability. For the populations and farmers' varieties we will bring suggestions.

⁵ It should be noted that the legislation currently under review pertains to marketing and as such there is no reference to farm saved seed in it, as this does not constitute marketing.

7.1. Conservation varieties

- Catalogue: (article 4, 2008/62/EC) It is important to focus on identifiability (distinctness) rather than uniformity and stability of landraces. It is suggested in some countries to base the distinctness description on the characters that the applicant uses to identify. The criteria will be determined taking into account the previous experiences and knowledge of the varieties. The U and S characters might be chosen among those which are listed in the annexes I and II of the directive 2003/CE, without obligation of considering all of them, or among specific characters which distinguish the variety. The criteria have to take into account the reproduction system of the variety, which allows the stability of common and stable criteria through the successive multiplication, in one recognizable entity distinct from the other varieties. In the FSO trials, distinction among varieties using phenotypic observations (in the field or on harvested grains/seed) was always possible: on-farm experiments and the common experiment at Le Rheu always had a significant main effect of the variety in ANOVA for each measured character. This was true even in the presence of strong GxE interactions which modified phenotypes from one farm to another and even when varieties appeared heterogeneous.
- Diffusion: To make optional and not obligatory the geographical limitations imposed on the marketing of the conservation varieties, to adapt and to increase the quantitative limitations. In the FSO trials (see deliverable D2.3), some landraces gave very good results, sometimes even superior results, for certain productivity traits outside their zone of “origin” or “natural adaptation”. Therefore, limiting cultivation of these varieties to a narrowly defined geographic zone would limit farmers’ choice of and access to potentially interesting landraces and historic varieties. In addition, the reduction of permitted cultivation to a legally defined geographic zone for conservation varieties would favour the increased genetic erosion of these varieties both by limiting population numbers and sizes and by limiting the range of environmental conditions to which the variety is exposed (thus constraining their evolutionary potential).

7.2. Populations

Should they be introduced in the category of varieties with “no intrinsic value for commercial crop production but developed for growing under particular conditions” (2009/145/CE) or do they need a specific mention in the common catalogue?

- Two options for the catalogue:
 - The new catalogue of « vegetable with no intrinsic value for commercial crop production but developed for growing under particular conditions » should be extended to populations of all the regulated species, with adapted U and S criteria, and without limitations of packaging for marketing or with limitations compatible with the needs of the farmers using these varieties.
 - The creation of a specific catalogue (inventory) for population varieties or a specific section of the Official Catalogue.
- Description (for both options)
 - Adaptation of U and S criteria for populations or composite population, mix of varieties, or other organic varieties.
- Diffusion
 - No limitations of packaging for marketing or with limitations compatible with the needs of the farmers using these varieties.

7.3. Farmers' varieties

When the new farmers' variety originates from a conservation variety through selection within that traditional farmers' variety, and if it still falls within the description of that variety (the main characteristics remain the same, but e.g. disease resistances are enhanced), if the registration is needed, the authority may allow the new selection to be maintained and marketed under the same registered name – possibly with a reference added.

- Catalogue: Optional registration with the recognition of the collective property of the varieties and/or the activity of genetic resources conservation (both cases 7.1.1 or 7.1.2 are possible).
- Diffusion. Acknowledgement of the informal exchanges (needed for the their activity and the renewal of the diversity) between farmers who are involved in conservation, research and breeding activities in their agricultural production. No registration and certification needed for the direct sale of the seed produced by a farmer on its farm to the final user for conservation activity or self consumption; for the other sales, a

registration as defined in 3.4.2 with the recognition of the collective rights for using the varieties linked to the farmers contribution to the conservation and dynamic management of genetic resources (on farm conservation). The examples mentioned by the deliverable 2.1⁶ about an inventory of initiatives on seeds in Europe" may be one among several possible solutions to the problem of "farmers' varieties": farmers organised themselves within seed associations like "Syndicat de promotion Touselle" for wheat in the South of France, or like "Kaol Kozh" for vegetable in the West of France (see also Chable et al 2009).

7.4. Role of Innovative Market Promoting Sustainable Use of Agrobiodiversity

Market could be one useful tool for achieving on-farm conservation of plant genetic resources, as already pointed out by the Global Plan of Action for the sustainable use of PGR on its Section 14 "Developing new markets for local varieties and diversity rich products". FSO analysis demonstrated that in search of a right balance between market and on-farm conservation, it is important to unpacking what a market is, according to the different relationships between sellers and consumers (e.g. local market, direct sell, international market, cooperatives). Different types of market have different impact on agrobiodiversity (Naziri, 2009). Moreover, as pointed out by Regine Andersen (2008) with regard to agrobiodiversity, the major problem in the most industrialized countries lies in its recovery and appropriate valorisation.

It is also important to note that whatever market we are talking about, it is requiring in general a certain degree of standardization and homologation, increasing more distant are farmers and consumers. At this regard, particular attention should be paid to definition of the code of practices for the registration of produce as PDO, PGI or STG. In fact, according to how they are set up, cultural and biological diversity could be reduced (Bérard and Marchenay, 2008).

It is also pivotal to promote and maintain the informal seed system behind each GIs, brand or label, creating a legal space for these seeds as conservation varieties.

⁶ FarmSeedOpportunities-Deliverable 2.1: Aart Osman & Véronique Chable, (December 2007) "Breeding initiatives of seeds of landraces, amateur varieties and conservation varieties: An inventory and Case studies"

8. Questions to be addressed

- a. How to finance PPB in a trend of decreasing of public investment in agricultural research?
- b. How to promote an informal seed system with good quality, without opening the room to unfair competition between seed industries?
- c. How to deal with VCU systems for varieties for alternative farming systems, e.g. the varieties listed in paragraph 6.2? How will be possible to take into account, at the same time as the official trials, other field observations of non-evaluated criteria (e.g. adaptation for agronomical practices, local conditions, technological use or specific use, interactions with inputs or other available varieties...)?
- d. How the Conservation varieties directives will be interpreted and implemented by Member States? This concern is also apparent in the final report of the evaluation of European seed legislation prepared by the Food Chain Evaluation Consortium (FCEC): “FCEC concerns is that the new Directive may well be restrictive if implemented in a wrong way and FCEC is not certain that Member States will understand how to implement it with flexibility, freedom and adaptability that the Commission intended” (FCEC, 2008). As a matter of fact, fully implementation in Member States is still far to be reached. For example, in Italy, that harbour many landraces still in use and already listed in the regional inventories, to date only one conservation variety has been added in the Conservation varieties catalogue.
- e. Not a lot of research has been done on the impact of market instruments on agrobiodiversity. Even if a lot of projects and researches have been undertaken on Geographical Indications – analysing their impact on rural development, their economic benefit, the impact on small farmers or as a key for local innovation through collective action - very few words have been spent in order to check the compatibility of GIs with agrobiodiversity and in particular their coherence with seed laws.

9. References

Andersen R., 2005. The History of Farmers’ Rights. The Farmers’ Rights Project Background Study
Bailey A., Eyzaguirre P., Maggioni L. (eds), 2009, Crop genetic resources in European home gardens, Bioversity International

- Bérard L. and Marchenay P., 2008, From localized products to geographical indications, Centre national de la recherche scientifique
- Bertacchini E., 2009, Regional legislation in Italy for the protection of local autochthonous varieties, *Journal of Agriculture and Environment for International Development*, vol. 103 (1/2), Istituto Agronomico per l'Oltremare
- Bishaw Z., van Gastel A.J.G., 2009, Variety release and policy options, in Ceccarelli S., Guimaraes E.P., Weltzien E. (eds), *Plant breeding and farmer participation*, FAO
- Bocci R., 2009. Seed legislation and agrobiodiversity: conservation varieties, *Journal of Agriculture and Environment for International Development*, vol. 103 (1-2), Istituto Agronomico per l'Oltremare
- Camacho Villa, T.C., Maxted, N., M. Scholten, Ford-Lloyd, B., 2006. Defining and identifying crop landraces. *Plant Genetic Resources: Characterization and Utilization*, 3: 373–384.
- Ceccarelli S (1989) Wide adaptation: how wide? *Euphytica* 40:197–205
- Ceccarelli S., Guimaraes E.P., Weltzien E. (eds), 2009, *Plant breeding and farmer participation*, FAO.
- Chable V., Lammerts van Bueren E., 2009. "Report on the definitions of varieties in Europe, of local adaptation and of varieties threatened by genetic erosion", *Farm seed opportunities*, Specific Targeted Research Project, VI Framework programme
- Chable V., Le Lagadec F., Supiot N., Léa N., 2009, Participatory research for plant breeding in Brittany, the Western region of France: its actors and organisation. *Proceedings of the 1st IFOAM Conference on Organic Animal and Plant Breeding, Breeding Diversity*, August 25-28, 2009 - Santa Fe, New Mexico, USA, 363-370
- De Schutter O., 2009, Seed policies and the right to food: enhancing agrobiodiversity and encouraging innovation, United Nations
- Desclaux, Dominique, 2005. Participatory Plant Breeding Methods for Organic Cereals; review and perspectives. Driebergen, *Proceedings of COSTVAR and Eco-PB workshop*, January 2005. http://www.eco-pb.de/09/proceedings_050117.pdf#page=18
- Drahoš P., Braithwaite J., 2003, *Information Feudalism*, W. W. Norton & Company
- FAO, 2009, Draft Second Report on The State of the World's Plant Genetic Resources for Food and Agriculture (Final version), CGRFA
- Food Chain Evaluation Consortium (FCEC), 2008. Evaluation of the Community acquis on the marketing of seed and plant propagating material (S&PM), Final Report, European Commission Directorate General for Health and Consumers.
- Fowler C., 1994, *Unnatural selection: technology, politics, and plant evolution*. Gordon and Breach, Langhorne, PA, USA
- Fowler C., Mooney P., 1990, *Shattering: Food, Politics, and The Loss of Genetic Diversity*. Tucson: The University of Arizona Press
- GRAIN, 2007, The end of farm-saved seed? Industry's wish list for the next revision of UPOV, Briefing
- Kloppenborg J. 2008. Seeds, Sovereignty, and the Vía Campesina: Property, and the Promise of Open Source Biology, Paper prepared for the Workshop on Food Sovereignty: Theory, Praxis and Power, November 17-18, 2008
- Lammerts van Bueren, E. T., Soest L. J. M. van, Groot, L. C. de, Boukema, I. W., Osman, A. M., 2005, Broadening the genetic base for better-adapted varieties for organic farming systems: participatory characterisation, evaluation and selection of onion accessions for new base populations. *Euphytica*, 146, 1/2, 125-132
- Lipper L., Anderson L., Dalton T.J. (eds), 2010, *Seed trade in rural market*, FAO.
- Lopez Noriega I., 2009, European legislation in support of home gardens conservation, in Bailey A., Eyzaguirre P., Maggioni L. (eds), *Crop genetic resources in European home gardens*, Bioversity International
- Lorenzetti F., Negri V., 2009. The European seed legislation on conservation varieties, In: Negri V., Veteläinen M. and N. Maxted eds., "European landrace conservation", Bioversity International publ., Rome, Italy

- Louwaars N. and Visser B., 2006, Marketing biodiversity and benefit sharing: a product development perspective, in Bala Ravi S., Hoeschle-Zeledon I., Swaminathan M.S., Frison E. (eds), *Hunger and Poverty: the role of biodiversity*, IPGRI.
- Louwaars N., 2007 *Seeds of Confusion; The impact of policies on seed systems*. PhD dissertation, Wageningen, The Netherlands – with references – with summaries in English and Dutch
- M. S. Wolfe M.S., Baresel J.P., Desclaux D., Goldringer I., Hoad I, Kovacs G., Löschberger F., Miedaner T., Østergaard H., Lammerts van Bueren E.T., 2008, Developments in breeding cereals for organic agriculture, *Euphytica* , 163:323–346
- Melozzi L., 2009, Incentives for agrobiodiversity within the European Union: the role of Rural Development Plans, *Journal of Agriculture and Environment for International Development*, vol. 103 (1/2), Istituto Agronomico per l'Oltremare.
- Menci V. 2007, “Varieta’ locali e prodotti tipici”, Graduation Thesis. Department of plant biology and agro-environmental biotechnology and animal husbandry, University of Perugia.
- Mutersbaugh T., 2005, Just-in-space: certified rural products, labour and quality, and regulatory spaces. *Journal of rural studies* 21: 389-402.
- Naziri D., 2009, Direct sale as a means for promoting the sustainable use of plant genetic resources: the case of the Tuscany Region, *Journal of Agriculture and Environment for International Development*, vol. 103 (1/2), Istituto Agronomico per l'Oltremare.
- Negri V., 2005, Agro-biodiversity conservation in Europe: ethical issues. *Journal of Agricultural and Environment Ethics* 18: 3-25.
- Negri V., Maxted N., Vetelainen M., 2009, European landraces conservation: an introduction, in Vetelainen M., Negri V., Maxted N. (eds), 2009, *European landraces: on-farm conservation, management and use*, Bioversity International.
- Osman A., Chable V., 2009, Inventory of initiatives on seeds of landraces in Europe, *Journal of Agriculture and Environment for International Development*, Istituto Agronomico per l'Oltremare.
- Paoloni L. 2005, *Diritti degli agricoltori e tutela della biodiversità*, Giappichelli Editore, Torino.
- Porfiri, O., Costanza M.T. and Negri, V., 2009. Landrace Inventoring in Italy: the Lazio Regional Law Case Study, In: (Negri V., Vetelainen, M. and N. Maxted eds.) ‘European landrace conservation’, Bioversity International publ., Rome, Italy.
- Salazar, René, Niels Louwaars & Bert Visser, 2007. Protecting Farmers’ New Varieties: New Approaches to Rights on Collective Innovations in Plant Genetic Resources, *World Development* 35(9): 1015 - 1528
- Tansey G., Worsley T., 1995, *The Food System – a guide*, Earthscan.
- Vetelainen M., Negri V., Maxted N. (eds), 2009, *European landraces: on-farm conservation, management and use*, Bioversity International.
- Visser B. 2002, *An Agrobiodiversity Perspective on Seed Policies*, in Louwaars N. ed., *Seed Policy, Legislation and Law: Widening a Narrow Focus*, The Haworth Press.
- Zeven A.C., 1998. Landraces: a review of definitions and classifications, *Euphytica* 104: 127-139.
- Zhu Y, Chen H, Fan J, Wang Y, Li Y, Chen J, Fan JX, Yang Y, Hu L, Leung H, Mew TW, Teng PS, Wang Z, Mundt CC, 2000, Genetic diversity and disease control in rice. *Nature*, 406 : 718-722

Annex

List of the subjects of the Farm Seed Opportunities deliverables

- Descriptions of the breeding initiatives of landraces, amateur and conservation varieties: inventory and case studies
- Definitions and discussion of the concepts linked to the seed laws
- The stakeholders' expectations
- The matches and mismatches of text regulations
- The analysis of DUS requirements
- The potential market for conservation varieties
- Experimental data on landraces, conservation varieties and farm varieties
- Experimental data on seed qualities of farm varieties