**Preparatory action on EU plant and animal genetic resources**

# AEGILOPS – The Greek Network for Biodiversity and Ecology in Agriculture

## Overview

### 1. Objectives

The Greek Network for Biodiversity and Ecology in Agriculture named AEGILOPS (after a wild wheat progenitor) has evolved from the original Network for the Preservation and Exchange of Local Plant Varieties and Indigenous Breeds of Animals of the Workshop of Ecological Practice, an NGO for ecological farming, which was based and active in Thessaloniki from 1991 to 2000.

AEGILOPS is a network for Biodiversity and Ecology in Agriculture which tries to build on various pillars (seed collection, organic breeding and seed schools) to maintain and develop local varieties as well as strengthen the role of organic farmers in the conservation of genetic resources. It was founded in 2004 in Volos, Central Greece, focusing on the preservation – re-cultivation of local varieties / heritage crops and the development of varieties and seeds adapted to local conditions and organic farming. AEGILOPS has adopted participatory processes with farmers and other stakeholders in the food chain for the evaluation and the selection of these local varieties (mainly cereals and vegetables) to produce healthy and quality products.

The case study aims at further understanding the activities of the network mainly based on voluntary participation from local farmers and collecting information as regards the advantages of such network for the conservation of PGR, as well as difficulties in maintaining/developing the network and implementing conservation activities.

### 2. Description of the case

Greece has a long history as regard the conservation and sustainable use of plant genetic resources and is a country rich in PGR. The interest in PGR started in the early 1920's, where newly established major crop breeding institutes (Cereal Institute, Cotton Institute, Institute of Fodder Crops, etc.) started to collect germplasm. These collected genetic resources have been widely used in national breeding programmes, particularly during the period 1925-1970, when the first Modern Greek varieties were produced in almost all major crops through selection from local landraces or by crossing these landraces with introduced

varieties from abroad. This approach led to the development of a series of modern cultivars as early as 1957 and shortly afterwards to surpluses and exports.

At this stage, Greece was one of the leading countries in the EU regarding the conservation and use of GR for the development of modern varieties and improved cultivars. However, the early germplasm collections were soon lost for various reasons, the main one being World War II and the Civil War which affected the appropriate conditions for safe long-term seed storage and the priorities of the new industrial agricultural model in Greece after the war which led to the domination of new modern varieties and hybrids.

This led to the establishment, in 1981, of the Greek Gene Bank (GGB) by the Ministry of Agriculture at the Agricultural Research Centre of Macedonia and Thraki under the support of the FAO. Another important step was the establishment of the National System for Plant Genetic Resources in 1990 (Presidential Decree No 80/1990). The Greek Gene Bank of the National Agricultural Research Foundation (NAGREF) serves as the coordinating scientific and implementing body for this project, supported by all the major crop breeding institutes of the country, which also belong to NAGREF. Other conservation and research bodies, such as universities, technological education institutions, botanical gardens, natural history and agricultural museums, as well as non-governmental environmental protection groups and heritage seed networks could be linked through this framework.

The number of germplasm accessions of the GGB was raised from 7,220 in 1995 (belonging to 66 genera and 169 species of crop plants and relatives) to 10,650 in 2005 through a series of collecting expeditions within the country. A significant part of the accessions (wheat, barley, maize, rice, oats, cabbages, sugar beet, carrot, onion, eggplant, grapevine, minor vegetables and fruits), maintained in the Greek Gene Bank or in the gene banks of certain crop breeding institutes of NAGREF (i.e. Cereal Institute, Agricultural Research Centre of Macedonia and Thraki, Grapevine Institute), were regenerated, characterised and evaluated for a number of important agronomic properties through a number of EU co-funded Programmes such as those of the Regulation 1467/94/EC, other EU initiatives and national funding initiatives.

In that overall context, the involvement of NGOs is important. Some are directly interested in the protection and use of the traditional Greek landraces. For example, PELITI maintains a network of predominantly but not exclusively ecologically oriented farmers who are interested in protecting and conserving traditional Greek landraces through on-farm cultivation. PELITI now holds the biggest local seed exchange network in Greece, followed by other local networks and community seed banks. It organises an annual seed exchange festival, gathering a large number of seed savers and gardeners, with the participation of seed activists from abroad. Then there is ARCHIPELAGO, an environmental NGO with an extended seed bank of varieties of islands of the Aegean.

Finally, AEGILOPS is another NGO that is well recognised at Greek and EU levels. AEGILOPS's network conserves and grows farmer landraces. Wheat is the main part of

seed collection with over 200 Greek varieties and populations which mainly come from the Greek Gene Bank, other seed banks and farmers. The collection also includes other cereals like barley and corn, pulses, vegetable varieties and also local fruit.

AEGILOPS's members are primarily ecological farmers but the organisation wishes to build cooperation with individuals, groups of scientists, educators and all those who strive to achieve its mission. It also cooperates with other similar entities in Greece and abroad.

The main objectives of the network are as follows:

1. To conserve heritage varieties and traditional agricultural knowledge and to restore landraces into contemporary agricultural practice in ways that benefit the community;

2. To develop plant varieties adapted to local organic production which use the benefits of locally adapted genetic resources for ecological agriculture; and

3. To strengthen the role of the farmers in the conservation of genetic resources as well as protect their rights in taking part in the management and benefits of agrobiodiversity.

The priority to farmers, as members of the network, stems from the conclusion that conservation, preservation and sustainability are directly related to appropriate use. The key to the effectiveness of AEGILOPS's activity is the re-introduction of varieties (and breeds) to have as appropriate and vital tools for contemporary and future farming.

AEGILOPS works in close collaboration with the Greek Gene Bank and universities to evaluate and select landraces which can thrive in variable organic environments. To date, the priority given to participatory breeding and the restoration of landraces and traditional crops, resulted from the fact that for these areas of concentration, credible and knowledgeable partners joined AEGILOPS's work. Such partners were the National (Greek) Agricultural Research Foundation and especially its Gene Bank, the Aristotelian University and the University of Thessaly, national and regional agricultural ecological movements and groups, private agriculturalists and agricultural consultants, local authorities and private farms.

AEGILOPS's main current activities and projects read as follows:

- Restoration of local varieties: Wheat is the main part of the seed collection which also includes other cereals, pulses, vegetables and fruit varieties;
- Organic breeding: Research in the field has already revealed that Greek heritage varieties showed good agronomic adaptation under organic farming. In times of economic crisis organic farmers can ensure their income by taking part in the breeding process and by producing unique products for the market. In addition, on-farm conservation and selection enables landraces to evolve and play an important role in dealing with problems like climate change. A number of bread and hard wheat

varieties have been evaluated, selected and regenerated to be reintroduced to organic farming, under participatory procedures since 2004. Recently, there has been an ongoing long-term research programme to select these varieties.

Many young organic farmers seek old varieties but they lack knowledge on where to find seeds, as well as which varieties to select and to reproduce. Therefore, most of them buy imported seed of varieties that are not really suitable for the farming conditions of Greece. Additionally there is no evidence for the adaptability of traditional crops such as sesame to organic agriculture, though there is traditional knowledge on how to grow these crops without many inputs. This knowledge should be documented and also passed on to organic farmers along with the seeds. AEGILOPS's Heritage Wheat Programme, during the last 4 years, has been evaluating and selecting landraces of various ancestral wheat material, including emmer, einkorn, and spelt for organic breeding purposes which can thrive in various organic environments. This on-farm conservation procedure allows landraces to evolve and adjust to climate change, which is very important for the food security of the region and the world.

- "Seeds of liberty": This initiative aims at strengthening the local seed supply systems to ensure seed security and food self-sufficiency at community level. Efforts are aiming to establish seed conservancies and nurseries organised by and accessible to peasants in various regions of the country;
- Seed schools: Enhancing farmers' ability and capacity to use and manage agrobiodiversity through training and the exchange of experience;
- Awareness campaigns: The recent economic crisis and climate change revealed the vital role of agrobiodiversity for sovereignty and food security for the world. AEGILOPS takes part in community actions undertaken by farmers and consumers in Greece and worldwide.

These participatory breeding programmes are supported by "Regional Focal Points" which usually are private farms. Focal Points have been set up in Athens, Thessaloniki, Patra, Kastoria, Lesvos Island, Kefalonia Island and are being coordinated by AEGILOPS's Focal Point Office in Volos. Most Focal Point coordinators are agronomists.

Through this organisation, AEGILOPS has collected, tested in field trials and selected various landrace cereals, vegetables, fruit trees, herbs and ornamental plants to be given to organic farmers/members for cultivation.

## Analysis

### 3. Funding and support

Funding is limited for the network. It comes mainly from in kind support from each of the farms which are associated to the network. Funding mainly comes from membership fees and donations (50 active members and 200 supporters). There is no staff and coordination is performed by a limited number of people on a voluntary basis. This situation leads to difficulties in implementing all actions and projects the network would like to carry out.

Although AEGILOPS is a well-known and experienced organisation in Greece, it has been facing financial issues, putting at risk their operational ability related to the recent economic crisis.

### 4. Positioning at local or regional level, partnerships and networking

As mentioned above, AEGILOPS's members are primarily ecological farmers but the organisation cooperates with other similar entities in Greece and abroad. Such partners were the National (Greek) Agricultural Research Foundation and especially its Gene Bank, the Aristotelian University and the University of Thessaly.

At international level, AEGILOPS is a member of European agro biodiversity networks (Lets Liberate Diversity, SAVE) and a member of the Greek Movement against GMOs.

Additionally, AEGILOPS dedicates significant effort to develop contacts with national and regional agricultural ecological movements and groups, local governments and private farms.

All this information further highlights that AEGILOPS's active involvement in PGR issues.

### 5. Communication

In 2012, AEGILOPS initiated the coordination of Seed School and since then, every year, has been coordinating training courses for farmers, processors, consumers and seed savers in many regions of the country. The target participant group consisted of seed group operators and experienced farmers who took a high level training and skills for successful seed management. AEGILOPS considered Seed School as a bridge between the seed movement and the academic or scientific sector. Ultimately, Seed Schools aim at improving farmers' capacity to use and manage agrobiodiversity at farm level by training and exchanging good practices between farmers.

AEGILOPS was for some years an NGO representative in a consultative group for Plant Genetic Resources, coordinated by the Ministry of Agriculture. Several proposals and recommendations were made since then under the ongoing review and implementation procedures of the EU legislation, to guarantee farmer's rights particularly related to farmer's seeds and the free use of biodiversity.

As regards communication with the gene banks in Greece, there has been at least a 10 year old close cooperation history between Greek Gene Bank and NGOs like AEGILOPS. Seed samples were given for cultivation and regeneration to organic farmers. Regenerated seeds and also landraces collected and preserved by farmers were given back to the Bank. Despite its willingness for collaboration, GGB was often unable to satisfy many requests for germplasm, since there are few maintained seeds, and funding as well as expertise shortages were not allowing massive regeneration under scientifically acceptable standards to produce sufficient seed quantities for both conservation and distribution. Therefore, the Gene Bank seemed to understand the real interest and concern of farmers, environmentalists, ecologists and the general public, for the protection and conservation of traditional varieties – finding in them the most important partners - and NGOs also seem to understand the weakness and the general reluctance of the system to «invest» in plant genetic resources.

## 6. Sustainability

The main legal obstacles have to do with farm saved seeds and the commercial use of landraces. Organic farmers are now obliged to use organic seeds from registered (uniform) varieties included in the Common Database and National Lists (the “Catalogues”). Landraces cannot easily be registered – as they are populations and non-homogeneous varieties - so AEGILOPS’s representatives consider that the European Organic Agriculture leaves out biodiversity in organic farms. The farmers are also obliged to apply for a derogation to use their farm saved (organically produced) seeds which is (officially) considered as non organic and not registered. Organic farmers cannot use their seeds nor seeds from landraces. Wheat growers of heritage varieties face additional problems with premiums for hard wheat. In order to receive the premium they reveal false labels of registered varieties.

## Conclusions

| STRENGTHS | WEAKNESSES |
|---|---|
| Experience in organic farming and PGR preservation;<br>Scientific and farming skills;<br>Grassroots movement and community support;<br>Participatory activities. | Funding;<br>Lack of clear visibility in terms of promotion through the media of the work and activity carried out. |
| **OPPORTUNITIES** | **THREATS** |
| European biodiversity and organic farming movement;<br>National strategy for PGR with the participation of NGOs and the community in general;<br>Improvements in the interest of the community and the environment science. | GMOs;<br>TTIP;<br>Patents on life, any legislation against human (farmer's) rights and biodiversity. |

AEGILOPS builds on participatory approaches, networking and local communication to further disseminate its objectives and activities. When this approach proves to be efficient, the lack of overall recognition in the media limits the development of activities. By not being present enough in the media, the development of AEGILOPS's activities are concrete but limited. Progress is observed but it is slow.

AEGILOPS has established a strong relationship with the research sector, and this approach seems to be satisfactory. The results of the ongoing 4 year research programme clearly demonstrates the good dynamic that has been established between farmers and researchers in a well-recognised participative approach.

The NGO is also associated to other Greek, European, and international activities that bring additional knowledge on how to progress on these agro-biodiversity issues, participative breeding, organic breeding, etc. These networks are of key importance for the development of AEGILOPS.

Funding is a main issue that puts at risk the sustainability of the whole programme. Several legislations also limit the development of landraces in the country (seed marketing directives, GMO legislations and issues related to the patenting of traits and native genes in plants).

## Annex 1 – List of interviewees

- Mary Nathanailidou, President of AEGILOPS
- Kostas Koutis, AEGILOPS Crop Coordinator
- Alexanders Scaramagna, AEGILOPS member

## Annex 2 – List of references

Koutis K, Mavromatis, Baxevanos D & Koutsika – Sotiriou M (2012): Multienvironmental evaluation of wheat landraces by GGE Biplot Analysis for organic breeding. Agricultural Sciences 3, No. 1, 66-74.

Papadopoulos I, Papathanasiou F, Vakali C, Kazoglou Y & Tamoutsidis E (2010): Local Landraces of Dry Beans (Phaseolus vulgaris L.): a Valuable Resource for Organic Production in Greece. Acta Hort. (ISHS) 933, 75-81.

Reidsma P, Tekelenburg T, van den Berg, M & Alkemade, R (2006): Impacts of land-use change on biodiversity: An assessment of agricultural biodiversity in the European Union Agriculture. Ecosystems and Environment 114, 86– 102.

AEGILOPS-Website: www.aegilops.gr

http://www.unesco.org/culture/ich/doc/src/NGO-90123-ICH-09.pdf