The International Treaty
ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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SUBMISSIONS SENT BY CONTRACTING PARTIES, OTHER GOVERNMENTS, AND RELEVANT INSTITUTIONS AND ORGANIZATIONS ON THE IMPLEMENTATION OF ARTICLE 6

Note by the Secretary

This document presents the submission on how to improve sustainable use of plant genetic resources for food and agriculture, including on sectoral policies and best practices for sustainable agriculture, submitted by ACRA (Cooperazione rurale in Africa e America Latina) and consortium partners on 15 March 2013.

The submission is presented in the form and language in which it was received. Minor editorial changes include the full rendering of acronyms and the correction of spelling.

OTHER GOVERNMENTS, AND RELEVANT INSTITUTIONS AND ORGANIZATIONS

ACRA (Cooperazione rurale in Africa e America Latina) and consortium partners

FARMERS' rights in practice
Synthesis of the case studies on sustainable use of agrobiodiversity in Europe

Synthesis of the Case Studies of the Project
Best Practices in Sustainable Agriculture and Food Sovereignty: Development of an Inclusive Approach in the Fight against Poverty

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ACRA assumes all responsibilities for its content, which has not to be considered as a reflexion of European Commission.

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Consortium
ACRA Cooperazione Rurale in Africa e America Latina
ADD Association pour le Developpement Durable Médenine
BEDE Biodiversity Exchange and Diffusion of Experiences
CET Clubul Ecologic Transilvania
CIC Centro Internazionale Crocevia
KDES Kalounayes pour le Développement Economique et Social
PtF Protect the Future (Vedegylet)
RdS Red de Semillas
RSP Reseau des Semences Paysannes
RSR Rete Semi Rurali
SCF Scottish Crofting Federation

English language editing: Maria Luisa Saponaro - Iain MacKinnon
French language editing: Federica Komendant
Graphic Design: Daniela Colantuoni - Chiara Baggio

List of authors
Maria Francesca Nonne - Rete Semi Rurali - researcher and coordinator for the Italian cases
Riccardo Franciolini - Rete Semi Rurali - researcher and editor
Riccardo Bocci - Rete Semi Rurali - researcher and editor
Giuseppe De Santis ACRA - researcher
Csilla Kiss Vedegylet - Protect the Future - researcher and coordinator for the Hungarian cases
Barbara Bodorkos - Protect the Future - researcher
Gyorgyi Bela -Protect the Future - researcher

Dan Craioveanu - Clubul Ecologic Transilvania - researcher and coordinator for the Rumanian cases
Bob Brac de la Perrière - Biodiversity Exchange and Diffusion of Experiences - researcher and coordinator for the France cases
Maria Scholten - Scottish Crofting Federation - researcher and coordinator for the UK cases
Iain MacKinnon - Scottish Crofting Federation - editor
Messaoud Mars - Institut de Chott Meriem Sousse Tunisie researcher
Lazhar Gammoudi - ADD Medenine researcher
Abdelhamid Zammouri - ADD Medenine coordinator for the Tunisian cases
María Carrascosa - Red de semillas Resembrando e Intercambiando - researcher and coordinator for the Spanish cases
Malamine Badji - KDES researcher and coordinator for the Senegalese cases
Mamadou Danfakha - ACRA Senegal researcher

The full version of the document is available at http://www.farmerseeds.org

Executive Summary

The aim of the project *Good Practices in Sustainable Agriculture and Food Sovereignty: Developing an Inclusive Approach in the Fight against Poverty* is to mobilize an operational multi-stakeholder network for a proper implementation of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) of the UN Food and Agricultural Organization (FAO) through promoting small scale and agro-ecological models of agriculture both for EU agro-food sector strategies and for development cooperation in Africa.

The project is implemented by a partnership of non-governmental organizations that work with organizations of small farmers in five European countries - France, Italy, Hungary, Romania and Scotland - and two African – Senegal and Tunisia. The project is coordinated by ACRA from Milan (Italy).

The project provides a collection of case studies of good practices on the sustainable use of PGRFA. This collection is based on the action-research method and was done in 2010 – 2011 in all the countries of the project plus Spain. The focus of the action-research is on agricultural diversity and its relationships with the different functions (e.g. environmental and socio-economic) involved in farm management. The examples of biodiversity and good practices, which are the core and common elements of each case, aim at showing linkages with the measures for the sustainable use of plant genetic resources for food and agriculture as expressed in Article 6 of the ITPGRFA.

The action-research identified 25 case studies in six European countries: four in France, four in Italy, seven in Hungary, four in Romania, four in Scotland and two in Spain. The two Spanish cases have been realized thanks to the external partnership of Red de Semillas. Two case studies identified the actions of local farmers' organizations on PGRFA in Senegal and Tunisia.

This report presents the synthesis of case studies analysed by the action-research activity. The aim is to give a description of the practices carried out by farmers,

individually or collectively, which can be considered as sustainable ways to use plant genetic resources, with the purpose that these practices be spread and exchanged among farmer organizations of Europe and Africa. We consider it critical to bear in mind that the institutionalization of these practices is fundamental to reach an effective food sovereignty and dynamic management of cultivated biodiversity.

To make a strong connection with the FAO Global Plan of Action for Plant Genetic Resources for Food and Agriculture (GPA), the case studies are presented according to the activities foreseen in the GPA under the framework of the sustainable use:

1. Expanding the Characterization, Evaluation and Further Development of Specific Subsets of Collections to Facilitate Use;
2. Supporting Plant Breeding, Genetic Enhancement and Base-broadening Efforts;
3. Promoting Diversification of Crop Production and Broadening Crop Diversity for Sustainable Agriculture;
4. Promoting Development and Commercialization of All Varieties, Primarily Farmers' Varieties/Landraces and Under-utilized Species;
5. Supporting Seed Production and Distribution;

Each bullet will be explained in the report with specific case studies so as to point out how farmers' practices are innovative and in agreement with international policies1. A brief description of the situation in the countries involved in the project will be presented in order to better understand case studies and their social context.

Introduction

Seeds, biodiversity, farmers' rights and sustainable use: the report herein wants to clarify these terms and underline how local realities produce innovation describing some best practices that define these concepts in different and original ways. We are not talking about a mere conservation of agricultural diversity; instead we argue that crop diversity is the key to rebuild local realities and re-think the concept of modernity and progress in agriculture.

The other pillar on which rests the above mentioned best practices is the collective action that emphasizes how circulating and networking knowledge and seeds are essential to produce innovation. In these contexts, tradition is not seen as a glorious past but as a way of constructing a collective identity from local resources.

Making this innovation emerge has not only a symbolic value. It is neither about giving awards to someone nor about proposing a model applicable to everybody and in every social, cultural and environmental context. The challenge is to represent and describe the social and crop richness that is present in local territories and that is largely invisible to policy makers and politicians.

The ambition is to outline new policies and regulations that take into account all facets of the real, instead of reducing reality to a monoculture. Unfortunately, agricultural

[1] For a complete description of all the case studies please go to Action-Research Report *Good practices in sustainable agriculture and Food Sovereignty: developing an inclusive approach in fighting against poverty.*

policies have been and continue to be a way to change reality by imposing a single model of modernity and progress named industrial agriculture.

This choice to follow this single model is based on a narrow economic ideology, masked behind the veil of an alleged technicality, scientism and neutrality that animates national and European legislators and which, in fact, tends to reinforce the commercial and political monopolies that control the food chain.

Actually, as written by Lang *et al*. (2009) «Food policy is made, not given. It is a social construct, not ordained by a pre-programmed, perpetual or externally affirmed human order.» Therefore, public policies concerning agriculture can be successfully reformulated on the basis of national / regional needs and their creation is the result of the negotiation of multiple and diverse actors and interests and their relative balance of power.

The report herein explicitly wants to give voice and strength to a different modernity in the countryside in order to redefine, build and program the public space.

The European Framework

In a political context, the best practices narrated in this report make these case studies highly relevant as they are in line with what it is written in European strategies and international treaties. This comparison between words and actions is necessary to emphasize their discrepancy and how, sometimes, the answer to many questions is hidden in our backyard; we just should have the courage to look at it.

Biodiversity has become a central and crosscutting theme in all EU policies. Its conservation is a mantra repeated in almost all official documents and reproduced in thousands of glossy pages on the subject. Unfortunately, such media attention does not correspond to many tangible successes. In fact, the ambitious target of halting biodiversity loss by 2010 – decided in Sweden in 2001 – was reconsidered in 2011 and moved to the time horizon of 2020.

Moving the achievement of this target further away in time was the only possible solution given the report submitted by the Commission in January 2010 entitled "Solutions for a vision and an objective relating to biodiversity after 2010", which stated «In Europe, conservation assessments of species and habitats show that, despite some successes, the overall situation has continued to deteriorate. [..] In the case of ecosystem services in the EU, there is, for instance, evidence that the carbon storage capacity of certain soils in arable land, which are heavily dependent on soil biodiversity, is decreasing.» (EC 2010: 3)

Hence, the new European strategy on biodiversity for 2020 (EC 2012a), approved by the Council in June 2011, with six specific objectives to be achieved:

1. Full implementation of EU legislation to protect biodiversity;
2. Better protection for ecosystems and greater use of green infrastructure;
3. More sustainable agriculture and forestry;
4. Better management of fish stocks;
5. Tighter controls on invasive alien species;

6. Greater EU contribution to the prevention of biodiversity loss worldwide.

In this new scenario agriculture plays an important role. The impact of agriculture on biodiversity – natural and agricultural – is increasingly evident. All sectoral policies, such as the Common Agricultural Policy (CAP), will be redesigned to take into account these priorities. Within them the EU has identified a series of specific actions including one dedicated to the preservation of agricultural genetic diversity (Action 10). An example of the need to integrate all sectoral policies may be the process of revising the regulations concerning seeds brought forward by the Directorate General Health and Consumers (DG SANCO) since 2009. Increasing agricultural productivity through the use of improved varieties is no longer the one key driver of agricultural policy. Among the new targets, which will form the basis of future legislation, are also provisions for the conservation of agricultural biodiversity, environmental protection and environmentally friendly agricultural patterns such as organic farming.

This marks a Copernican revolution for a legal system that until today has been a transmission belt for industrial agriculture. It comes with an important recognition, as it implicitly states that the seed regulation since the early '60s has contributed to the erosion of genetic agricultural diversity and therefore should be changed. (EC 2012b)

But the drivers for change come not only from within. There is a thin red thread that ties European and international policies on agricultural biodiversity, whose targets on conservation and sustainability, at least on paper, have become an overarching objective to sustain. The EU and its member states have signed the ITPGRFA adopting some of the obligations contained therein. (UN FAO 2009a) In particular we wish to draw attention to Article (Art.) 6 on sustainable use of agricultural diversity.

Unlike other articles of the Treaty, this provision applies to all resources – not just those included in the list of *Annex I* – and must be respected by all Contracting Parties without limitations due to national legislation, as is the case with the Farmers' rights described in Art. 9 or with Conservation, where Art. 5.1 explicitly states «subject to national legislation.»

Art. 6 is based on the priority areas identified by the GPA for the Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture (PGRFA), adopted at the International Technical Conference on Plant Genetic Resources in Leipzig in 1996 and recently revised and approved by the FAO Council in November 2011.

In particular, Art. 6.1 forms an obligation on the Contracting Parties. It states: «The Contracting Parties shall develop and maintain appropriate policy and legal measures that promote sustainable use of plant genetic resources for food and agriculture.» The rest of the article identifies some of the possible measures that States can take to promote the sustainable use of PGRFA, but this list has only illustrative purposes and does not limit the States in implementing the actions they deem most appropriate for this purpose, following what is written in the much larger GPA.

The importance of Art. 6 was reaffirmed during the Treaty's Governing Body meetings in Rome in 2007 and in Tunis in 2009, up to the delivery of a specific resolution (7/2011), which was approved in March 2011, at the Fourth meeting in Bali.

What does Art. 6 mean by sustainable use? What actions or activities should be promoted by appropriate public policies to support it? These questions are highly relevant and not easy to answer. Depending on one's point of view, the adjective sustainable may have different meanings. For example, according to Germany – the only European country to have written a national report on Art. 6 for the Governing Body meeting in Tunis – sustainable use means to use agricultural diversity in the processes of breeding programs only. The German report, in fact, mentions only public and private seed companies and defines agrobiodiversity as «the most important and valuable natural resource for these processes.» (UN FAO 2009b) Thus, agricultural diversity is seen as a natural resource and not as the product of a thousand-year-old selection of farmers, who are given no role in making sustainable use of diversity. This is a point of view that is very far from the one described in this report and illustrated by the best practices described in later chapters.

Given these interpretative difficulties, in the resolution of Bali the Treaty's Governing Body has established an ad hoc technical working group to give some consistent guidelines with the objective of creating a work plan and a toolbox in order to organize tools for sustainable use of biodiversity.

The best practices selected in the following pages are already a work program and outline what farming communities mean by sustainable use. The report highlights another key aspect for sustainable use of PGRFA: relations with the market and valorisation of the produce, the so-called conservation through use.

Many good practices, in fact, insist on the link between conservation, use and valorisation, with particular attention to the relationship between diversity and culture and the creation of markets suitable for the product that is being sold. (Lockie and Carpenter 2010) In this case the specific reference is directly to the Global Plan of Action and its section 14 «Developing new markets for local varieties and diversity rich products.» This measure is not explicitly contained in Art. 6, but is the cornerstone on which to set the sustainable use of genetic resources. Section 14, in addition to the importance of having markets suited to local varieties or products of agricultural biodiversity, also emphasizes the public awareness, including schools, on the importance of agricultural biodiversity. (Platform for Agrobiodiversity Research 2010)

From Sustainable Use to Farmers' Rights

The case studies described in the report present different facets by which the sustainable use of PGRFA can be defined. Our in-depth analysis shows how slender the boundary is separating Art. 6 from Art. 9; that is, between the objective of sustainable use of PGRFA and actions for the realization of farmers' rights.

The issue of their connection is not irrelevant. Farmers' rights, in fact, is a "hot" topic in both domestic and international negotiations and its application is still subject to national legislation. In contrast, according to the wording of the Treaty, sustainable use has no such limitations and for this reason it should be more easily implemented by the Contracting Parties (CP). To better understand the possible links between these two articles we have tried to establish logical connections between them.

Art. 9.3 is one of the most controversial articles and states that national legislation

will decide on the right of farmers to exchange, use and sell reproductive material. Art. 9 has a close relationship with Art. 6.2 (a) and (g), i.e. with policies designed to promote agricultural systems that maintain genetic resources in a sustainable manner and with changes in laws and regulations concerning the creation of plant varieties.

In our interpretation, the possibility of having diverse farming systems (Art.6.2.a) is linked also to a different seed system than the current one; a different system in which there is more space dedicated to the role of farmers allowing exchange, reuse and sale of propagating material. In addition, exchange and reuse of seeds by farmers can be interpreted as actions needed for the testing of new varieties outside of the dominant commercial channels and in line with the objective to review and harmonize the rules on the release of the varieties and strategies of genetic improvement.

Art. 9.2 (a) on the protection and sharing of traditional knowledge can be developed in conjunction with Art. 6.2 (e) that promotes the use of local varieties and underutilized species. Art. 9.2 (b) concerning measures for 'sharing benefits' is very broad and its application follows the meaning that one wants to give to ' benefit sharing'.

If we consider monetary benefits only, we may end up talking about subsidies for local varieties production, at least in the vision that we can give based on European experience. If we consider non-monetary benefits, the vision widens and, generally speaking, sustainable use of agricultural biodiversity becomes a mechanism for benefit sharing.

In particular, the promotion strategies of Participatory Plant Breeding (PPB) for the benefit of farmers' needs, which facilitate their access to genetic resources and broaden the range of varieties available, are all actions that can be interpreted as compensation mechanisms for farmers. For this reason, Art. 9.2 (b) can be compared to Art. 6.2 (b) (c) (d) concerning participatory research and access to genetic resources for farmers. (Bocci and Chiari, 2009)

This analysis of the connections between Arts. 6 and 9 can be very useful both nationally and internationally for advocacy and lobbying actions. In fact, opening a space for negotiations with institutions on the sustainable use of agricultural biodiversity is much easier than on farmers' rights and, indeed, absolutely mandatory for the Contracting Parties (see the case studies of Switzerland and Italy).

It becomes a powerful and valuable tool in the hands of civil society working on conservation and sustainable use of agricultural diversity. Moreover, the resolution 6/2011 approved in Bali by the Governing Body on farmers' rights explicitly «Encourages each Contracting Party to closely relate the realization of Farmers' Rights as appropriate and subject to national legislation with the implementation of Articles 5 and 6, in particular the measures in Articles 5.1(c and d), and 6.2 (c, d, e, f, and g).» (UN FAO 2011: 3)

At last, after four meetings of the governing body, a breakthrough was also made on the diplomatic side.

In conclusion, experiences on the ground in different territories are often far more advanced than the policies that affect them; and the analysis of these experiences can

highlight innovations resulting from interactions between different actors and the many factors that interact at the local level: social, environmental, economic, cultural ... (Van der Ploeg 2008) How to maintain this true art of the local reality is the challenge that this report throws into the political arena.

Country Profiles

France

For over fifty years, the seed industry has played a central role in French farmers' economic and legal environment. With a turnover of almost 2 billion euros France is Europe's leading producer of seeds. The most produced crops are wheat (83,000 ha), maize (40,000 ha) and barley (37,000 ha), followed by potatoes (16,000 ha) tomatoes (15,000 ha), sunflower and peas (9,000 ha each). Cereals – soft and durum wheat, barley, oats, rye, triticale, rice, buckwheat, spelt – are the main crop in France, which is the leading producer in Europe with more than 7 million ha. Cereal seeds are produced by 80 companies and 8,000 seed growers.

France also cultivates corn on its territory, comprising a total of 25 per cent of the European production area and nearly 3 million ha. At 641 million euros, corn seed sales represent the biggest business within the seed sector (32 per cent of total turnover), much of which is aimed at export (41 per cent). Research on corn is very dynamic, with a hundred of new varieties created each year by 13 breeding companies.

France is the third largest producer of vegetables in the EU, following Italy and Spain, and also a major producer of vegetables for the food industry. Vegetable seeds, together with garden and floral vegetables, represent 25 per cent of the seed market. There are 27 production companies and 2,200 seed growers involved in this sector, mainly located in the Pays de la Loire region and in the southeast.

Thanks to its agricultural tradition and colonial history, as well as its policy of plants' exploration, acclimatization, and breeding, France has a huge richness of genetic resources for all of the crops, both temperate and tropical.

The seed industry's influence is very strong in every field related to genetic resources, and it pushes for ex-situ conservation and evaluation of genetic resources. Meanwhile, on-farm conservation and the role of farmers are virtually denied.

The Bureau of Genetic Resources (BGR), created at the end of the last century, adopted a national strategy whose principles are set out in the National Charter of Genetic Resources' Management. What is surprising is that there is no national gene bank in France, unlike other major industrialised countries. Conservation of genetic resources is ensured mainly by the appointed departments of agricultural research that share responsibilities and tasks. They cooperate through networks and a platform. These activities take place within various international programs under the aegis of FAO, ECP/GR and EUFORGEN.

The National Charter of Genetic Resources reveals the official position held in 1999 by the French government on the role of farmers in farm conservation of crop diversity:

«…Farm conservation is of great international interest, but (...) In France, where the organization of the seed industry followed the evolution of the agricultural world, farm conservation, as defined on an international level, does not seem to play a significant role. It is performed today for the maintenance of some local varieties who comprise a wide variety of species, and to support local products (old varieties of vegetables, fruit trees spread by amateurs, etc.). It should be underlined the absence of real guarantees in regard to the genetic identity and stability of the maintained resources.»

Two major events helped to put French policy in the fore-front of the issue of genetic resources, thus creating extra room to raise problems related to the dynamic management of crop biodiversity on farms: the birth of the Peasant Seed Network (PSN) in 2003 and the creation in 2009 of the Foundation for Research on Biodiversity (FRB).

To date, the PSN coordinates the revitalization of farmers' seed at the national level. It was born within civil society in 2003 as an initiative of farmers' and organic agriculture organizations against the political powers' refusal of any discussion on how to adapt the cultivation system of new varieties to the ecological farmers' cultivation methods. The Peasant Confederation, Nature and Progress, the Biodynamic Movement and the National Federation of Organic Agriculture are the founding members. These organizations brought together and directly involved economic actors - individual and institutional. It is the development of economic activities through their networking (soil work, sub-groups on wheat, corn, vegetables, fruit, etc.), the communication on this work, and its challenge to civil society that created a new balance of power, and which has opened a political dialogue.

At the same time, the public researchers approached the PSN and started participatory research and breeding programs. The social innovation stemming from the new relations between farmers, civil society associations and researchers, the new links with the non-peasant social movement (Collective Semons la biodiversité, and the support of NGOs such as Amis de la Terre), and the expansion of PSN's international activities radically changed the power balance with policy makers.

The Foundation for Research on Biodiversity (FRB) includes and expands on the tasks of BRG to promote the development, support and facilitation of research activities on biodiversity and its development. Its founders are eight public research organizations involved in biodiversity research: CEMAGREF, ICARD, NCSR, *FRIES*, NIAR, DRI, NMNH and BGMR. The ambition of the departments and agencies responsible for the Foundation is to build a platform of exchange for all biodiversity stakeholders in France - companies, associations, NGOs - and enhance research on biological, socio-economic and legal issues.

Despite the great work, the current legal framework for the dissemination of farmers' seeds still remains difficult. Under French law, the seeds that don't belong to one of the *«varieties inscribed on a list of the Official Catalogue of crops or on an adjunct register»* do not have the right to be marketed (Decree 81-605) [2]. The

[2] Decree No. 81-605 of 18 May 1981 made for the purposes of the Act of 1 August 1905 on fraud prevention in relation to seeds trade and plants art. 2 « I. -

definition of «marketing» (the seeds, not their products) is relatively large since it includes any exchange either paid or free of charge. There are some exceptions and limitations that define the space of legal existence for farmers' seeds:

i) it is legal to sell seed varieties not included in the catalogues only if they are for non-commercial use, as self-consumption (amateur use), conservation, research, selection, training. The seller must clearly indicate that the quality of the seed sold is not aimed at commercial exploitation;
ii) the supply of seed for a service aimed at processing or packaging is specifically excluded from marketing[3] ;
iii) the exchange of plant genetic resources aimed at research and selection is also excluded from the regulation on seed marketing. These exchanges take place today within an almost total legal vacuum: the Convention on Biological Diversity (CBD) and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), which represent the international frame, have not been yet transcribed into French law. Only the genetic resources derived from collections included in the ITPGRFA multilateral system must be the object of genetic Material Transfer Agreement (MTA), and those which give rise to the filing of a patent are subjected to a mandatory contribution to the benefit sharing fund;
iv) a fourth exception to the catalogue's listing requirements is the sale of seeds holding no indication of variety. This article provides an opportunity for the dissemination of varieties not included in the catalogue, knowing that such seeds still remain subjected to other regulations on seed marketing.

These exceptions are however not well known and their implementation is complex. This allows supervisors to perform intimidation in order to prevent seeds exchange among farmers and sales of seeds whose varieties are not listed. Only the most knowledgeable operators, thanks to PSN's legal communication, manage today to enforce their rights without falling into the trap. Besides this general framework and its exceptions, there are still specific marketing frameworks for *«in situ conservation and sustainable use of plants' genetic resources, seeds or plants adapted to organic cultivation, blending of genres, species or varieties.»*[4] To date, these conditions are defined only for mixed fodders, conservation varieties of agricultural plants and potatoes.

May not be marketed in France under the term "seed" or "plants" followed by a qualification that do not meet the following conditions: 1 belongs to one of the varieties included in the Crop Official Catalogue or, failing that, to an adjunct register in accordance with articles 5 to 8 below. This condition is not required for seeds and plants sold without any indication of variety. (…) »

[3] Art 1-1 « It does not fall within the definition of trade the seeds exchange not aimed at commercial exploitation, such as the following: provision of seed for official testing and inspection, seed supply to service providers, seed processing or packaging, provided that the service provider does not acquire any title on the seeds. The seed supply to service providers aimed at the production of agricultural raw materials for industrial use or for the reproduction of seeds is not to be considered marketing, provided that the service provider does not acquire title on either the supplied seeds or the harvested product. »

[4] Idem art. 3-1 «Specific marketing conditions are set , by order of the Minister of Agriculture, in regard to: - (...) - in situ conservation and sustainable use of plant genetic resources; - seeds or plants adapted to organic farming : - mixtures of genera, species, and varieties».

The conditions relating to organic farming or other mixtures have yet to be defined.

Hungary

The main criteria for selecting the case studies were that they are collective initiatives that are already functioning successfully with, additionally, an attempt to include both subsistence and market-oriented initiatives. Another important criterion was to cover collective actions focusing on a diversity of species, including fruits, vegetables, cereals and fodder.

Despite the valuable role these initiatives play, they are operating in a legal, institutional and economic context that, overall, is not favourable for them.

In Hungary there is no comprehensive national strategy and action plan for the conservation and renewal of agricultural biodiversity. For example, the agro-environmental program (axis two) of the new Hungarian Rural Development Program that offers financial compensation for the cultivation of rare, endangered, genetically and culturally valuable landraces is not harmonised with the register of conservation varieties. The implementation of the EU directives 2008/62 and 2009/145 on the acceptance and marketing of seeds of field crops and vegetables is also problematic. The Distinct, Uniform and Stable (DUS) criteria applied to conservation varieties is not sufficiently flexible and continues to exclude many local varieties. By November 2010 no landrace has been registered on the national catalogue for conservation varieties. Despite the adaptation of rules from European Directives into Hungarian law, exemptions have not been introduced for small producers.

Regarding the UPOV Hungary rapidly adopted the 1991 convention, which severely restricts farmers' rights to farm-saved seeds, under the pretext of protecting the national breeding industry. But today the national breeding sector is in sharp decline and even marginal. At the same time the Hungarian Seed Association (*Vetőmag Szövetség és Terméktanács*), representing the interests of breeders and seed producers, launched a campaign against the use of farm-saved seed and for the collection of royalties.

Many local varieties and landraces have disappeared from cultivation and are available only in gene banks. The regeneration of these local varieties under in situ/on-farm conditions is key for the conservation and renewal of agricultural biodiversity. This belief is also spreading among the majority of gene banks and research institutes that collaborate with local communities and farmers both by providing seed samples and, occasionally, technical advice. There are insufficient funds for these research programs and the existing programs depend on the individual professional motivation of the researcher involved.

The case studies indicate that considerable knowledge linked to the sustainable use of plant genetic resources for food and agriculture has been lost and there is an important need for training on cultivation techniques of special, underutilized crops and local varieties, seed multiplication and selection techniques and other related know-how.

In general, there are few financial resources and support schemes for collective initiatives working on the conservation and renewal of agricultural biodiversity on farms. The available funding or programs are often short-term, insecure and difficult to access

by small farmers.
Despite a hostile legal, institutional and economic context, different stakeholders are able to cooperate on concrete examples to implement the sustainable use of plant genetic resources for food and agriculture on farms.

Scotland

In Scotland, field crop landraces have survived on the very margins of Europe in a uniquely Scottish combination of remote islands and peasant agriculture - small holders or peasants are known as 'crofters'- in a specific biophysical environment. Barley, oat, rye and cabbage landraces and many heritage potato varieties are maintained because of their local adaptation to the harsh environments of the northwestern Atlantic Ocean. Proximity to seas and ocean has conveyed tolerance to salt spray and high winds in these varieties. The landraces are also well suited to the small-scale forms of crofters' agriculture, characterized by a low-input low-output extensive pastoralism in a highly variable environment.

Thus, a very distinct form of North-Atlantic agrobiodiversity has been maintained by crofters. Centuries long cultivation has left its mark on local traditional culture with story and song expressing a rich testimony to local varieties. Low-input cultivation has to the present day maintained a wealth of bird, flower and insect wildlife rare in the UK. Arable weeds extinct in mainland Britain can still be found in abundance here. The field landraces form a cheap home grown feed for cattle or sheep and seeds of the landraces are produced locally and are not in commerce. Rare animal breeds are maintained on the islands.

Sustainability of agrobiodiversity is at stake as crofting communities face many challenges related to economic and demographic sustainability.

Scotland has since 1999 gained devolved authorities from London and has its own responsibility for biodiversity and the implementation of ITGRFA. However, the latter has not happened yet and initiatives in relation to Article 6 of the ITGRFA, especially the development of policy, as in art 6.1 are regional. However, other actions recommended in the Global Plan of Action such as the integration of *ex situ* and *in situ* conservation and surveying and monitoring have made more progress and resulted in an *ex situ* collection of Scottish landraces (www.scottishlandraces.org.uk).

Rural Scotland as a whole is characterized by mountainous terrain, harsh climatic conditions and a low population density. Most agricultural land is used for rough grazing and 85 per cent is classified as Less Favoured Area. Ten per cent of the total landmass in Scotland is under crofting tenure, 770,000 ha in total. In 2012 there were 18,027 crofts with between 10,000 to 12,000 crofters. (Crofting Commission 2012)

A croft is an agricultural smallholding in one of the seven Crofting Counties in Northern Scotland. Crofting is a system of land tenure regulated through legislation, the so-called Crofting Acts. The average size of a croft is around five ha, but some are only 0.5 ha while a few extend to more than 50 ha of land, often with a share in common hill grazing which is held in common with other crofters in a township.

The Scottish Crofting Federation (SCF) is the only member-led organization

representing and lobbying for crofters and forms the largest organization of small-scale food producers in Scotland. Most crofts cannot support a family or give full-time employment. Many crofters have diversified into small-scale tourism and off-croft employment is common.

Addressing the long term sustainability of crofting and raising awareness about and promoting wider use of landraces among the next generation of crofters is done through the educational project Crofting Connections, conducted by SCF and the Soil Association. Raising awareness about, promoting the use of and exploring new niche markets for landraces has also been included in the Crofting Resources Program of the SCF. Action research was conducted on farm to document and describe the diversity of the Scottish infra-and interspecific oat diversity.

The examples given relate to promoting the wider use of local varieties. Given the relatively low number of varieties and few and geographically marginal growers of Scottish landraces, the lack of a local landraces growers' lobby group and the lack of awareness about landraces at local, regional and national level, raising awareness is the most urgent and most logical first step before other good practices can be achieved.

Romania

On the occasion of the Convention on Biological Diversity, Romania was presented as "the most biogeographically diverse country of the EU"[5], due to its Central European geographic location, its temperate climate, diverse relief and rich soil features. Romania is the European country with the highest number of people working in the agricultural sector, almost five times higher than the average at the EU level.

The average size of an agricultural exploitation in Romania is only 3.3 ha. Therefore, Romania's agriculture has been characterised as an agriculture full of contrasts[6]. It is scene both for small farmers who possess less than 1 ha of land (2.6million households) and for industrial agricultural holdings as well (9,600 farms of over 100 ha). Figures show that almost half of European smallholdings (48 per cent) practice subsistence agriculture.

For the great majority of Romanian farmers, agriculture based on low-inputs is the key element of security and earning a living. Traditional agrosystems have a high significance in the rural landscape, as these are the most important depositories of intra and inter-specific agricultural diversity (Strajeru et al. 2009).

Founded in 1990, Suceava Gene bank has been maybe one of the most important Romanian institutions regarding the collection and in-situ conservation of plant genetic resources, and a key organ in applying the measures of the International Treaty on Genetic Plant Resources for Food and Agriculture (ITGPRFA). The Bank owns more than 15,620 samples from 340 plant species, many of them representing traditional varieties, which are on the verge of extinction.

Many Romanian farmers are directly and actively involved in the *in situ*

5 http://www.cbd.int/countries/profile.shtml?country=ro#status

6 *O tara si doua agriculturi, Romania si reforma Politicii Agricole Comune*

conservation of different plant species by cultivating diverse local varieties of cereals, vegetables, industrial and technical plants, and also pharmaceutical plants (Ibanescu et al. 2002). These landraces are cultivated in either their own fields or home gardens, in order to meet the particular needs and preferences of the grower[7].

Among the species with the richest genetic diversity are potatoes, beans and corn, although we encounter a high local diversity of pharmaceutical plants and vegetables. These authentic, so-called "primitive", species are subject to a high degree of genetic erosion because of their replacement with new modern species, but also because of the transformations that occur in agricultural methods and of the destruction of habitats and ecosystems (Strajeru et al. 2009).

From this point of view, the most dramatic situation is that of the fiber crops such as flax and hemp, for which the local varieties are almost non-existent. The same decline has happened to *Triticum monococcum,* a wheat species that up until 1994 could have been easily found in Transylvanian villages. Among the advantages of these species are their adaptability to extreme weather conditions and resistance against rust or high tolerance to pests. Only one type of *T. Monococcum* has been identified in 2007, in Alba county (Strajeru et al. 2009). Other local cereal varieties are also on the verge of extinction because of the hybrids and modern species with high productivity that are now used. Genetic erosion of potatoes is even more dramatic. On the opposite pole there lies the bean, with an average of ten local varieties per farm encountered in Maramures area, where cultivated land holdings are very small (Strajeru et al. 2009).

The Romanian Parliament has adopted the International Treaty on Genetic Plant Resources for Food and Agriculture by Law no 42 of 17 March 2005. The law contains only one Article and establishes neither any plan of action nor any competent authority in charge of the implementation of the Treaty's requirements. During the parliamentary debates of the Chamber of Deputies of February 7th 2005, in which the bill regarding adoption of the Treaty was passed, Valeriu Tabara, currently the Romanian Minister for Agriculture and Rural Development, expressed his opinion about the Treaty. He said it "represents the basis for top research and investigation, including on genetically modified organisms".[8] This statement shows clearly the way in which Romanian authorities understand the importance of the conservation of plant genetic resources.

The Common Agricultural Policy in Romania is translated into subsidies for producers and financial support for rural development. Farmers receive funds according to the cultivated area and most of the subsidies have gone to industrial farms: in 2008, 0.9 per cent of the holdings over 100 ha received 51 per cent of all subsidies. (Luca et al. 2009)

As a consequence of a Restructuring Program of the Agencies and Structures under the Ministry of Agriculture and Rural Development, the Suceava gene bank has been dissolved and taken over by the Central Laboratory for Seed Quality and Seed Material[9]. The gene bank collections total 15,620 accessions, belonging to 340 plant species that are extremely valuable sources of genetic diversity. This means that Suceava

7 Biodiversity International: Biodiversity Technical bulletin no. 1, p. 137

8 http://m.cdep.ro/pls/steno/steno.stenograma?ids=5798&idm=5&idl=2

9 http://www.madr.ro/pages/view_presa.php?id=2646

gene bank is no longer a distinct entity, but has lost its judicial personality, which is a real threat to its activities that were mainly funded through external sources. In an interview for a Romanian newspaper[10] Silvia Strajeru, director of the gene bank, has characterized this measure as illegal and considers that it disturbs the activities meant for conservation of plant genetic resources.

The Program for Rural Development 2007-2013 only takes into account some aspects of biodiversity: protected natural areas, maintenance of a high value of the arable land, preservation of the wild plant and animal resources. Although a Catalogue for Romanian Plant varieties was drafted in 2008 and adopted through Order no. 427/2008 of the Ministry of Agriculture and Rural Development, there is no record of a similar catalogue for traditional varieties. Financial support was granted through Measure 214 – Agri-environmental payments. There is no information on whether any of these funds were used to directly implement the ITPGRFA.[11]

On 22nd May 2010, on the occasion of the International Day for Biological Diversity, the Ministry of the Environment announced the "National Strategy and Plan of Action for Biodiversity". This strategy has a plan of actions, and the costs for its implementation will rise to more than 1 billion euros for the period of 2010-2020. This Strategy acknowledges the existence of several agro-biodiversity related problems at the level of national policies. These include: the fact that the concept of agro-biodiversity has not been introduced into national politics in the real meaning of the term; agricultural subsidies do not take into account biodiversity conservation principles; there is no inventory of traditional varieties and species; there are no incentives for certification and promotion of traditional plant or animal species; there is a lack of any conservation programmes for traditional plant or animal species; there is a lack of any national agricultural policy to stimulate the diversification of crop types by encouraging production and consumption of plants with unused agricultural potential. Even if all these issues are stated in the strategy as being real and urgent there are no clear measures to solve them among the objectives of the Strategy[12].

In order to successfully conserve the agricultural heritage in-situ, Romania needs urgent governmental actions and measures, and also a well-developed and sustainable national strategy regarding in-situ conservation, with the direct and active involvement of farmers.

Italy

Italy ratified the Convention on Biological Diversity (CBD) in 1994, but drafting the required National Plan for Biodiversity was lengthy and difficult because of the lack of coordination among the Ministries involved. In 2004 Italy also ratified the Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) with an ad hoc law that devolved the power to implement it to the Regions. This launched a phase of negotiation

[10] http://www.agerpressnet.ro/prim-plan-suceava/4266-banca-de-gene-de-la-suceava-scoas-din-circuitul-cercetrii-naionale-i-internaionale-de-o-decizie-pripit-i-injust-a-ministerului-agriculturii-.html

[11] Axa 2 *Îmbunătăţirea calităţii mediului şi a zonelor rurale* http://www.apia.org.ro/iacs_masuri_delegate.htm

[12] *Strategia Naţională pentru Biodiversitate şi Planul de Acţiune*, cap. D.4., Agricultură p. 75-76

between regional and national governments, which ended in 2008 with the approval of the National Plan for Agricultural Biodiversity (PNBA). The PNBA will provide a national framework for the initiatives that private and public subjects had carried out at local, regional and interregional levels entitling them to inclusion within the European and international legislative context. The first phase of the PNBA has recently been concluded with the release of the National Guidelines for the Conservation of Agricultural Diversity that take into consideration agricultural species, vegetables, fruit trees, animals and microorganisms.

The implementation of the Treaty is delegated to four different institutions: Ministry of Foreign Affairs, Ministry of Agricultural, Food and Forest Policies (MiPAAF), Environment Ministry and Regional Authorities. The latter authorities, according to law 101 (2004), have a duty to implement the Treaty articles 5, 6, 9, 11 and 12. The role of the MiPAAF is to report at an international level about the Treaty implementation status and to monitor the regional offices' actions. The National Project "Risorse Genetiche Vegetali/FAO" (RGV/FAO) was set up in 2004 to guarantee ex-situ conservation, cataloguing and characterizing Italian agricultural diversity (not limited to the species listed in Annex 1) through collaboration with research centres belonging to MiPAAF and the Ministry of Research and University. Since 2007, MiPAAF has extended the scope of the original project to include the activities of the so-called informal sector and to start dissemination to the whole society. To do so, the association "Rete Semi Rurali" has become involved in the RGV/FAO project in order to provide information, dissemination and training about the Treaty objectives and consolidate the informal conservation system adopted by farmers and associations across different territories in the country.

Analysing statistical data about the Italian farming system, one has the impression the country holds a position between tradition and modernity where farming activity, despite having a marginal residual national economic importance, still retains its importance for a wide portion of the population. Despite the number of farming workers falling below one million units in the last few years, Italy still holds firmly third place in Europe after Romania and Poland. In terms of the number of employees in farms working in the whole food sector, Italy still retains a firm third place after Romania and Poland. It is interesting to note that Italian agriculture is still mainly dominated by small farms: small farms with less than 10 ha represent 85 per cent of the total number of farms. Farms with more than 50 ha represent only 2.2 per cent of the total in numerical terms and add up to only 5.6 per cent of the overall Utilized Arable Land (UAA).

Analysing the economic dimension of Italian agriculture, the sector presents two strong poles. On one hand, there are farms technically described as "enterprises" and on the other hand there is still the presence of companies not defined, in European terms, as "enterprises". Data from 2000 shows that 82.8 per cent of farms have an economic dimension smaller than eight European Dimension Unities (UDE) and 55 per cent are smaller than two UDE. Farms larger than 16 UDE, the threshold above which the farms are market oriented "enterprises", represent only 9.5 per cent of the total (Nomisma, 2008).

Consideration of workers' average age also helps to give a better understand of the Italian farming system: according to the 2005 Eurostat data, in Italy only 3.5 per cent of workers are younger than 35 years against a European average of 6.9 per cent, and the

number of farmers older than 64 years is 41.4 percent. The generational turnover index for Italy is the lowest across all the European countries except Portugal (Nomisma, 2008). After an in depth analysis of the generation groups in relation to farms sizes, it emerges that the largest group of older people work for the smaller farms with less than eight UDE.

From data analysis carried out on high quality produce and on geographical designations (PDO, PGI and STG) the landscape changes dramatically. Italy has become a powerhouse in Europe with 217 certified productions in 2011 representing the 21 per cent of the European total followed by France with 182 and Spain with 146. Geographical designations are a strong link between the underlying territory, the culture and agriculture and their presence in Italy is a demonstration of the importance of this link as a driving factor in present day economic agricultural development.

In summary, the general situation is one of an agricultural sector balanced between tradition and modernization where in everyday life farmers are trying to find new solutions in order to operate in the sector.

Case Studies – Following the five Objectives of the FAO Global Plan of Action

1. Expanding the Characterization, Evaluation and Number of Core Collections to Facilitate Use

Sicily: Symbiosis Between Formal and Informal Systems - Italy

When we speak of Sicilian wheat, we normally mean durum wheat, for which Sicily constitutes the centre of secondary diversity. The evolution of durum wheat and its variability are related to the different conditions under which it is grown, not only from place to place but also from year to year. In these different environmental situations, a large number of durum wheat landraces have been the subject of scientific studies since as early as 1803. The diffusion and conservation of their diversity was related to the traditional production of different breads (Blanciforti 2010).

In 1942, professor Ugo De Cillis, director of the Experimental Station of Grain Culture for Sicily, and his team collected and classified, in only one year of research on the field, 341 samples[13] including 45 local varieties of which 34 were wheat (De Cillo, 1942). The Station has managed not only to preserve the collection of De Cillis both ex-situ and in-field, but also to carry out its reclassification and collect new accessions through field visits (see Table One).

Today, thanks to the farmers who have maintained some landraces in the field and to the work of the Station, it can be said that Sicily has again a great collection of wheats. This heritage is composed of 164 accessions of which more than 90 per cent is represented by landraces. Most of the accessions were recovered from Gene Banks (72

[13] U. De Cillis, Frumenti Siciliani, Catania 1942, 2004. The survey was among the objectives of the Station since its establishment (1927), and was launched in 1931 with poor results. In 1942 Prof. Ugo De Cillis and his team, driven by the need to contribute to the battle of the wheat in the study of local varieties, decided to abandon previous strategies for sample collection and started visiting each farmer in person.

accessions), or derive from the direct donation of resources by farmers or active parties in the areas (39) and the work of technicians in collaboration with farmers (12).

Table One - Germoplasm accessions of durum and soft wheat

Total no of accessions	**164**
Total no of varieties	**68**
No of varieties deriving from the ones identified in the '30s and '40s by De Cillis	**44**
No of new LVvarieties identified from 1999 onwards	**15**
No of varieties identified in the '40s and '50s	**6**
No of modern LV identified from the '70s onwards	**3**

Source: own analysis of records provided by S. Blangiforti (2010*)*

The conservation and, consequently, the use and dissemination of these accessions, came about thanks to the presence of a collective access to resources.

Farmers and processors played a key role in the dissemination of landraces. A range of mechanisms of communication and exchange for both information and materials were used. The Station gives to farmers, single or in association, small amounts of seeds that the farmer multiplies over the years in order to get to their own productions; the quantity of varieties is in accordance with the farmers' ability to reproduce them. The program includes testing the finish product. The Station manages some experimental fields on farm. These four catalogue fields managed by the Station on the lands of four farmers are places for sharing knowledge: indeed guided tours are frequently organized. They are often characterized by the participation of farmers.

Therefore, the spread of varieties is produced directly, through the formal access of farmers either individually or in groups, and, in a second time, through the exchange and dissemination of seed varieties among farmers. Over the past ten years about 50 farmers have been involved in this process, of which around 40 per cent remained in contact with the Station, allowing its staff to monitor the progress of the use of landraces. There were five associations, cooperatives and companies involved, and two local authorities: the municipalities of Longi (ME) and Granmichele (CT).

The role of farmers in conserving agricultural biodiversity in wheat is essential and needs, in large part, to be rebuilt. The system implemented by farmers, researchers and processors around the activities of the Station offers, as we have seen, an example of complementarity between formal and informal systems oriented to the preservation of agricultural biodiversity. The Station, with its public role, is the pivot of the formal system, but its action would be reduced if the farmers it works with were not the pivot of the informal system for the circulation of genetic material and, above all, transfer of knowledge.

The farm Terre Frumentarie hosts one of the Station's catalogue fields. It is located in Raddusa, an area with a strong tradition of cereal production. It covers an area of over 110 ha (UAA), most of which are dedicated to the cultivation of cereals, sown each year on an area of about 55 ha. Since 2004, the company has had a test catalogue field of 5000 sqm, set up and managed by the Station of Grain Culture of Caltagirone.

The company's hallmark is the use of Sicilian varieties of durum wheat, already

classified by De Cillis, i.e. Margherito (or Bidi), white and black beard Timilia, Senatore Cappelli, Long Spelt and Mallorca soft wheat. The farm operates using organic methods. The selection of the seeds is carried out in the field first, where the best fields are selected (to perform the *ammannato* practice), before proceeding with a final selection of the seed.

The process of diversification on cereal varieties originated from the "awareness" developed by the farmer after the best response obtained by the on-site selected grains in organic farming management (rotation, green manure and fallow). The first local variety sown was Timilia: they started from 40 kg of seed, which represented the beginning of the collaboration with the Station.

The good results of the first sowing of Timilia resulted in the spread of the use of landraces to the complete abandonment of modern varieties. In five years, Terre Frumentarie introduced in the open field five landraces: Timilia, Senatore Cappelli, Mallorca, Margherito, and Long Spelt. Work on multiplying the seeds was very carefully and meticulously carried out due to the small size of the original amount of seed. This was especially true for Long Spelt and Mallorca. Different tests were performed on other varieties, but they did not produce sufficient results for the varieties to be used.
The farm has also attempted to identify suitable legumes for green manure and hay, always in collaboration with the Station. Interesting results were achieved with chickpea production but the agronomic consequences determined the abandonment of production. The land that had housed chickpeas was less generous toward the wheat, reducing its growth and yield. At the moment only the green manure bean is cultivated and extensive use of fallowing is made, even for grazing, in agreement with neighbours.

The informal system of circulation of seeds started by Terre Frumentarie could develop relatively quickly. Indeed, it is connected to the activity of the Station, therefore it could easily ensure quality control on the genetic material in circulation. In addition, the informal system could generate new demands that may reveal themselves to be valuable with regards to the research activities carried out by the Station.

Terre Frumentarie and the Station are participating in the plant participatory breeding programme of the seventh FP project SOLIBAM involving farmers and researchers (www.solibam.eu). For the time being, two segregating populations of durum and soft wheat will be cultivated on the farm.

As De Cillis pointed out in 1942 "the farmer in Sicily has a specific sensitivity towards the selection of varieties and good seeds".

Case Studies in Brief

Collective ownership of the seeds of Kaol Kozh association – France

The Kaol Kozh initiative fits into the ideas of the Seeds House (For further details of the Seeds House see thematic section B) as a case of «exchange of small quantities of seed for scientific purposes or work of selection» (Article 1-3 of Decree 81). The legal legitimacy could, however, be challenged by the fact that farmers benefit from the exchange, but also cultivate the seeds (exchanged) for "commercial" exploitation of resulting crops.

2. Increasing Genetic Enhancement and Base-Broadening Efforts

Périgord's Seed House for Organic Farming - France

Since 1990 AgroBio Périgord has been working towards the development of organic farming in the Dordogne, in southwestern France. It is a non-profit association administered by a board of directors comprising organic farmers of the Et department and supports producers in implementing environmentally–friendly agricultural practices. AgroBio Périgord is federated with the regional structure Bio d'Aquitaine, which adheres to NFOA (National Federation of Organic Agriculture).

The first experiments conducted by AgroBio Périgord in 2001 concerned the evaluation of 11 varieties of Guatemalan population maize. Subsequently, the project was oriented, throughout several meetings, toward the collection of rare varieties that had been preserved for personal use by peasants. In addition, the French Institute for Agricultural Research (NIAR) provided some varieties conserved in gene banks. Gradually, the project included more and more varieties/population of maize. Then, according to the producers' demands, the diversification of species focused on other projects: sunflower, soybean, forage, etc.

Meanwhile, a collection of skills was acquired through experience exchange during travels in farming communities, particularly in Brazil, and through meetings with plant breeding professionals. The re-appropriation of farmers' knowledge and skills in the field of seed selection and self-production became a main focus of the program.

Gradually, the project reached a regional level and in 2003 became the program «Aquitaine cultivates biodiversity», supported by regional authorities. The program now has about 90 types of population maize, ten of sunflower, as well as varieties of sorghum, soybeans, moha, lupine, etc. In 2009, these varieties were tested and grown on 31 ha and by over 200 organic and conventional farmers throughout France.

Table Two – Some Problems Associated with Industrial Agriculture

Problems	**On site effects**	**Off site effects**	**Global effects (externality)**
Climate change	Degradation of soils and rice fields (salinization, loss of organic matter, disappearance of local seeds)	Groundwater depletion Loss of local biodiversity, changes in eating habits	Increase of carbon dioxide, methane and nitrogen oxides in the atmosphere, ozone depletion in the stratosphere Decline of rainfall, drought, famine, poverty, (...)
Deforestation	- disappearance of vegetation cover, loss of ecosystems, migration of certain species, disappearance of natural curtain, phenomenon of accelerated runoff, reduced infiltration	Siltation and sedimentation of rice paddies, loss of local biodiversity, change in eating habits	Increasing greenhouse effect, loss of biodiversity, desertification, soil degradation

During an exchange trip to Brazil in 2003, the coordinators of the «Aquitaine cultivates biodiversity» program set up the idea for a Seed House. They met different communities and set up a local group of traditional seeds storage and exchange, which focuses on participatory plant breeding. These communities were often supported by a technician of an institutional agricultural structure or a cooperative.

The Seeds House objectives are to maintain and develop crop biodiversity through the dissemination and exchange of both seeds and know-how. It consists of a «Field crops» section for professionals and a «Market gardening» section for professionals and individuals. It has two main tasks: a) the provision of seed lots and b) the sharing of know-how.

The Seeds House fosters experimentation conventions by providing seed lots to farmers and private partners, so as to enable these varieties to be grown in fields and be the objects of in situ experiments. In light of the fact that seed distribution is allowed in experimental settings, the activities of the Seeds House are consequently legal. The varieties made available to professionals are selected on the basis of the production system, the farmers' objectives, and the land on which the operation will be conducted. Choosing the most suitable variety enables the farmer to preserve and let the seeds evolve over time.

The farmer or gardener gathers technical notes and information throughout the cultivation term. The producers' records and technological analysis allow publication of the experiments' results. The farmer or gardener also conducts a mass selection according to the protocols provided and returns to the Seeds House three times the amount of seeds they received. In return, the Seeds House provides technical support. The durability of the variety is ensured by the multiplication of the cultivation locations. A backup sample of each variety is also maintained in a «static way», so that the Seeds House might be able to deal with potential on-field destruction or external pollution (e.g. GMOs).

The farmers replant the varieties each year and, as the selection is made according to the farmers' objectives and needs, they make the varieties evolve from their departure point.

Today, most farmers are still evaluating the varieties and recovering technical procedures related to seeds selection and self-production. Only a few older members are actively involved in creating a real work of evolutionary selection and return seeds regularly or provide new varieties.
The technical know-how of the peasants' seed selection has generally been forgotten. To ensure the durability of the genetic heritage kept through dynamic management at the Seeds House, it is important that farmers claim such techniques back.

For this reason, the Seeds House provides technical support to each individual farmer. However, given the increasing number of participants (more than 200 producers in 2009) more and more collective training is provided. This also allows a degree of experience sharing between farmers.

The Seeds House has also developed a dialogue with public research professionals and technical specialists both in France and abroad. This connects field practice and

scientific knowledge.

Seeds House is engaged in a process of dynamic management of crop biodiversity thanks to its activities of conservation and in-situ evolutionary selection of populations. In addition, this organizational concept has the advantage of allowing the distribution and the recovery of these seeds, while not opposing binding legislation.

The seeds offered by AgroBio Périgord do not belong to the farmers; they can use them for testing but cannot sell them. The collective property of Seeds House indemnifies the work of experimentation, research, selection and / or conservation done by farmers. The seeds always stay in the hands of the same owner: the Seeds House. Agrobio Périgord's conventions were controlled by fraud services.

This way of working brings interesting agronomic results. Other on-going projects of the Seeds House are aimed at experimenting and keeping in-situ farmers' varieties, obtaining varieties adapted to the cultural patterns defined by the farmers, and enabling farmers to reclaim their selection work.

Case Studies in Brief

The case of the Agricultural Research Institute of Martonvásár – Hungary

The objective of this program was to develop premium category (high quality) organic food products from special cereal varieties for a niche market in Hungary and Europe. Organic farmers located in different regions of Hungary are contracted to multiply seeds and grow the special emmer and einkorn varieties. The breeder creates several different genotypes to be tested by farmers who in turn have the possibility to evaluate the varieties based on their agronomic and quality performance. The seeds are multiplied and the malting and brewing technology are developed by researchers.

Wheat Group of the Network of Farmers' Seed: the sharing of innovation – France

The Wheat Group of NFS shows the potential of collective action and networking. The network is seeking to eliminate boundaries and rigid hierarchies of status within collective work; the dynamic management of crop biodiversity is thought of in terms of flux and interaction rather than in terms of stocks and substances, as is too often the case with the genetic resources used as raw material from conventional breeders. This initiative carries out a comprehensive action strategy for sustainable use and dynamic evolution of wheat.

3. Promoting Sustainable Agriculture through Diversification of Crop Production and Broader Diversity in Crops

Traditional Fruit Tree Varieties - Romania

Hamba is a former Saxon village in the centre of Transylvania with approximately 300 residents. The agriculture practiced in the village is self-sufficiency farming in which farmers focus on growing enough food for their families. The main crop cultivated by the villagers is corn, 70 per cent, other major crops being potatoes and lucernes. In the area

there is a large fruit farm of nearly 300 ha, which is not locally owned, but normally the largest family farm area is around 3 ha.

Wilhelm Tartler cultivates a diverse range of fruit trees, about 50 varieties that originate in Transylvania. Among these breeds, 80 per cent are apple trees, 10 per cent are pear while the remaining 10 per cent are plums, apricots, peaches and walnuts.

Modern varieties are developed to be more productive when compared to the traditional ones, and to have thick peel so that they can better tolerate transportation. Moreover, they are put on rootstocks (M9 and M27, brought from England) specially selected for rapid apple production with a life expectancy of no more than 10 to 15 years. On the other hand, traditional varieties don't offer the same uniformity to be easily sorted and packed by machines and then transported thousands of kilometres from the production field. Instead, the traditional varieties are more robust, more resistant to local environmental conditions and their range of flavours is much more diverse - an asset extremely valuable for consumers.

In most cases, farmers maintain diversity to make sure that they meet local pedo-climatic conditions and to benefit from the knowledge inherited from their family.

The traditional fruit trees are not necessarily resistant. Rather, they are more tolerant: while they do get diseases, although the tree is affected it still produces fruit and manages to stay alive. For example, in a rainy year, the Jonathan or Golden variety have small apples, all covered with spots (Apple scab disease - *Venturia inaequalis*) while a Pătul or a Domnesc apple tree catches the disease, but still produce fruits and after a while the tree heals.

Wilhem Tartler has a nursery that produces varieties multiplied upon request. Due to the demand rate some varieties, the more popular ones, became more cultivated, thus reflecting the farm’s adaptation to the economic environment. His genuine interest in traditional varieties has made him famous in the region for his fruit trees’ nursery and his tree breeding knowledge. One of his main contributions to the community was the collaboration with the Mihai Eminescu Trust Foundation that now has a traditional apple tree orchard.

Wilhelm Tartler started to take care of fruit trees when he was working on his diploma paper in horticulture. He sent questionnaires to the authorities and people around Transylvania to ask for information regarding varieties. Afterwards he went to different villages to collect twigs. For the varieties where he could not see any fruits in advance, the twigs were grafted onto small, bushy rootstock in order to identify the variety as soon as possible. Often, people sell tree varieties as traditional, but when the tree starts to produce fruits, the farmer discovers that they are actually Jonathan or Golden Delicious. His pursuit of traditional varieties is ongoing as he still continues to go to the market and look for what farmers are selling in the hope that he will discover another old variety.

The used rootstocks are mostly selected and grown from Pădureţ varieties. One of the practices to grow new rootstock is to throw on the ground what remains after the apples have been squeezed for juice. Some of the seeds sprout and grow nice plants, which can't be allowed to develop into trees. These small trees are then used as rootstocks. The seeds in the fruits are already pollinated by all kind of unknown pollen

sources, and because of this they cannot be directly used to sprout a known fruit tree variety. This is why they have to be grafted. As a rule a less vigorous variety is grafted on a vigorous rootstock. Otherwise, if an already vigorous variety is grafted on a vigorous rootstock, even though that tree will probably live for 80 years, its first fruits will only start to appear after more then ten years.

The trees that provide the twigs for grafting are near his house. Nevertheless, Wilhelm Tartler created two reserve stocks - one in Avrig in the Bruckental Park and one at the Mihai Eminescu Trust's orchard.

When selling, he gives young trees, two or three years old, to the buyer. He collaborates with a German fruit tree association and sometimes they exchange varieties. Unfortunately the gene banks in Romania don't manifest any interest in his work at the moment.

Apart from difficulties derived from the preference of big farms for fruit trees that go into production quickly and a market demand for varieties with thick peel, one other major difficulty is caused by the lack of knowledge among the public. People are planting all kind of fruit trees, but most of the time they do not know what they are actually planting.

The relationship with the public authorities is very precarious. On paper, Cluj County should have 150 varieties in their collection. Nevertheless, the administrators of the collections never gave Tartler access to see them.

Wilhem Tartler promotes the wider use of traditional breeds as a personal example, not having any institutional support for his work.

Case Studies in Brief

Sustainable village program in Mikóháza based on local varieties – Hungary

The programme’s main objective is to introduce a sustainable, autonomous, self-sufficient, mosaic like agricultural model in the Hegyköz region, constituting a feasible alternative to intensive agriculture. Self-sufficiency, agro-environmental farming practices and agricultural biodiversity play a key role in this model through the production of local fruit and vegetable varieties and the introduction of animal breeds of poultry, cattle and sheep native to the Hegyköz region.

The long-term experience of the Valli Unite Cooperative – Italy

The Valli Unite Cooperative is, as one of its founders, says, “almost a community”. Initiatives arose from an informal approach, in which Valli Unite and its members continuously acquire and disseminate expertise and skills. Given the experience of over thirty years, it would be impossible to trace the amount of genetic material used, improved, discarded or lost. Valli Unite carried on several specific programs of recovery and dynamic conservation of local varieties and breeds.

Languedoc-Roussillon inventory of collective movement to date – France

Languedoc-Roussillon is an agricultural region full of contrasts and has a wide range of agrosystems. Unlike neighbouring regions, Languedoc-Roussillon has not yet developed a program to support activities for crop biodiversity. Nonetheless, a variety of complementary actors are working on various initiatives. Networking and coordination between these initiatives are necessary in order to strengthen and encourage such process in order to protect and support crop biodiversity within farms.

The case of Biokultúra Association of Organic Farmers – Hungary

Several regional associations of the National Biokultúra Association of Organic Farmers have started to organise for reintroducing and testing seeds of local vegetable varieties. Their main motivation is to find and use seeds that are adapted both to organic farming and to soil and climate conditions characteristic of Hungary.

The case of the Fruitculture Network – Hungary

The Hungarian Fruitculture Network was created about fifteen years ago on ecological philosophy of "adaptive fruitculture or pomology". The network's main activities range from the organisation of trainings, study trips and voluntary collective work on orchard maintenance known as "*kaláka*" to discussions on an online discussion list.

4. Promoting Development and Commercialization of all varieties, primarily farmers' varieties/landraces and under-utilized Species

Avena strigosa *and* Secale cereale *as Mixed Corn in High Nature Value Crofting Agriculture on the Outer Hebrides - Scotland*

The survival of *A. strigosa* on the Outer Hebrides should be seen against a background of privatization of plant breeding in Great Britain and the cessation of research associated with breeding programs at the former Welsh Plant Breeding Station (WPBS). Breeding programs were done from an ecological perspective, to develop varieties suitable for different soil fertility levels. The over 300 accessions formed the basis for plant breeding work resulting in an intraspecific classification. Special farmers' seed growers 'associations were formed in association with the WPBS to guarantee sufficient seed supply. Demand from Scotland was reportedly high from the start.

In the 1950s WSPB cultivars were widely grown on the Outer Hebrides (Darling 1955). Later breeding trials conducted at the Scottish Plant Breeding Station on *A. strigosa* ceased in the 1970s (Wright *et al* 2002) and *A. strigosa* seed disappeared altogether from Scottish seed companies. The Hebridean native *Coirce beag*, Gaelic for small oat (*Avena strigosa*) again became the prevailing type.

Avena strigosa is a diploid annual oat species. The Iberian peninsula is considered as its area of origin and it was once widely grown on the poorest soils in several countries ranging from Russia to Germany and Ireland. The Outer Hebrides likely forms one of the largest areas within Europe with autochthonous *A. strigosa* landraces. It is mostly grown in a mixture with a rye landrace.

The Outer Hebrides form a chain of 119 officially named islands stretching over 200 km northwest off the Scottish mainland. Climate is characterized by high levels of precipitation in the form of rain, often heavy and prolonged.

The largest area of *A. strigosa* landraces is here, on the islands of North Uist, Benbecula and South Uist. These islands are low lying, only few meters above sea level, along the Atlantic west coast. The growing season is short, from April to September. Summer days can have up to sixteen hours of daylight. Although frost days are less than 40 per year on average, frost can occur all year round. (Source: www.metoffice.gov.uk)

The fields are situated on the coastal flat grasslands, adjacent to the dunes of the Atlantic coasts of the islands. These grasslands are named *machair*.

The machair soils are calcaric sandy regosols or calcaric sandy gleys with high shell content and low organic matter, low in nitrogen and phosphorus and micronutrients. They are highly exposed to winds, free draining and prone to droughts. The high alkaline conditions with high Ph cause minor nutrient element Manganese deficiencies in crops and Copper deficiencies in cattle. Low-input pastoralism is the main agricultural activity. Field crops are grown for winter feed. Official statistics give 240 hectares for oats or mixed grain.

The main motivations mentioned by crofters for growing landraces are their reliability in comparison with grasses, and their volume. The most frequently mentioned reasons for growing small oat are its ability to withstand the soil nutrient deficiencies and its volume. Rye and bere were mixed in to bulk up and the rye as guarantee for yields in dry years.

The vast majority of crofters use local seed and the majority of townships still produce their own seed. An estimated 10 per cent of the cropped land is reserved for seed production. Seed production is very much dependent on the combination of availability of machinery (combines or reaper-binders), a period of dry and calm weather, and availability of labour.

Local seed production of landraces has seen bottlenecks in recent years due to seed losses through storms and heavy rain. Local seed production has its own demography and has seen a decrease in the number of seed growers in recent years, due to a combination of ageing crofters, and a lack of machinery and labour at harvest time. Seed sourcing occurs through an informal network of seed growers across the islands. Crofters who provide seed to others thus perform a community service.

A special characteristic of Hebridean cereal cultivation landraces is the use of species mixtures. This practice was known in medieval times. Species mixtures form a buffer against very risky, unpredictable environments. The strategy of yield stability through mixtures is considered (another) defining element of landraces and can be seen as an important part of a sustainability strategy by crofters. The many seed sources guarantee the maintenance of genetic diversity. This genetic diversity will form a certain buffer against the climate changes observable on the Outer Hebrides in wetter summers.

A rich wildlife is supported by this unique agricultural system of small scale cropping of mixtures of three cereal landraces on the coastal grasslands called machair

with extensive pastoralism. It meets the High Nature Value farming criteria as formulated by the European Environment Agency in 2004. Machair is listed as a habitat type in the EC Habitats Directive and a Priority Habitat in Scotland with a Habitat Action Plan. Seventy per cent of arable fields have conservation designations under the EC Habitat or Bird Directives or as National Nature Reserves. Management to secure nature conservation interests is achieved through agro-environmental schemes and various management agreements with statutory or NGOs conservation agencies.

Several local biodiviersity projects are engaged with the development of policy and legal measures to sustain use of plant genetic resources (ITPGRFA Art 6.1). Explicitly addressing the urgent issue of the demographic sustainability of crofting is the educational project *Crofting Connections* (2009 – 2011). Conducted throughout the Highlands and Islands by SCF and the Soil Association, the project offers crofting-based activities to young people aged 5-16 living in remote rural communities. Specifically addressing agrobiodiversity and the sustainability of plant genetic resources is the project theme of *Living Genebank* in which 25 schools participated in 2010, growing three cereal landraces, small oat, bere and Murkle oat.

Another example of good practice in research is a PhD research project, based at the Scottish Agricultural College (SAC) in Edinburgh, into the diversity of the Scottish *A. strigosa* genepool. This research project linked in the community secondary school Lionacleit on the Outer Hebrides, which runs a course in crofting for secondary school students.

The students, aged 13–15, were taught about *ex situ* conservation and about landraces and were involved in preparing and laying out the plots, preparing the seedbed, sowing, weeding and fencing (as protection against rabbits), harvesting and threshing.

By studying local adaptation and genetic diversity of Scottish *A. strigosa* local varieties, the Scottish genepool was documented. The trial contained an element of variety testing, including new oat varieties. The trial aimed at enlarging the options for crofters and increasing their genetic diversity portfolio, in line with ITPGRFA article 6d: broadening the genetic base of crops and increasing the range of diversity available to farmers. Although not explicitly designed to be participatory, crofters visited the open days and gave their evaluation. Some of them have started experimenting with the new varieties.

The research project, which started as an individual-academic project of conventional plant genetic resources diversity characterization, turned into a community-integrated event with educational and outreach elements, reaching out to young and old, to men (crofters) as well as women (in a baking workshop). It could be argued that this form of interactive characterization falls under the research proposed in the ITPGRFA under article 6b: research which 'enhances and conserves biological diversity by maximizing intra-and interspecific variation for the benefit of farmers, especially those who generate and use their own varieties …'

Landrace Crops in the Homokhátság Region - Hungary

In 2001 the Bács-Kiskun Agricultural Chamber of Commerce launched a programme aimed at improving the adaptation capabilities of agriculture in the

Homokhátság region, which faces severe drought, decreasing water levels in local wells and low quality sandy soil.

The programme was built on a complex partnership (altogether 26 organisations) of local farmers, research institutes, entrepreneurs, agricultural chambers of commerce, regional development agencies, ministry officials, media and civil society organisations, coordinated and facilitated by the Bács-Kiskun Chamber of Commerce. Each organisation contributed to the project in a specific way. Fulfilling the role of an intermediary, the Bács-Kiskun Chamber of Commerce organised trainings on diverse topics such as production technologies for plants, marketing and processing local products, and rural tourism. It also conducted preliminary market surveys for the alternative plants, carried out fundraising for the programme, and thoroughly documented the project's results. The Research Centre for Agrobiodiversity in Tápiószele, the country's main gene bank of field crops and vegetables, and the Crop Research and Development Institute in Szeged proposed to farmers a list of drought-resistant plants to be considered. The crops proposed included hawthorn, elderflower, amaranth, millet, chickpea, sweet anise, oil radish and hairy vetch. Based on this list the farmers had the opportunity to select the crops they preferred, and received the seeds from the gene banks. The selected plants required low inputs and yielded higher income than conventional plants, while also proving to be drought-resistant. The Bács-Kiskun County Agricultural Chamber of Commerce signed an official contract with farmers, which made it compulsory for them to supply agro-meteorological data (the amount of rainfall and sunny hours, wind directions etc.) regularly and provide opportunities for other farmers and persons interested in the programme to visit their farm. In return, farmers received a subsidy for cultivating the selected plants. The area covered by the programme in 2004 was 300 ha and involved around 300 farmers. Each year about 140 participants attended the trainings. The programme received great media attention and the results were widely spread.

Funding for the programme originated from various schemes of the Ministry of Rural Development and the South-Great-Plain Regional Development Agency. Access to long-term funding was insecure, with the extension of grants often being announced on a yearly basis.

As a positive "side effect" of the programme, the on-farm experiments with drought-resistant crops contributed to increasing agricultural incomes in the region. Moreover, civil society organisations were established in the field of rural tourism, small-scale woolly pigs called mangalitsa and grey cattle meat processing factories were launched as a result of trainings. These new initiatives increased awareness of the importance of and opportunities for local economic development.

Case Studies in Brief

Shetland cabbage: Scotland's oldest vegetable – Scotland

Shetland crofters are maintaining a surprisingly high agrobiodiversity, with higher numbers of rare breeds and native varieties than in other parts of the UK. Shetland Cabbage is one of these and likely the oldest cultivated vegetable around.

Local varieties, the heritage of traditional households – Romania

Melania and Nicolae Banc grow diverse traditional varieties that range from vegetables to cereals and corn. The varieties grown were selected over many years. Melania and Nicolae Banc continue the tradition to select and preserve their seeds from one year to another and try to disseminate their knowledge and exchange landrace seeds.

The Mosna Corn Variety – Romania

The Schuster family grow a local variety of corn that has been cultivated in Mosna for more than 150 years. It is very well adapted to local environmental conditions and its flour is very good for polenta. Through careful selection, they started to distribute the variety to friends. The feedback was very good as farmers enjoyed the result. One important aspect that weakens corn variety preservation is the aggressiveness with which multinationals advertise hybrids through media and local representatives.

The case of the Alliance for the Living Tisza (SZÖVET) – Hungary

SZÖVET promotes agricultural biodiversity in two specific ways. First, as of 2009, it is organizing yearly sapling fairs, including saplings of old, local fruit tree varieties. In a movement of solidarity SZÖVET began organising "sour cherry saving actions" on farmers' markets in Budapest to help farmers excluded from supermarkets find alternative outlets for their produce. Encouraged by the action's success, the alliance is now organising weekly fairs at several farmers' markets in Budapest offering a wider product range.

Bere, working on the valorization of prehistoric Scottish barley – Scotland

Bere or *Bigg* are the names for a six-rowed barley. It was grown historically on higher land of poor fertility in the Highlands and Islands. Within the framework of the Crofting Resources Programme of the SCF (2009 – 2013), funded by SRDP (Food Processing, Marketing and Co-operation Grant), Highlands and Islands Enterprise and the Esmee Fairbairn Foundation, work on bere has been taken up, starting with raising awareness about the plight of the landrace; exploring new markets for bere products; getting commercial bakers interested in the bere bannock.

Agricomplex Ltd. A rural development and employment model: special quality vegetables for food production – Hungary

This is a private initiative for the production of high quality vegetables through the participation of students and unemployed people for consumption or for local public catering programmes. The varieties are collected, including seeds from nearby home gardens or research institutes. They are tested scientifically and are being prepared for official registration.

II. 5. Supporting Seed Production and Distribution

Cooperativa La Verde - Spain

La Verde cooperative is a group of six people that started this organic farming

project 25 years ago. It is considered one of the pioneers of organic farming in Spain and emerged from casual labourer movement during the 1980s. It is located in Villamartín, province of Cádiz.

La Verde's main activity is selling horticultural crops and fruits. Commercialization is carried out through Pueblos Blancos, a cooperative that connects a group of ecological farmers in Sierra de Cádiz, by distribution to small shops specializing in organic products, associations and groups of consumers, and school canteens, mainly in Western Andalucía. It also has an 'ecobox' scheme. The commercial objective is to be as close as possible to the consumer and that is why they have a large range of crops and varieties throughout the year.

However, it is a cooperative where many other activities are also carried out, such as courses, open doors days, on farm practical training agreements, local varieties, tastings, etc. In La Verde, know-how comes from a mixture of practice and theory. It comprises a total of 14 ha. A privileged location next to the river gives them plenty of water and they have a powerful pumping system for sprinkler and drip irrigation.

The farm is almost flat and the soil is very variable. Its fertility has improved over the 25 years of ecological management. The cooperative has its own plant nursery and also sometimes buys ecological plants when it is not possible to self-produce them: it produces 70 per cent of its own vegetables. Generally, the farm does not tend to have pests and diseases due to the ecosystem balance that has been achieved there. Three irrigation systems (sprinkler, drip and gravity) are combined, depending on plants' needs and plant health.

Weed management is one of the most critical aspects, because many farmers think that *"La Verde is full of weeds"*. Management is based on the Critical Periods of Competition idea and during last stages of crops, weed development is quite big. This strategy allows the cooperative to save lots of manpower while obtaining satisfactory results in a key aspect in organic farming.

La Verde itself is a unique ecosystem in the area and the biodiversity management of cultivated species is therefore exemplary. In terms of its biodiversity of species and crop varieties, La Verde often grows, between winter and summer, more than 30 species of vegetables and 128 traditional varieties, plus more than ten species of fruit trees (trees and shrubs). In the spatial and temporal biodiversity the farm maintains a complex rotation of species and fallows and uses numerous crop associations.

In the cooperative's seed bank there are around 660 traditional varieties. There are not computer records for these varieties and listing all of them would be a project in itself. In the following table (Table three), species and different 'types' are shown, as well as how many varieties of each species are normally grown and the total amount in the seed bank. Among fruit trees, the cooperative has some local varieties of figs, plums, apricot from Bornos, apples (perillos de Ronda, perillo de Zahara), pears(Capa rey), albérchigo[14], pomegranates and quince.

[14] They are red peaches, more rustic and smaller than yellow peaches and with an intense flavour.

Varieties have multiple origins, from local traditional varieties from Villamartín to worldwide, although most are from the province of Cadiz and from Andalucía. Some seeds come from public conservation seed banks, such as the Centro de Recursos Fitogenéticos (Plant Genetic Resources Center) in Madrid, the Banco de Germoplasma Vegetal Andaluz (Andalusian Seed Bank) in Córdoba and the Centro de Conservación y Mejora de la Agrodiversidad *Valenciana (*Center for Conservation and Improvement of Agro-biodiversity) *in Valencia.*

La Verde usually spends between 0.5 and one ha for seed production and there is usually a partner in charge, to avoid problems such as loss of a variety. *The main reason* for doing this is "to be independent, and not be dependent on seed multinationals*"*. La Verde also argues that adaptation of local varieties is better for the local climate and growing conditions.

In the case of cross-pollinated species and to prevent varietal degeneration, the cooperative exchanges seeds with other people or agrees with producers in other areas to multiply seeds. Work on species that require cold for seed production (e.g. sugar beet) is coordinated with cooler areas such as Sierra Nevada in Granada.

When selecting plants that will produce fruits for seed the farmers screen for health and those that fit the expected characteristics for the variety. *Often plants from which seeds were to be obtained were* marked, but now the farmers include more plants and do not focus only on a few. However, the large number of varieties complicates the selection of better fruits/plants so they select them after harvesting.

La Verde sells seeds and seedlings of local varieties and insists that it is a complement to the farm economy. Usually people get in touch with the cooperative by phone and seeds are sent by post. Some people visit the farm to buy seed and seedlings. Prepared seeds packets are also sold in organic product stores.

One of the more interesting activities is local varieties' tastings in collaboration with other entities, such as councils. The main objective is to raise awareness of local varieties both with consumers and with other producers. Locally, La Verde has good relationships with Grupo Desarrollo Rural "Sierra de Cádiz", Mancomunidad de Municipios de la Sierra de Cádiz y Diputación de Cádiz, as well as with CIFA de Chipiona. It is also in contact with el Centro de Recursos Fitogenéticos del INIA (Madrid) and COMAV (Centro de Conservación y Mejora de la Agrodiversidad Valenciana, Valencia). La Verde has been cooperating closely with Instituto de Sociología y Estudios Campesinos (ISEC) de la Universidad de Córdoba and keeps contact with Universidad Politécnica de Valencia and other European universities.

La Verde has cooperated in numerous research projects with universities and other entities, in organic farming and traditional varieties. Usually, it works with Centro de Investigación y Formación Agraria (CIFA, Agricultural Research and Training Center) from Chipiona (Cádiz)

For the last four years La Verde has been part of the Universidad Rural Paulo Freire "Sierra de Cádiz" and has conducted several workshops on agriculture. It is also involved in projects on drug dependency, and works with federations of mentally ill people and in other cultural activities. La Verde is member of Red Andaluza de Semillas

and a partner has been the president of the association for several years.

Table Three – Species and number of traditional varieties in La Verde

Specie	Type	Used	Total	Specie	Used	Total
Tomato	Indeterminate	3	120-130	**Bean (ind.)**	2	40-50
	Mini	11		**Bean (det.)**	2	
	Determinate	9		**Pea**	3	4-5
Pepper	Frying	1	20-25	**Faba bean**	2	3-4
	Oven	3		**Chickpea**		6-7
	Small	4		**Lentil**		2-3
Eggplant		4	18-20	**Chard**	1	2
Corn		5	200	**Spinach**	1	2
Muskmelon		8	70-80	**Onion**	5	5
Watermelon		6	20-30	**Leek**	2	3-5
Pumpkin		8	15-18	**Celery**	2	2
Squash		4	4	**Fennel**	1	2
Cucumber		1	4	**Parsley**	1	2
Radish		3	4-5	**Carrot**	3	3
Rocket		1	2	**Cabbage family**	1	40
Turnip		1	2	**Sunflower**	2	6-7
Lettuce		8	20-25	**Mustard**		1-2
Escarole		2	3	**Basil**	2	3
Thistle		1	1	**Marigold**	1	1
Cilantro		1	2-3	**Tobacco**		3-4

Case Studies in Brief

Alonso Navarro – Spain

Alonso's farm has become a reference point for local farmers that look for locally adapted seeds. The main principle adopted on the farm is attention to the adaptation of plants to local soils and way of farming. Alonso doesn't know exactly how many varieties he has but the number is around 300 in more than 30 species. Organic, biodynamic and small farmers in general find seeds that are not available on the conventional market; seeds that, more and more, answer to consumer demand.

Experience and knowledge exchange on self-reproduction of seeds; selection and recovery of a variety of radicchio and diversification of farm production – Italy

The purpose of the "Itinerant Experiential School of Organic Farming" is to overthrow the traditional paradigm of school education, promoting instead the transmission of practice-focussed knowledge. It is not only a physical location, represented by the companies themselves, it is also a teaching method based on concrete experience. Self-reproduction and back up storage of seeds are the main activities. The selection needed for seed reproduction occurs within a network of companies, especially for radicchio seeds.

The Aries Water Onion Variety – Romania

The case is illustrative for the whole community on the Aries Valley that cultivates onion. The seed management system does not include any seed selling, formal or informal, as the seeds are basically a family legacy. The knowledge transfer is directed to the members of the family, technicians or other agricultural professionals playing no part in this process.

References

Blangiforti S., 2010, *Pane, frumento e tradizione*, Operaincerta n 59 del 14 giugno 2010. Available on-line at: http://www.operaincerta.it/archivio/059/archindex.html.

Bocci R., Chiari T. (eds.), 2009, *Report on Case Studies on Article 6 of the International Treaty on Plant Genetic Resources For Food And Agriculture*, IAO.

Crofting Commission, 2012, 'About Crofting' on the *Crofting Commission* website. Available on-line at: http://www.crofting.scotland.gov.uk/What-is-Crofting.asp

Csaki C. and Kray H., 2005, Romanian Food and Agriculture from a European Perspective, ECCSD Environmentally and Socially Sustainable Development Working Paper no 39.

Darling, F. Fraser (ed.), 1955, *West Highland Survey. An Essay in Human Ecology*. Oxford University Press.

De Cillis U., 1942, (reprint) 2004, *I Frumenti Siciliani. Patrimonio da mantenere e valorizzare*, Maimone, Catania.

EC, 2010, *Options for an EU vision and target for biodiversity beyond 2010,* European Commission. Available on-line at: http://ec.europa.eu/environment/nature/biodiversity/policy/index_en.htm

EC, 2012a, *EU Biodiversity Strategy to 2020 – towards implementation*. On-line information from the European Commission Directorate-General for the Environment. Available on-line at: http://ec.europa.eu/environment/nature/biodiversity/comm2006/2020.htm

EC, 2012b, *Seeds and propagation material. Review of EU Rules*. On-line information from the European Commission Directorate-General for Health and Consumers Available on-line at: http://ec.europa.eu/food/plant/propagation/evaluation/index_en.htm

EU, 2008, *Rural Development in the European Union. Statistical and Economic Information, Report*, European Commission Directorate-General for Agriculture and Rural Development.

Ibanescu, M., Strajeru, S. and Constantinovici, D., 2002, 'Conservarea in situ a biodiversităţii agricole (In situ conservation of agro–biodiversity)' *Sănătatea plantelor* 10, 2.

Lang T., Barling D., Caraher M., 2009, *Food Policy. Integrating Health, Environment and Society*, Oxford University Press.

Lockie S. and Carpenter D., 2010, *Agriculture, biodiversity and markets*, Earthscan, London.

Luca, L. et al., 2009; *O tara si doua agriculturi. Romania si Reforma Politicii Agricole a*

UE (One country and two agricultures. Romania and the Reform of the Common Agricultural Policy of the EU), Centrul Roman de Politici Europene.

Maxim, A. et al., 2010, *Biodiversitate si bioconservare (Biodiversity and bioconservation)*.

Ministerul Agriculturii si Dezvoltarii Rurale, 2010, *Programul National de Dezoltare Rurala 2007-2013*, updated version.

Nomisma, 2008, XI *Rapporto Nomisma sull'agricoltura italiana*, Nomisma, Roma.

Platform for Agrobiodiversity Research, 2010, *Biodiversity for Food and Agriculture*, FAO.

Proiect UNDP-GEF de asistenta pentru Guvernul Romaniei, 2010, *Strategia nationala pentru biodiversitate si planul de actiune*, „Suport pentru alinierea Strategiei Nationale si a Planului de Actiune ale Romaniei, cu obligatiile Conventiei pentru Biodiversitate si a dezvoltarii managementului de informare" (National Plan for Biodiversity).

Strajeru S., Ibanescu M, Costantinovici D., 2009, 'Landrace Inventory for Romania', in Di Detelainen M., Negri V., Maxted N. (eds), *European Landraces: On-farm Conservation, Management and Use*, Bioversity International.

UN FAO, 2009a, *International Treaty on Plant Genetic Resources for Food and Agriculture,* United Nations Food and Agriculture Organisation. Available on-line at: ftp://ftp.fao.org/docrep/fao/011/i0510e/i0510e.pdf For further details of the treaty see: www.planttreaty.org

UN FAO, 2009b, 'Compilation of Submissions Sent by Contracting Parties, Other Governments, and Relevant Institutions and Organizations on the Implementation of Article 6', *Third Session of the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture* (Tunis, Tunisia 1-5 June 2009), United Nations Food and Agriculture Organisation. Available on-line at: ftp://ftp.fao.org/ag/agp/planttreaty/gb3/gb3i05e.pdf

UN FAO, 2011, 'Implementation of Article 9, Farmers' Rights', *Fourth Session of the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture* (Bali, Indonesia, 14-18 March 2011), United Nations Food and Agriculture Organisation. Available on-line at: www.informea.org/uploads/decisions/plant-treaty/_4232_R6_2011_en_4eae9e2460e10.pdf

Van der Ploeg J.D., 2008, *The new peasantries – struggles for autonomy and sustainability in an era of empire and globalization*, Earthscan Publications.

Wright, IA, Dalziel, A.J.I, Ellis, R.P, Hall, S.J.G, 2002, *The status of Scottish rare breeds and plant varieties*. Macauley Institute and SCRI.